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BULGARIAN ACADEMY OF SCIENCES

ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ

ИНСТИТУТ ЗА ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ НА БЪЛГАРСКАТА АКАДЕМИЯ НА НАУКИТЕ

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CONTENTS

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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FOREIGN DIRECT INVESTMENTS AND ECONOMIC GROWTH IN BULGARIA: THEORETICAL CHALLENGES AND EMPIRICAL RESULTS

The assessment of the strength and direction of the link between foreign direct investments (FDIs) and economic growth has long been the focus of research activities, but empirical findings remain mixed. Most results, however, show that the overall effect of FDIs is positively related to growth and vice versa. At the same time, it is widely argued that the impact of FDIs is closely related to the so-called 'absorptive capacity' of the host economy, with the highest weight being the quantity and quality of the workforce; the degree of trade openness and economic freedom; the fiscal policy pursued and the degree of financial development. These are key factors for the effectiveness of foreign direct investment, which in turn further stimulate economic growth. The present study provides an overview of the basic theoretical concepts and empirical assessment of the impact of FDIs on the rate of economic growth in Bulgaria, taking into account other factors of growth as well. Quarterly data for the period 1990 Q1-2019 Q3 were used for this purpose. Relevant conclusions and recommendations are made regarding the economic policy pursued.
JEL: F21; F23

1. Introduction

The transition period[2] is over, but its study will certainly continue for a long time as many questions remain unanswered. One of them is about the role of FDIs[3] and the extent to which the future development of the economy depends on incoming financial flows. Significant international trade liberalization has taken place during the transition years, and a large volume of FDIs flows has been attracted, necessitating a more in-depth analysis of their importance for long-term growth. Figure 1 illustrates the correlation between GDP

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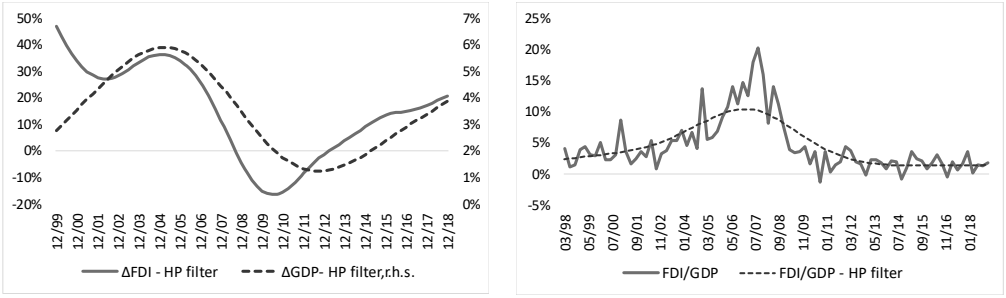
[2] Understood as a transition from centrally planned to market economy, including the building of all accompanying institutions.

[3] FDIs mean investments that involve long-term relationships and reflect a lasting investor interest. FDIs are usually seen as a composite package of funding, technology and know-how.

and FDIs growth rates. Ever since the beginning of the transition period, it can be seen that the share of foreign direct investments in GDP has a gradual upward trend, which has continued up until 2007-2008, after which a significant and steady decline has been recorded. It should be mentioned though, that repatriation of capital, exported from the country just before and at the beginning of economic reforms, may have played a substantial role for the high volumes of attracted foreign investments, especially in the pre-accession period, which explains (at least in part) the subsequent rapid decline. On the other hand, the decline of FDIs in both absolute and relative terms, which began at the end of 2007, was further exacerbated by the worsening global financial crisis, which negative effects were felt in Bulgaria starting in early 2009.

Figure 1

GDP and FDI*



* Quarterly data, seasonally adjusted by the Hodrick – Prescott (HP) filter, $\lambda = 1600$

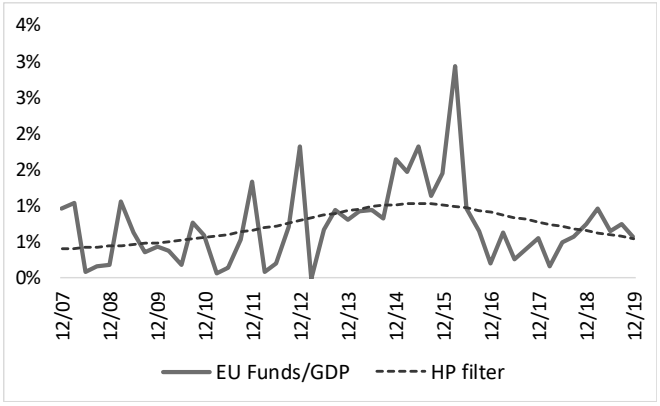
Source: BNB, MoF.

It can be seen as well that the reduced volume of FDIs in the economy had a negative impact on economic growth rates. EU funds (Figure 2) were not able to compensate for the sharp decline in FDIs. Consequently, economic growth rates declined from 5-6% in the 2002-2008 period to about 3% after that.

While Figure 1 does outline the link between incoming financial flows and economic growth rates, this link needs to be analyzed and evaluated in detail. This is essentially the main objective of the study, with various econometric techniques applied to its implementation. The working hypothesis is that there is empirical evidence of a statistically significant positive effect of FDIs on growth. In addition, internal factors and the absorptive capacity of the economy should also play a role. The structure of the remaining of the research is as follows: review of the literature on the topic; clarification of the theoretical approaches; a description of the methodology and data used; building and testing of various econometric models; analysis of the results obtained and drawing conclusions.

Figure 2

EU Funds share in GDP



Source: BNB, MoF

2. A Review of Literature

International financial flows are an important feature of global economy, and FDIs are perhaps their central component. Most countries, especially developing ones, are attracting FDIs to accelerate long-term economic growth with a view to increasing the well-being of the population. There are several reasons that make FDIs attractive – access to modern technology; creation of new knowledge and skills; increasing the importance of research and development (R&D) and know-how for the host country. These intangible assets are definitely beneficial to the host countries and stimulate productivity, and hence economic growth. FDI can also help accessing foreign markets, especially when the host country is used as an export platform for distribution.

Various theories of economic growth generally agree on the understanding that the high growth rate requires high levels of investments. In general, investments are provided by internal sources that are directly dependent on the economy's savings rate. When it is not high enough, an accelerated economic growth rate is still possible, provided that the country is able to attract foreign investments, and especially FDIs. Although rapid GDP growth is possible using internal resources only, such cases are extremely rare, especially in less developed countries. Much more common is the case when high growth rates are associated with an inflow (in one form or another) of external savings. On the other hand, globalization and developments in information technology have facilitated the mobilization of capital beyond national borders, which places an additional burden on the allocation of FDIs. However, economists' association with this view is rather conditional and is questioned by a wide range of studies. Although much of the theoretical literature has postulated that FDIs inflows do have benefits for the receiving country, studies by (Herzer, Klasen, 2008) and (Gorg, Greenaway, 2004) have shown quite controversial results. Similar are the results in the studies of (Irandoust & Ericsson, 2001) and (Carkovic, Levine,

2005), where no statistically significant relationship between FDIs and economic growth can be found.

Given the disparities in the empirical results of a number of academic papers, it is of particular importance to trace both the factors that lead to changes in FDIs volumes and changes in the absorption capacity of the host economy that may enhance (or reduce) the effect of FDIs. In this regard, the study of (Azman-Saini, et al., 2010), which states that there is a minimum threshold level of financial development necessary for the positive effect of FDIs on growth, is of particular interest.

Regarding the importance of the development of the financial system in absorbing foreign direct investments, it should be noted that pioneering research in this area was made by (Schumpeter, 1911 (1934)). Later, Schumpeter's ideas were further developed in the works of a number of researchers – for example (Shahbaz & Rahman, 2012) and (Alfaro, et al., 2004), who stated that the financial channel operates by reallocating resources from traditional sectors to growth-stimulating sectors due to FDIs inflows. Another channel of influence may be through easing credit constraints and / or by lower interest rates. In the works of (Lucas, 1993) and (Romer, 1986) one can also find an argument that a well-developed financial system attracts more foreign investment and contributes to reducing the asymmetry of information, which in turn has a positive effect on the allocation of resources, and indirectly on economic growth.

Theoretically, FDIs should affect economic growth mainly through the accumulation of capital and inclusion in the production process of new materials and technologies that lead to higher productivity and correspondingly higher output. The empirical evidence, however, is not straightforward. On the one hand, (Findlay, 1978) shows that the benefits of FDIs, viewed as technology transfer; know-how; introducing new processes and training employees, are much stronger and more visible in the industrial sector of the economy, than in the extractive industry and agriculture. This, in practice, means that both the structure of the host economy itself and the structure of foreign direct investments should be added to the absorptive capacity of the economy. Obviously, in the absence of the necessary conditions, foreign investments will have limited effect.

Studies on the role of FDIs inflows and their impact on the economy have good traditions in Bulgaria. First publications in this area appeared in the mid-1990s. These studies were somewhat descriptive, focusing primarily on the need of pursuing active policies to attract foreign investments rather than on focusing on the effects on economic development. With the accumulation of sufficient amount of empirical data, more studies began to emerge, for example (Petranov, 2003), which were using quantitative assessment methods and tried to model both factors influencing FDIs inflows, and the effects on the economy. At a later stage, new publications appeared, focusing on specific effects of FDIs's inflows: for example: on the effects on income inequality (Mihailova, 2014); on the effects on unemployment (Nikolaev, Stancheva, 2013); on the effects on financial and corporate governance (Nikolova, 2014); on the effects on the transmission mechanism and economic growth (Petrova, 2018). There are already publications summarizing and evaluating policies over a longer period (Mihailova, 2019), or fully focused on the search for econometric interdependencies (Petkov, 2016).

As a summary of the brief literature review, several important conclusions can be drawn:

- Most of the studies on the impact of FDIs on economic growth show a positive effect on the host economy. Moreover, the positive effect is seen as a function of the absorptive capacity of the host country – mainly the quality and quantity of the available human and physical capital. It should also be noted that there are studies, pointing at potential chances for zero, and even negative effects of incoming FDIs flows. Even though such studies are rather few, they should be taken into account while careful consideration should be given to factors that may trigger those adverse effects.
- Another important finding relates to considerations that affect investors when choosing where to allocate FDIs. To a certain extent, this depends on the level of economic development. When investing in developed economies, the overarching aim is to gain access to markets, while investments in less developed countries are explained either by lower production costs or by securing access to scarce resources. In fact, this means that links between FDIs and growth will vary from country to country and depend on the stage of development.
- The review of literature also reveals the most important factors to consider when examining the relationship between FDIs and economic growth. They can be organized as follows:
  - Size of the economy
  - Human capital – quantity and quality
  - Economic freedom
  - Development of the financial system
  - Price of labour
  - Tax system
  - Institutional quality
  - Trading mode
  - The risks in the economy

3. Theoretical foundations

The relationship between FDIs and economic growth has been the subject of research for decades, but the topic remains debatable. In recent years, there has been a growing interest, which can be explained by the ongoing processes of globalization and the fact that multinational companies play an increasingly important role in capital formation, trade and economic growth. This said, economic growth is a complex phenomenon that is influenced by both economic and institutional factors, and directions of causation between growth and various explanatory factors are often two-way. Moreover, the numerous factors that explain growth are generally correlated, suggesting that there is multicollinearity that must be

approached carefully in the process of econometric analysis. Such considerations play an important role in the empirical research. These contemplations are manifested through different channels: *first*, FDIs inflows can affect the capital formation, which is one of the main determinants of economic growth. *Second*, incoming FDIs can increase the overall factor productivity of the host economy and alter its comparative advantages. At the same time, if productivity growth is directly related to the export structure of the economy, then FDIs will affect both growth and export volumes. *Third*, the institutional characteristics of the host economy, such as its legal and tax systems; the quality of the institutions; compliance with property rights laws, etc., affect both the volume of attracted FDIs and the subsequent capital formation.

Going back to theory, in ***neoclassical growth models*** of a Solow-Swan type, FDIs have traditionally been seen as a supplement to the host economy's capital stock. Thus, there are no significant differences between domestic and foreign capital, i.e. their impact on growth will be the same and will be influenced by the law on diminishing return on capital. In other words, FDIs will have a short-term impact on growth only. In addition, the neoclassical theory of economic growth assumes that FDIs have an effect on GDP per capita ($\frac{Y_t}{POP_t}$) only, and not on economic growth $\frac{Y_t - Y_{t-1}}{Y_{t-1}}$ itself. However, current theories of economic growth accept that FDIs affect both per capita production and GDP directly. This view is well reasoned in (Irandoust, 2010).

In ***endogenous growth models***, the potential role of FDIs is greater as they examine more channels (not just through capital formation) through which FDIs influence growth. One way to make sense of this approach is by looking at how FDIs influences every argument in the production function. From this point of view, FDIs can influence production by raising capital, as mentioned above, but this impact is likely to be rather low, given the high degree of substitution between growth factors. The empirical results of this assumption are quite mixed (see for example Constantinos, Schmitt, 2016), and it is essential to check whether foreign and domestic capital are complementary or there is crowding-out. In fact, whether the ultimate effect of FDIs will be positive and significant depends largely on that.

3.1. Positive effects of FDI inflows

As already mentioned, in neoclassical models, long-term growth can only be the result of exogenous technological advances and/or growth in labour. From this point of view, FDIs can influence economic growth if it is transformed into technological progress. In endogenous growth theories, FDIs affect growth rates through two channels: directly, through greater investment and more efficient technologies; and indirectly, by improving human capital, infrastructure, institutions etc. Positive effects of FDIs can also be manifested in the form of management skills, organizational know-how and training of the workforce.

Even though the logic behind these models is broadly clear and beyond doubt, yet empirical results of some of the studies are puzzling. For example (Razin & Sadka, 2007) draw

attention to the fact that while theoretical models postulate an inverse relationship between the effect of FDIs on growth and the gap between the technological capacity of the investor and the host country, it turns out that close to ¾ of the global investments are made between developed countries and not between developed and developing countries. At the same time, FDIs are often in the form of specific investment in a specific sector, especially when it comes to privatization. As much as direct investments are directed towards privatization rather than towards the creation of new capacity and/or production, the effect on the whole economy is far from certain. One of the main constraints is that privatization (especially through FDIs) is almost always linked to a reduction in the number of employees of the privatized company, which, under other things, will most likely have a negative effect on economic activity.

3.2. Negative effects of FDI inflows

As noted above, studies showing a lack or even a negative relationship between FDIs and growth are not uncommon, which requires theoretical reflection. A possible channel may be the result of market mechanism distortions due to an aggressive policy to attract foreign investors. For example, (Easterly, 1993) notes that some policies, such as preferential tax treatment and other discounts, can distort incentives and repel potential domestic investors. More generally, if foreign firms are treated more favourably than local firms, long-term effects on growth will likely be negative. Another important observation was made by (Borensztein, et al., 1988), who stated that if FDIs enter an economy to overcome, or circumvent existing trade barriers, the volume and structure of these flows will not be associated with a higher long-term efficiency, instead it will just be driven by short-term incentives to maximize profits. Similar are the findings of (Balasubramanyam, et al., 1996) who argue that the infusion of human capital and new technologies into an economy, that is in a state of persistent imbalances and distortions, will neither accelerate the growth, nor may affect the production function. The whole effect will be offset by the redistribution of income in favour of certain new agents.

Other studies have argued that there are situations in which foreign direct investments can oust domestic investment by diverting scarce resources from other productive sectors. For example (de Mello, 1999) empirically proves that substitution between capital stock embodying old (local) and new (foreign) technologies is higher in developed than in developing economies.

In addition to the above, the size of the public sector and the government can also be a conduit for adverse effects on growth. The government may be asked to make major infrastructure investments in order to attract foreign direct investment. However, this can increase the budget deficit and/or external debt and lead (at a later stage) to a higher tax burden, which is a prime example of crowding out local investors in favour of foreign ones.

3.3. A simple theoretical model describing the relationship between FDI and growth

Based on the review of literature, as well as the theoretical background, a simple model can be constructed, on the basis of which a specific model can be drawn up. Figure 3 illustrates a concept underlying the process of data mining. Economic growth is a function of investments (capital) – both domestic and foreign; human capital; other factors such as labour costs, institutions and government policy, financial development, legal and tax systems, etc.

Figure 3

Relationships between FDI and Economic Growth

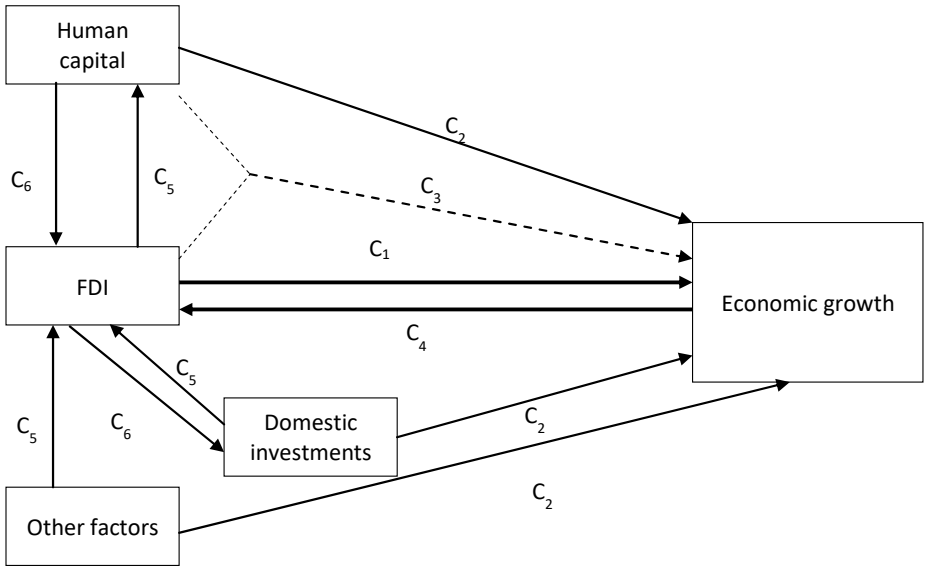


Figure 3 also shows that FDIs have a direct effect on growth, represented by C1. Other growth factors are represented by C2. In addition to direct effects, foreign direct investments could have an impact on economic growth through the human capital channel in combination with other resources represented by C3. The feedbacks in the model are represented by C4, C5 and C6, which can essentially be treated as determinants of the inward volumes of FDIs. The focus of this study is on channels C1, C2 and C3.

4. Methodology and Data

Based on the basic model, an econometric one can be constructed, which will help produce specific estimates. The approach assumed in this study is to evaluate the effects of FDIs on growth using two sets of information: theoretical literature and previous empirical studies.

Figure 3 suggests modelling the direct effects of FDIs on growth (C1), the effects of other engines of economic growth (C2), and the impact of the interaction between FDIs and other types of capital (C3). On this basis, equation (1) is drawn up, which follows from the review of the existing literature on the effects of FDIs on economic growth, controlling for the effects of other explanatory variables and the effects of FDIs interactions on the accumulation of other capital.

$$Growth_t = \alpha + \beta_1 FDI_t + \beta_2 FDI_t * HC_t + \beta_3^i Z_t + \varepsilon_t \quad (1)$$

where Growtht is the growth rate of real per capita GDP; FDI_t is the share of FDI in GDP; $FDI_t \times HC_t$ is a multiplicative term for the interaction between FDIs and other factors; Z_t is a vector of control variables and ε_t is the error term. The selection of elements from the control vector of variables is guided by the theoretical and existing empirical literature.

This study uses the autoregressive distributed lag (ARDL) approach, introduced by (Pesaran, Shin, & Smith, 2001), to test for a long-run equilibrium relationship between economic growth, FDIs, and other factors of economic development. The choice of this method is explained by its applicability regardless of the degree of integration of the variables – they can be either I(0) or I(1), or a combination of the two. In fact, this means that it is not absolutely necessary to include variables only of the same order of integration. The ARDL approach allows for relatively more accurate estimates in smaller samples – a problem that is common in calculations for a developing economy with frequent structural changes. Moreover, in the case where all variables are stationary at their first differences, I(1), then when estimating the long-term relationship, it is not necessary to increase the number of regressors to correct the residual autocorrelation.

In general, the ARDL approach can be characterized as a two-phased. The first phase consists of two steps. Firstly, we test for a short-term relationship between variables. The second step is to test for the presence of a cointegration vector. In the presence of a cointegration vector, we may proceed to the second phase, which is to reduce the model by testing for the optimal number of lags and to estimate the coefficients of the long-term relations.

To make it clearer, if the equation has only one explanatory variable, it can be written as:

$$y_t = \alpha + \beta x_t + \varepsilon_t \quad (2)$$

where Y_t and X_t are respectively the dependent and explanatory variable (for example GDP per capita and the size of FDIs), α and β are the coefficients to be estimated, and ε_t is the error term. The ARDL model (p, q) derived from the above equation would have the following form:

$$\Delta y_t = \beta_0 + \sum_{i=1}^{p} \beta_{1i} \Delta y_{t-i} + \sum_{j=0}^{q} \beta_{2j} \Delta x_{t-j} + \lambda_1 y_{t-1} + \lambda_2 x_{t-1} + \varepsilon_t \quad (3)$$

where the first half of the equation, in which coefficients β are to be estimated, represents the short-term relationship between the dependent and explanatory variables, and the second half of the equation, where coefficients λ are to be estimated, represents the long-term relationship. The estimation of coefficients is performed at different lags (p, q), keeping in mind the possible occurrence of problems with autocorrelation.

As mentioned, the second step is testing for a long-term relationship, which is established by testing the null hypothesis H0: $\lambda 1 = \lambda 2 = 0$. If the null hypothesis is rejected, we move on to the second phase by choosing the optimal ARDL model, i.e. selecting the optimum lag length and estimating the coefficients of long-term and short-term relations. The latter is done on the basis of equation (3)[4], which also sets the corrective mechanism, in other words, the speed at which the deviations from the long-term equilibrium are being corrected.

4.1. Specification of the model

To model and estimate the impact of FDIs on economic growth, we start from building a functional equation (4):

$$Y = f(FDI, FD, INV, GE, LF, FDI * FD) \quad (4)$$

where Y is real GDP per capita; FDIs is foreign direct investments (inflows, % of GDP); FD is a composite variable representing the level of financial development; INV is domestic investments (gross capital formation, % of GDP); GE government spending (final consumption, % of GDP); LF is the labour force. Based on the functional equation (4), an econometric equation (5) can be formulated, in which α is the constant term, β_i are the coefficients to be estimated, and ε_t is the error term. All variables are in logarithm.

$$LY_t = \alpha + \beta_1 LFDI_t + \beta_2 LFD_t + \beta_3 LINV_t + \beta_4 GE_t + \beta_5 LLF_t + \beta_6 (LFDI_t * LFD_t) + \varepsilon_t \quad (5)$$

With respect to the financial development variable (FD), the PCA[5] approach, as described in (Ang, McKibbin, 2007) is used, which implies the construction of a composite variable

[4] Equation (3) is only an example and includes only one variable. The specific calculations are further based on equations (5).

[5] Principal Component Analysis (PCA) is a statistical procedure that uses a special transformation to transform a set of observations of possibly correlated variables into a set of linearly uncorrelated variable(s), called "Principal Component(s)".

comprising of different components. The benefits of using this approach are twofold: firstly, since there are various financial development variables which tend to be highly correlated, the use of PCA helps to overcome the problem of multicollinearity; secondly, assessing the link between financial development and economic growth is hampered by the fact that there is no consensus among researchers as which single indicator should be used. The use of PCAs makes it possible to overcome this shortcoming by combining different variables relevant to financial development into one variable. In this case, the following variables are included in the procedure:

- Broad money to nominal GDP ($\frac{M3_t}{Y_t}$);
- Domestic credit to nominal GDP ($\frac{DC_t}{Y_t}$);
- Bank assets to nominal GDP ($\frac{BA_t}{Y_t}$)

The application of PCA approach is summarized in Table 1.

Table 1

Principal component analysis regarding financial development

Principal Components Analysis
Sample (adjusted): 1998Q4 2019Q3
Included observations: 84 after adjustments

Eigenvalues: (Sum = 3, Average = 1)

Number	Value	Difference	Proportion	Cumulative Value	Cumulative Proportion
1	2.866459	2.740446	0.9555	2.866459	0.9555
2	0.126013	0.118485	0.0420	2.992472	0.9975
3	0.007528	---	0.0025	3.000000	1.0000

Eigenvectors (loadings):

Variable	PC 1	PC 2	PC 3
Bank Assets/GDP	0.588905	-0.090400	-0.803130
Dom. Credit/GDP	0.574011	-0.652767	0.494376
M3/GDP	0.568948	0.752146	0.332527

Ordinary correlations:

	A_GDP	DCR/GDP	M2/GDP
Bank Assets/GDP	1.000000		
Domestic Credit/GDP	0.973419	1.000000	
M3/GDP	0.949848	0.875504	1.000000

4.2. Order of integration of the variables

All the variables in equation (5) are tested for the order of integration (presence of a unit root) using ADF (Augmented Dickey-Fuller) and PP (Phillips-Perron) tests from the econometric package EViews 10. The results are shown in Table 2.

Table 2

Stationarity at levels

	Augmented Dickey-Fuller (AD) F test			Phillips – Perron (PP) test		
	Optimal lag (AIC)	t – stat.	Critical value at 1%	Newey-West Bandwidth	Adj. t – stat	Critical value at 1%
LY	3	-2.0176	-4.072	5	-2.094	-4.068
LFDI	0	-3.516	-3.510	4	-3.279	-3.510
LFD	0	-1.516	-4.068	4	-1.353	-4.068
LINV	9	-2.068	-4.081	6	-2.829	-4.068
LGE	2	-1.661	-3.510	3	-3.287	-3.508
LLF	2	-2.347	-3.510	3	-1.147	-3.508
LFDI*LFD	0	-3.688	-3.510	3	-3.437	-3.510

When using the ADF test, the Akaike Info Criterion (AIC) was used to determine the optimal number of lags, and the PP test used the Newey-West Bandwidth criterion. As expected, the variables are not stationary in terms of their levels, which requires repeating the test, but in terms of the first differences of the variables.

Table 3

Stationarity at first differences

	Augmented Dickey-Fuller (AD) F test			Phillips – Perron (PP) test		
	Optimal lag (AIC)	t – stat.	Critical value at 1%	Newey-West Bandwidth	Adj. t – stat	Critical value at 1%
ΔLY	3	-3.542	-3.512	5	-9.574	-3.509
ΔLFDI	1	-9.207	-3.514	8	-15.006	-3.512
ΔLFD	0	-10.235	-3.509	3	-10.182	-3.509
ΔLINV[6]	8	-2.098	-3.517	4	-4.804	-3.509
ΔLGE	2	-7.960	-3.511	3	-17.075	-3.509
ΔLLF	1	-2.535	-3.510	3	-3.450	-3.509
Δ(LFDI*LFD)	1	-9.217	-3.514	4	-14.438	-3.512

Table 3 shows that except for the LF variable (workforce), all other variables are integrated of order one – I(1). From the point of view of constructing and estimating the ARDL model, this is not crucial[7], as there may be a mix of I(0) and I(1) variables, but it is important in selecting the critical values of F-statistics when testing the hypothesis of a long-term relationship between economic growth (the dependent variable) and the various explanatory variables.

[6] The ADF test for the variable INV (investment) shows the non-stationarity of the first differences and the stationarity under the PP test. An additional Kwiatkowski-Phillips-Schmidt-Shin test was performed to confirm the stationarity at first differences.

[7] In fact, it matters because in order to build and estimate an ARDL model, no variable should be I(2). When constructing the final model, this feature will be considered and the labor variable (LF) will be excluded from the final model.

4.3. Building a full ARDL

After completing the required stationarity tests, and if there are no I (2) variables, the construction of an ARDL model can proceed. Provided that cointegration is detected, an error-correction ARDL model can be built as well. When specifying the model, an important challenge is the correct determination of the lag-length. The econometric literature states that when quarterly data are used, it is advisable to start the tests with 4 lags, which may subsequently be reduced. There are various diagnostic tests to help determine the optimal lag structure more accurately. As a rule of thumb, one should look for the most compact model possible. Based on these tests, the maximum lag value for both the dependent and variable explanatory variables is set to ($p = q = 4$).

When looking for a long-term relation, using an ARDL model, it is essential that the parameters are estimated based on the complete model, i.e. without any restriction on individual variables. Following the methodology proposed by (Banerjee, Dolado, Galbraith, & Hendry, 1993), by means of simple linear transformations equation (5), which in practice is a vector autoregressive model (VAR), can be rewritten as follows:

$$\begin{aligned}\Delta LY_t = {} & \beta_0 + \sum_{i=1}^{p}\beta_{1i}\Delta LY_{t-i} + \sum_{j=1}^{q}\beta_{2j}\Delta LFDI_{t-j} + \sum_{j=1}^{q}\beta_{3j}\Delta LFD_{t-j} + \\ & \sum_{j=1}^{q}\beta_{4j}\Delta LINV_{t-j} + \\ & \sum_{j=1}^{q}\beta_{5j}\Delta LGE_{t-j} + \sum_{j=1}^{q}\beta_{6j}\Delta\left(LFDI_{t-j} * LFD_{t-j}\right) + \lambda_1 LY_{t-1} + \lambda_2 LFDI_{t-1} + \\ & \lambda_3 LFD_{t-1} + \lambda_4 LINV_{t-1} + \lambda_5 LGE_{t-1} + \lambda_6 LFDI_{t-1} * LFD_{t-1} + \varepsilon_t\end{aligned} \quad (6)$$

According to the theory outlined above, coefficients β set the short-term relationship and the coefficients λ set the long-term relationship. Equation (6), in which $p = q = 4$, is estimated by the ordinary least square (OLS) method. The results of the evaluation of the full model are shown in the following Table 4:

Table 4

Coefficients of the full ARDL model (ARDL 4,4,4,4,4,4)

Method: ARDL
Sample (adjusted): 2000Q1 2019Q3
Included observations: 73 after adjustments
Dependent lags: 4 (Fixed)
Dynamic regressors (4 lags, fixed): DLFDI D(LGE) D(LINV) D(LFD) D(LFDI*LFD)
Fixed regressors: LY (-1) LFDI (-1) LGE(-1) LINV(-1) LFD(-1) LFDI*LFD(-1) C

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Δ(LY(-1))	-0.266465	0.128579	-2.072387	0.0453
Δ(LY(-2))	-0.075930	0.148537	-0.511185	0.6123
Δ(LY(-3))	-0.175730	0.146749	-1.197485	0.2387
Δ(LY(-4))	-0.249451	0.120112	-2.076810	0.0448
ΔLFDI	-0.031695	0.064337	-0.492638	0.6252
Δ(LFDI(-1))	-0.096102	0.104219	-0.922115	0.3624

Method: ARDL
Sample (adjusted): 2000Q1 2019Q3
Included observations: 73 after adjustments
Dependent lags: 4 (Fixed)
Dynamic regressors (4 lags, fixed): DLFDI D(LGE) D(LINV) D(LFD) D(LFDI*LFD)
Fixed regressors: LY (-1) LFDI (-1) LGE(-1) LINV(-1) LFD(-1) LFDI*LFD(-1) C

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Δ(LFDI(-2))	-0.104174	0.085541	-1.217822	0.2310
Δ(LFDI(-3))	-0.111461	0.073192	-1.522857	0.1363
Δ(LFDI(-4))	0.005698	0.060909	0.093552	0.9260
Δ(LGE)	-0.026077	0.029584	-0.881462	0.3838
Δ(LGE(-1))	-0.058761	0.059463	-0.988192	0.3295
Δ(LGE(-2))	-0.054402	0.054345	-1.001039	0.3233
Δ(LGE(-3))	0.004137	0.047479	0.087128	0.9310
Δ(LGE(-4))	0.013155	0.036387	0.361526	0.7198
Δ(LINV)	-0.028222	0.065944	-0.427974	0.6712
Δ(LINV(-1))	0.050767	0.065016	0.780839	0.4399
Δ(LINV(-2))	0.107142	0.059531	1.799761	0.0801
Δ(LINV(-3))	-0.019635	0.062325	-0.315035	0.7545
Δ(LINV(-4))	-0.086121	0.054335	-1.585010	0.1215
Δ(LFD)	-0.102926	0.077207	-1.333109	0.1906
Δ(LFD(-1))	-0.190655	0.108614	-1.755346	0.0875
Δ(LFD(-2))	-0.103389	0.094956	-1.088814	0.2833
Δ(LFD(-3))	-0.138791	0.078918	-1.758680	0.0869
Δ(LFD(-4))	-0.013856	0.060402	-0.229390	0.8198
Δ(LFDI*LFD)	0.006023	0.011349	0.530670	0.5988
Δ(LFDI*LFD(-1))	0.015134	0.018478	0.819057	0.4180
Δ(LFDI*LFD(-2))	0.017166	0.015113	1.135852	0.2633
Δ(LFDI*LFD(-3))	0.018629	0.012897	1.444474	0.1570
Δ(LFDI*LFD(-4))	-0.001367	0.010720	-0.127509	0.8992
LY(-1)	-0.105806	0.063964	-1.654161	0.1066
LFDI(-1)	0.232707	0.111440	2.088177	0.0437
LGE(-1)	-0.025275	0.064890	-0.389501	0.6991
LINV(-1)	-0.122012	0.043266	-2.820031	0.0077
LFD(-1)	0.131651	0.059414	2.215812	0.0329
LFDI*LFD(-1)	-0.037505	0.019943	-1.880622	0.0679
C	0.740130	0.532634	1.389564	0.1730

R-squared	0.740376	Mean dependent var	0.011752
Adjusted R-squared	0.494786	S.D. dependent var	0.013049
S.E. of regression	0.009275	Akaike info criterion	-6.216196
Sum squared residuals	0.003183	Schwarz criterion	-5.086654
Log likelihood	262.8911	Hannan-Quinn criterion	-5.766054
F-statistic	3.014678	Durbin-Watson stat	1.545306
Prob(F-statistic)	0.000625		

4.4. Reducing the full model and inclusion of an error-correction term

Following the usual diagnostic tests on residuals (normality and serial correlation), the hypothesis for co-integration between the variables is tested. As mentioned above, the null hypothesis is H0: $\lambda1 = \lambda2 = \lambda3 = \lambda4 = \lambda5 = \lambda6 = 0$. Its confirmation (or rejection) is based on the estimated equation (6), imposing a restriction on the coefficients λ1… … .. λ6 according to the null hypothesis. Wald's F-statistic values are compared with the upper and lower bounds of pre-calculated critical values.[8] If the F-statistic does not fall between the upper and lower bounds, a conclusion can be drawn regarding the presence or not of cointegration. When the value of the F-statistic is greater than the upper limit, the null hypothesis is rejected, signalling for the presence of a long-term relationship. When the value of the F-statistics is less than the lower bound, the null hypothesis cannot be rejected. When the value of the F-statistics falls between the lower and upper bounds, neither the null hypothesis nor the null hypothesis can be definitively rejected or confirmed. In addition, the econometric product EViews 10 offers an additional cointegration test that does not need to compare the results of the Wald test with pre-calculated values and the results are shown directly. Table 5 presents the results of the F-statistics of the Wald test and those of EViews 10.

Table 5

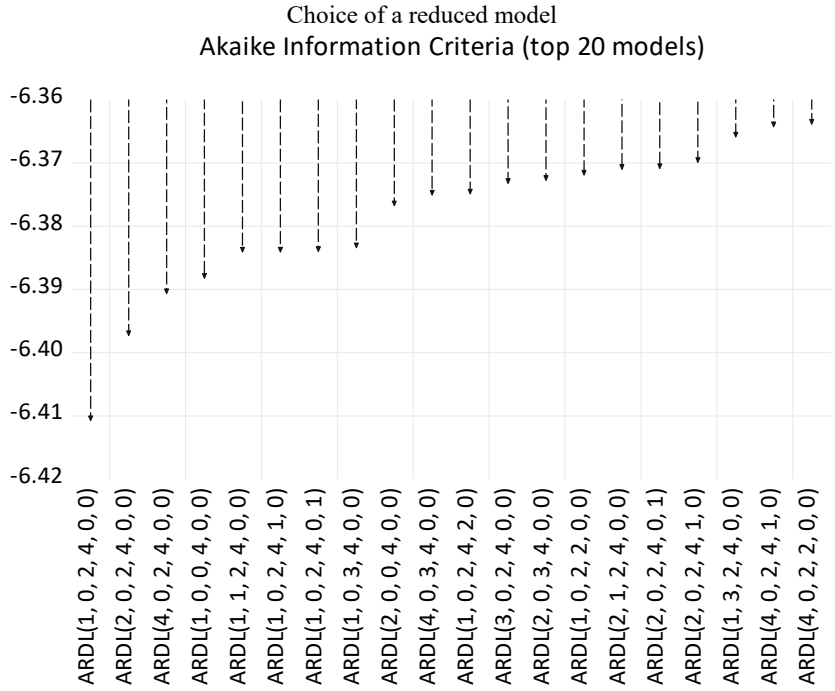
Co-integration tests

Null hypothesis	Wald test		F-Bounds Test			T-Bounds Test		
$H_0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = \lambda_6 = 0$	F-stat.	Prob.	F-stat	Lower bound I(0)	Upper bound I(1)	T-stat	Lower bound I(0)	Upper bound I(1)
	2.436	0.0438	6.661	2.26	3.35	-6.735	-2.57	-3.86

Results presented in Table 5 strongly reject the null hypothesis, which implies the presence of a cointegration relation between the variables. This allows for additional work on equation (6) to further reducing it, as well as including a supplementary variable in the form of an error-correction term, i.e. the deviation from the long-term trend. Again, diagnostic tests are used to determine the optimal lag-length in the reduced model. The selection was made based on maximizing the value of the Akaike Information Criterion (AIC), with the results shown in Figure 4.

[8] The critical values calculated by (Narayan, 2004) and (Pesaran & Shin, 1999) are used in this study.

Figure 4



According to the tests performed, the full ARDL (4,4,4,4,4,4) model can be reduced to an ARDL (1,0,2,4,0,0), and the reduced equation is as follows:

$$\Delta LY = \beta_{11}\Delta LY_{-1} + \beta_{21}\Delta LFDI + \beta_{31}\Delta GE + \beta_{32}\Delta GE_{-1} + \beta_{33}\Delta GE_{-2} + \beta_{41}\Delta LINV + \beta_{42}\Delta LINV_{-1} + \beta_{43}\Delta LINV_{-2} + \beta_{44}\Delta LINV_{-3} + \beta_{45}\Delta LINV_{-4} + \beta_{51}\Delta LFD + \beta_{61}\Delta LFDI*LFD + \lambda_1 LY_{-1} + \lambda_2 LFDI_{-1} + \lambda_3 GE_{-1} + \lambda_4 LINV_{-1} + \lambda_5 LFD_{-1} + \lambda_6 LFDI*LFD_{-1} + \varepsilon \quad (7)$$

The results of the estimation of equation (7) are shown in Table 6.

The final step of the analysis is to include in equation (7) an error-correction term (ECT). The meaning of this variable is to show how short-term fluctuations from the long-term trend are being dealt with. This said, it's paramount that the coefficient of the ECT is negative, otherwise the model will not converge to its long-term equilibrium. As already underlined, the inclusion of such a variable is only possible in the presence of a cointegration vector that has been established. It should also be recalled that the size of the ECT is indicative for the speed of convergence – the greater the value, the faster the short-term deviations will return to equilibrium.

Table 6

Coefficients of the reduced model (ARDL 1,0,2,4,0,0)

Dependent Variable: ΔLY
Method: ARDL
Sample (adjusted): 1999Q2 2019Q3
Included observations: 80 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): Δ(LFDI) Δ(LGE) Δ(LINV) Δ(LFD) Δ(LFDI*LFD)
Fixed regressors: LY(-1) LFDI(-1) LGE(-1) LINV(-1) LFD(-1)LFDI*LFD(-1) C
Number of models evaluated: 12500
Selected Model: ARDL (1, 0, 2, 4, 0, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*	
Δ(D1(-1))	-0.138261	0.097913	-1.412072	0.1630	Short-term coefficients
Δ(LFDI)	-0.032901	0.056189	-0.585543	0.5603	
Δ(LGE)	-0.026911	0.029783	-0.903571	0.3698	
Δ (LGE (-1))	-0.126521	0.040595	-3.116633	0.0028	
Δ (LGE (-2))	-0.102149	0.032815	-3.112892	0.0028	
Δ(LINV)	-0.100275	0.065924	-1.521079	0.1334	
Δ (LINV (-1))	-0.051187	0.055408	-0.923823	0.3592	
Δ (LINV (-2))	-0.016238	0.049861	-0.325663	0.7458	
Δ (LINV (-3))	0.151962	0.050364	3.017296	0.0037	
Δ (LINV (-4))	-0.150105	0.050964	-2.945334	0.0046	
Δ(LFD)	-0.042963	0.045232	-0.949830	0.3459	
Δ(LFDI*LFD)	0.006000	0.009881	0.607237	0.5459	
LY (-1)	-0.098461	0.037663	-2.614244	0.0112	Long-term coefficients
LFDI (-1)	0.131466	0.059664	2.203422	0.0314	
LGE (-1)	0.023320	0.049990	0.466500	0.6425	
LINV (-1)	-0.042434	0.021253	-1.996554	0.0503	
LFD (-1)	0.105317	0.028949	3.637974	0.0006	
LFDI*LFD (-1)	-0.021919	0.010644	-2.059309	0.0437	
C	0.387558	0.376662	1.028928	0.3076	

R-squared	0.568039	Mean dependent var	0.010240
Adjusted R-squared	0.440575	S.D. dependent var	0.015124
S.E. of regression	0.011312	Akaike info criterion	-5.922117
Sum squared residuals	0.007805	Schwarz criterion	-5.356385
Log likelihood	255.8847	Hannan-Quinn criterion	-5.695299
F-statistic	4.456470	Durbin-Watson stat	2.060228
Prob(F-statistic)	0.000006		

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Table 7

Coefficients of the reduced model with an ECT

ARDL Error Correction Regression
Dependent Variable: D(ΔLY,2)
Selected Model: ARDL (1, 0, 2, 4, 0, 0)
Case 3: Unrestricted Constant and No Trend
Sample: 1998Q4 2019Q3
Included observations: 80

ECM Regression
Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C	0.387558	0.334453	1.158782	0.2511	
Δ (LGE,2)	-0.026911	0.023402	-1.149940	0.2547	Short-term coefficients
Δ (LGE (-1),2)	0.102149	0.019211	5.317317	0.0000	
Δ (LINV,2)	-0.100275	0.041456	-2.418816	0.0186	
Δ (LINV (-1),2)	0.014381	0.040866	0.351910	0.7261	
Δ (LINV (-2),2)	-0.001857	0.038966	-0.047652	0.9621	
Δ (LINV (-3),2)	0.150105	0.036879	4.070233	0.0001	
LY (-1)	-0.098461	0.033908	-2.903799	0.0051	Long-term coefficients
LFDI (-1)	0.131466	0.041375	3.177441	0.0023	
LGE (-1)	0.023320	0.043089	0.541218	0.5903	
LINV (-1)	-0.042434	0.016544	-2.564850	0.0128	
LFD (-1)	0.105317	0.024836	4.240481	0.0001	
LFDI*LFD (-1)	-0.021919	0.007405	-2.959938	0.0044	
ECT	-1.138261	0.087841	-12.95825	0.0000	

R-squared	0.779460	Mean dependent var	0.000336
Adjusted R-squared	0.736020	S.D. dependent var	0.021166
S.E. of regression	0.010875	Akaike info criterion	-6.047117
Sum squared residuals	0.007805	Schwarz criterion	-5.630262
Log-likelihood	255.8847	Hannan-Quinn criterion	-5.879988
F-statistic	17.94349	Durbin-Watson stat	2.060228
Prob(F-statistic)	0.000000		

As can be seen from

Table **7**, there is no change in the long-term coefficients compared to the reduced model, but overall the model is much better and meets the parsimonious requirements.

4.5. Diagnosis of coefficients, residuals and stability of the model

In order to establish the reliability of the model, the necessary tests were performed. The results are as follows:

4.5.1. Test for serial correlation of residuals

Table 8

Serial correlation of residuals

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 4 lags

F-statistic	1.475812	Prob. F (4,57)	0.2215
Obs*R-squared	7.507719	Prob. Chi-Square(4)	0.1114

The null hypothesis is that there is no serial correlation and as Table 8 shows, this hypothesis cannot be rejected as Prob. F-statistic> 0.05.

4.5.2. Histogram-Normality test

Figure 5

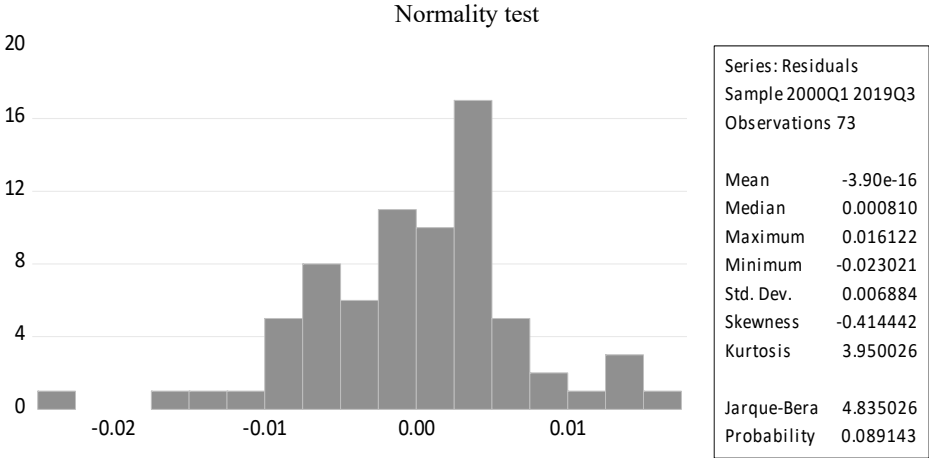


Figure 5, in particular the Jarque-Bera value, verifies the normal distribution of residues.

4.5.3. Heteroskedasticity test

Table 9

Heteroskedasticity test

Heteroskedasticity Test: Harvey Null hypothesis: Homoskedasticity			
F-statistic	1.250280	Prob. F(18,61)	0.2530
Obs*R-squared	21.56042	Prob. Chi-Square(18)	0.2521
Scaled explained SS	32.29083	Prob. Chi-Square(18)	0.0203

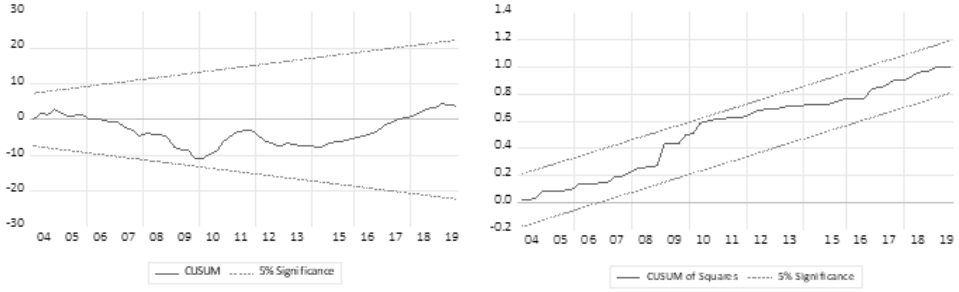
Table 9confirms that the null hypothesis of residual homoskedasticity cannot be rejected as Prob. of the F-statistic is significantly higher than 0.05.

4.5.4. Stability of the model

The CUSUM tests are based on the cumulative sum of the recursive residuals, or their square values. These tests plot the cumulative sum together with the 5% critical lines. The tests find parameter or variance instability if the cumulative sums go outside the area between the two critical lines. Figure 6 shows that both the value of CUSUM and its squares lie entirely within the confidence interval.

Figure 6

Stability tests



4.6. Building a VAR model and Implementing an Impulse-Response analysis

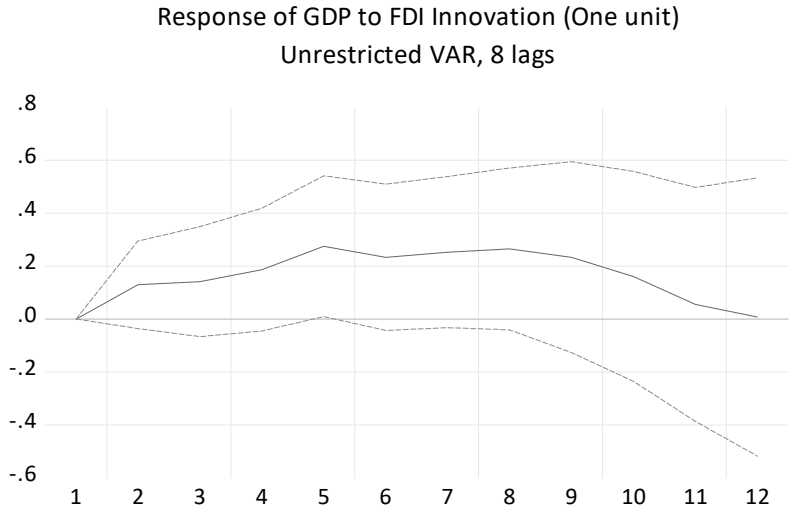
In addition to the estimates based on an ARDL model, we also apply the vector autoregression (VAR) approach. Typical for this econometric approach is that it does not seek causality and specific channels of influence, but is e entirely endogenous, in the sense that the variables included can be both dependent and explanatory. In this type of research, which usually uses multifactor analysis combined with multiple lags, there is no serious economic explanation for the coefficients, but it does have the potential of tracking

potential effects in the presence of some shock, i.e. the so called "impulse response function".

In building a VAR model, we use the levels of the same variables, as in the ARDL model, taken in logarithmic form. Performed lag-length tests show that it is optimal to use 8 lags in the unrestricted specification of the model. Given that, as mentioned before, there is no economic sense in interpreting coefficients in a VAR model with 6 variables and 8 lags (there are 294 coefficient altogether), we are interested only in the impulse response function of a shock to FDIs inflows to GDP growth rates.

Figure 7

Impact of FDIs shocks on GDP growth



5. Evaluation of results and conclusions

The purpose of this empirical study was to estimate the effect of FDIs on economic growth and to explore the channels through which it occurs. The main conclusion is that FDIs do have a positive long-term effect on growth rates. The effect is statistically significant, but it is rather weak. This allows to conclude that ***FDIs are not a significant factor for economic growth in Bulgaria***. In addition, data in Table 7 also lead to the conclusion that the absorptive capacity of the economy is low and does not allow for full use of attracted FDIs.

It should be noted that Figure 7 shows results that broadly correspond to the results of the ARDL model, as presented in Table 7. The effect of FDIs on economic growth appears to be positive but weak. The long-run coefficient is just 0.13, which means that an increase in FDIs inflows (as a share of GDP) by 1 pp. will accelerate long-term growth by 0.13 pp. The

VAR specification, and the impulse response function, in particular, show that a possible shock, in the sense of a rise in FDIs by one unit (1 pp), leads to an increase in GDP, which reaches a maximum value of 0.26 pp. in the fifth quarter after the onset of the shock, and then gradually subsides and completely disappears after the third year.

The inclusion of a variable on the interaction between FDIs and the development of the financial sector improves the model (as t-stat is high), but somewhat surprisingly, the coefficient has a negative sign, indicating a reversed relationship. The theoretical expectation is that the value should be positive. The explanation is most likely related to the specific nature of monetary policy, which is subject to restrictions coming from the currency board arrangement. The peculiarities of the currency board make it possible to pursue a "quasi-monetary policy", implemented through changes in BNB's monetary liabilities. In fact, BNB's monetary liabilities are far from being influenced by movements in the reserve money only, as implied by an orthodox currency board. They include many more items, including government deposits, and thus changes in these items may affect money supply with no corresponding links to official foreign reserves. This practically hinders the automaticity of the currency board, which implies an immediate change in the money supply depending on the change in official foreign currency reserves. Consequently, when FDIs inflows tend to decrease, this could not be compensated by the usual instruments of monetary policy; hence the composite variable reflecting financial development may well be negative.

Overall, the test results of the various models are consistent with the idea that FDIs inflows, accompanied by relevant technologies, skills and know-how, can only increase the growth rate of the host economy by interacting with the economy's absorbing capacity. At the same time, the results obtained raise two important questions:

- Are FDIs more effective than domestic investments?
- Is there a crowding-out effect between FDIs and local investments?

It must be acknowledged that the specification of the models is not intended to answer these questions directly. However, some indirect conclusions can be drawn from the results presented in Table 6 and Table 7. To examine the possibility of higher FDIs efficiency, we test whether FDIs have effects higher than those of aggregate investments in the growth equations.

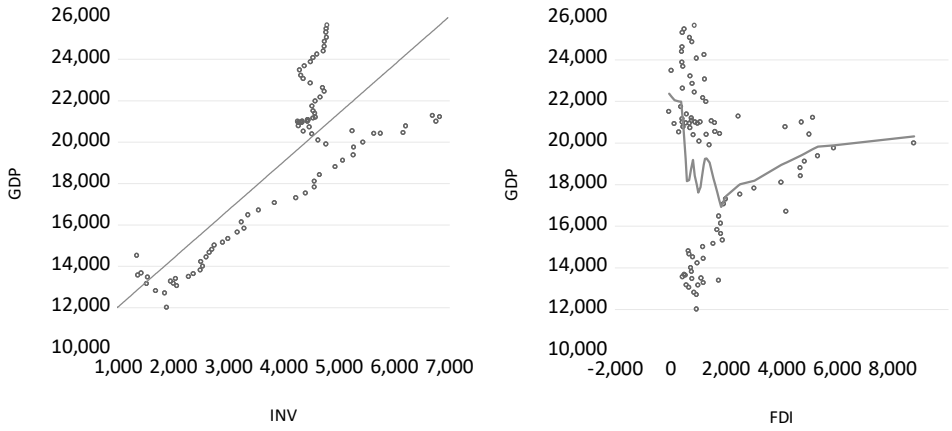
To further explore the contribution of FDIs to economic growth, we analyze its relationship to total investments. The theoretical hypothesis is that FDIs can add economic growth simply by increasing the accumulation of capital in the host economy. This will require FDIs not to crowd-out investments from local sources from competing in the product or financial markets, but to complement them.

Figure 8 shows that, overall, domestic investments are more sustainable than foreign ones, with its relationship to GDP rather linear, while FDIs are definitely not linear. Even visually, it can be seen that when there was a strong inflow of FDIs, domestic investment slowed down. This is also supported by the negative sign of the long-term ratio. Although

the value of the coefficient is very low, its statistical significance is high and should not be neglected. This leads to the conclusion that FDIs are fast to transform into economic growth but are more fragile. Moreover, Figure 7 shows that the effect is not constant but fades away relatively quickly. This can be interpreted in a sense that ***foreign investments are more effective, but only in the short term***. This finding has a logical explanation. For example, it is clear that local businesses have better knowledge and access to domestic markets. If a foreign company chooses to enter the market, it must offset the advantages enjoyed by local firms. In practice, this means that in order to succeed, a foreign company is likely to have lower costs and higher productivity than its domestic competitors, at least in the first years after the investment. This is even more true in developing countries, where higher FDI efficiency is combined with sophisticated management skills and the introduction of advanced technologies. ***At the same time, the data show that FDIs tend to crowd out local investments rather than complement them. This conclusion again emphasizes the adverse impact of the low absorptive capacity of the economy.***

Figure 8

GDP, FDI and INV



The present study confronts the understanding that FDIs have an undeniable and necessarily great positive effect on the economy of the host country. It follows that there are no economically justifiable actions on the part of the Government aimed at creating privileged conditions for foreign investors at any cost. It should be made clear that this does not mean that more foreign investment repulsion policies should be applied. This finding is limited to the fact that any active action to attract foreign investors (especially large ones) must be well thought out because the positive short-term effects can be quickly replaced by the long-term negative ones. ***Another important finding is that in order to maximize the effect of FDIs, absorptive capacity of the economy (human capital, financial development and institutions) should be given priority. This will not only improve the current macroeconomic characteristics of the economy but will also help to better absorb any future financial flows.***

6. Concluding remarks

Assessments and conclusions made in this study must be approached with caution, especially as regards the interpretation of the magnitude of the effect of foreign direct investment on economic growth. The estimation methods used rely on linear dependencies, which are not always true in real life, at least at certain times. This inevitably distorts the assessments and the conclusions drawn accordingly. Another reason to be cautious is the fact that the FDI data used in the study measures flows as recorded in the balance of payments. We must admit that these are only part of the funds that foreign companies invest, as part of the investment can be financed through debt or equity. Things are even more complicated when the investment is not a "greenfield" one, and especially in cases where there is involvement with local companies. In these cases, highlighting the effect of direct investment is difficult, if not impossible. In such cases, the assessment of the effect of FDI can be seriously overestimated.

Rather, the results of this study should be considered as a starting point for further research. The results support the view that the beneficial effect of FDI on growth is due, in the first place, to higher efficiency rather than simply greater capital accumulation. This implies future studies to test the effect of FDI on the dynamics of overall factor productivity in the host economy. In addition, given the theoretically defined link between human capital and FDI, it may be interesting to study the impact of FDI on the level of human capital.

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
ECONOMIC STUDIES

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OPTIMIZATION OF CORPORATE PROFIT TAXATION IN THE CONTEXT OF STIMULATING THEIR INVESTMENT ACTIVITY: THE CASE OF UKRAINE

The article describes various methods of tax optimization in the implementation of corporate tax management of a business entity, in particular mechanisms for reducing the tax base, using tax breaks, and a special tax regime, changing the place of registration of taxpayers.
The methodology of economic and mathematical modelling was used to optimize the tax burden of a business entity by balancing between the part of corporate income tax (investment tax credit), that an enterprise should use for investing, and the part paid to the budget.
The developed economic-mathematical model of determining the proportion of «investment tax credit» entity has two objective functions – maximum value of the entity's profit and maximum of the accrued taxes sum. The offered economic-mathematical model will allow to define effective strategies of management of enterprise's profit and demonstrate advantages of preferential taxation for activation of investment activity of the enterprise.
JEL: C02; H25; H32; G30

In the conditions of an unstable external economic environment, the issue of finding mechanisms for optimizing tax burden is becoming increasingly pressing for business entities. The level of the tax burden in Ukraine indicates that business entities should give a significant portion of their profit to the state.

The tax burden "washes away" a large share of working capital of an enterprise, thereby reducing its financial stability and paying capacity, depriving it of the financial resources necessary for extended reproduction.

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Issue of the tax burden optimization for the taxpayers was deeply researched by Arthur Laffer already in the 1970s of the twentieth century. According to the scientist's conclusion, the negative impact of the tax burden on the investment activity of business entities causes a decrease in the state tax revenues in the future, as the state's attempts to maximize the tax rate lead to an increase in taxpayers' resistance and ultimately the amount of tax revenues of the state are decreasing (Blankart, 2000).

In modern financial science, the taxation research line and in particular, the economic content of the tax burden have been actively developing. Here are some definitions of this notion.

Sokolovska A. (2006) equates the concept of tax load and tax burden and defines it as an influence of taxation on the economic system as a whole and on the taxpayers; as a combination of economic constraints that arise as a result of tax payments and transfer of the free funds to the budget, instead of other possible ways of their use by the business entities.

According to the authors (Reed & Rogers, 2006), the tax burden is the fraction of resources spent on payment of the taxes on the personal income of economic entities.

US economist Joseph Stiglitz (1998) provides an excellent definition of the tax burden in his work «Public Sector Economy» and argues that the term «tax burden» is used by scientists and experts to identify the number of individuals who actually carry a tax burden regardless of the circle of taxpayers, who are defined by law. Thus, the aim of the tax burden research is to determine the actual «tax burden-bearer» and tax liability.

The term "tax incidence" is widely used in English literature. In the paper, authored by G. Metcalf & D. Fullerton (2002), tax incidence is defined as an analysis of the taxation role in the distribution of wealth in the economic system and the search for a tax burden bearer.

This research begins with the analysis of taxes transferring process, when the payer, who is legally obliged to pay a specific tax, does not necessarily pay it and is, in fact, not a taxpayer.

Modern financial science also distinguishes between the notions of «tax limit» and "tax burden".

The boundary of economic entities taxation is a fixed upper limit of economic entities and individuals' tax deductions that enable the implementation of the fiscal policy of the state and stimulation of innovative, scientific, technical, investment and production activities in all spheres of the state economy.

The upper limit of tax deductions could not be the same for different states with first-rate organization of financial systems. Such a limit is connected with differences and peculiarities of the historical socio-economic development of the state. Scientists and experts agree that the level of upper limit deductions to the budgets is relatively higher in unitary states with smaller territory than in the states with a federal system, that are territorially larger and more differentiated by the level of socio-cultural development (Malyshkin, 2015).

The tax burden, unlike the tax limit, is characteristic of the general functioning of the tax system in the state, which shows how the level of tax rates and the amount of tax payments influence the financial status of the taxpayers or the economic system as a whole and provides a quantitative assessment of this impact (the size of tax payments, their share in GDP or the income of taxpayers) (Sokolovska, 2006).

Above mentioned differentiation of tax limit and tax burden consider these concepts at the macro level. At the micro-level, if to regard business entities as taxpayers, these concepts can be seen as identical, since they reflect the deduction of the entrepreneur's income share to the state budget.

The level of tax burden at the macro level, as indicated by (Tsymbaliuk, Vyshnevska, 2012), reflects the features of the state tax policy, as it allows to quantify the overall impact of the taxation system on the tax payments sources.

The main drawback of the tax burden level definition, according to the assessment of taxation systems experts in the EU countries, is that it does not allow calculating the level of taxation and burden on individual sectors of the economy and groups of taxpayers in a realistic way.

Bench N. (2008) defines the tax burden as a generalized economic category that designates the tax system sphere of influence and the totality of the effects of its impact on the economy, production factors and concrete payers.

In order to study the functioning of an entity with regard to various strategies for optimizing tax burden, the economic-mathematical modelling is used.

The application of economic-mathematical modelling for improving tax management is determined by the fact that this method allows us to analyze the behaviour of a business entity in relation to different management strategies and choose the best among them.

An economic-mathematical model means a concentrated expression of the most important economic interactions of the studied objects (processes) in the form of mathematical functions, inequalities and equations (Vitlinskyi, 2003).

The application of economic and mathematical modelling to the study of corporate tax management tasks varies considerably at macroeconomic (regional) and microeconomic levels.

Taking into account that the procedure for tax charges and tax payment is clearly stated in the documents, most researches devote their studies to the dynamics of tax charges and tax payment at the macroeconomic level.

In this case, econometric methods and models are usually used to research the correlation between different economic variables of the tax system.

According to V. Vitlinskyi et al. (2001), in order to predict tax revenue, it is necessary to look at the retrospective data on the return of taxes plans for the previous periods and the degree of their performance.

Within this approach, a set of models for predicting and planning tax revenues, taking into account tax risk, are built with the help of ARIMA and ARIMAS models (seasonal components are taken into consideration) (Tereshchenko, 2000).

Possibility of forecasting the volumes of tax revenues, taking into account the risk of under-execution of planned revenues, is the advantage of these models. The disadvantage of this approach is that the built models simply describe the dynamics of tax revenues without taking into account the underlying factors that predetermine the development of the tax system.

The research (Semerak, 2007) highlights the impact of taxation on an enterprise using the social welfare function and builds a model of the enterprise tax strategy choice using the "fuzzy logic" approach.

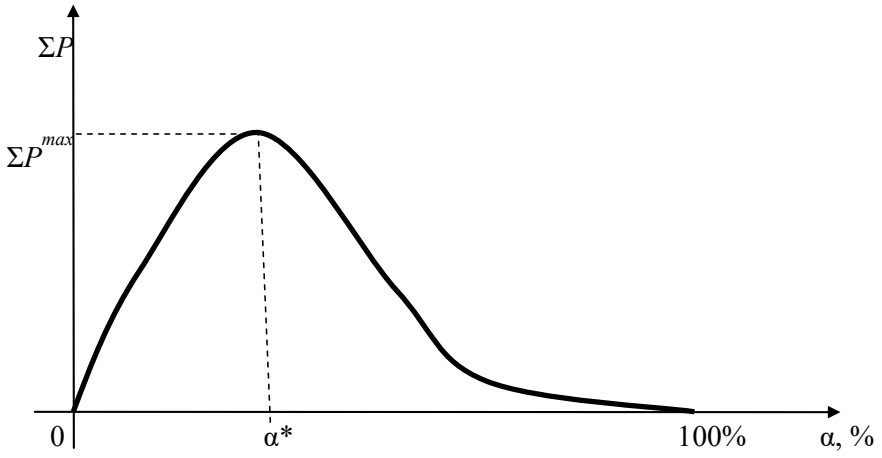
The organization of tax management is characterized by the interaction of the enterprise and the state. On the one hand, the authorities organize the tax process and determine the tax rates; on the other hand, the company accepts the rules of conduct when paying taxes and while assessing the corresponding amounts of taxes.

In this case, the tax rate affects the amount of taxes paid: when the tax rate increases to a certain level α *, the amount of tax accruals and paid taxes ΣP (the amount of budget revenues) increases, while further growth of the tax rate leads to a reduction in the amount of collected taxes due to the fact that it will be unprofitable for the company to carry out a legal activity (to make its activities "shadow") (Savchenko, 1999).

To determine the optimal size of the tax rate, various mechanisms are used, in particular the methodology of econometric modelling and the study of the relationship between economic variables. Laffer Curve describes this dependence (see Figure 1).

Figure 1

Dependence between the amount of the tax rate and the amount of budget revenues



At the microeconomic level, special attention is paid to the problems of choosing a tax system or alternatives to managing tax burdens; optimization of tax load management; assessment and analysis of the impact economic indicators make on the tax burden of an enterprise; estimating tax deductions; modelling the functioning of enterprises taking into account tax processes (Yastrebova, 2009).

One of the approaches to optimizing corporate tax management is the method of determining the break-even point, which allows for accurate estimation of critical volumes of production, taking into account the tax factor for the organization of break-even activity (Serdiuk, 2007).

In order to study the mechanism of the relationship between a taxpayer and the controlling bodies, it is also possible to use game techniques used in the analysis of conflict situations (Proskura, 2007). In this case, the search and analysis of effective taxpayer and tax inspector behaviour strategies are conducted. The impact of motivation and different accounting metrics used to evaluate CEO and chief executive officers performance for annual bonuses affect the level of corporate tax planning effectiveness is investigated by Phillips J. D. (2003); Powers, K., Robinson, J. R. & Stomberg, B. (2016).

When implementing corporate tax management, various methods of tax optimization are used at the microeconomic level, in particular, distinguishing between legal and illegal methods of reduction of tax liabilities, special methods of optimization (replacement of relations, distribution of relations, delayed tax payments, reduction of the legal tax unit, the offshore practice), the application of tax privileges and exemptions, etc. (Bryzhalin, 2000).

In practice, there is often a problem of establishing a line between tax optimization and tax evasion. Hanwen Chen, Daoguang Yang, Xinmin Zhang & Nan Zhou (2020) studied the role of internal control in tax avoidance by evaluating the efficacy of the COSO framework in tax risk management in China. Often tax evasion is associated with a low culture of the taxpayers. However, the main reason for tax evasion is the excess of the non-payment benefits compared to public goods that taxpayers receive from the state for paying taxes and fees. Even punishment for such illegal acts does not deter payers, since the size of the penalties is rather low compared to the tax evasion gain.

Tax evasion is manifested in shadow activities, concealment or substitution of the taxation object, non-submission of tax returns, implementation of false transactions, and the accounting violations of tax law.

Clear determination of the paying taxes procedure by economic entities is a peculiarity of modelling that represents the functioning of the tax sphere, namely, on the basis of primary documents and tax rates, the amount of taxes that they have to pay to the budget is determined. In case when the value of gross profit is shown, the calculation of the amount of the enterprise's profit tax is automatically carried out. On the basis of data on the total amount of accrued wages and rewards for the work performed (services rendered), the amount of the single social contribution (payroll tax) and personal income tax (wage arrears) are accrued. The basis for the calculation of value-added tax are the primary documents on the means of production flow, etc.

When implementing corporate tax management, different methods of tax optimization can be applied. In this case, the methods of optimizing the tax burden are mainly mechanisms of reducing the tax base, the use of tax breaks, the use of a special tax regime, and taxpayer's place of registration change (see Table 1).

Table 1

Classification of tax optimization methods

Method	Meaning of the method
Methods of optimizing the tax burden without changing the structure of the taxes that should be paid	
The tax base reduction	Manipulation with prices, cost manipulation, change in the form and conditions of contractual relations, the formation of an appropriate accounting policy
Tax rate reduction	Organization of separate record of supplies that use different rates, creating conditions for the use of lower rates
Use of reduced payments and tax liabiliies	Using tax incentives provided by the legislation, change of activity for obtaining tax privileges
Changing the order and terms of taxes payment	Contract terms change, creating and using reserves, delaying payment of taxes
Methods of optimizing the tax burden by changing the structure of the taxes that should be paid	
Reduced list of taxes paid	Changing organizational and legal form, changing the status of a legal person or individual
Use of special tax regime	Simplified taxation system (fixed agricultural tax, single tax for small businesses of legal entities and individuals)
Changing the taxpayer's place of registration	Registration in an offshore foreign jurisdiction, registration in a free (special) economic zone within the country

Source: Compiled by the authors on the basis of Bukina, 2007 and Semenov, 2004.

To optimize the tax burden, business entities can use different strategies. One such strategy may be the balancing between the part of the corporate income tax (investment tax credit) that an enterprise should use for investing (acquisition of fixed assets, intangible assets, corporate rights and securities, upgrading of production), and the part of the corporate income that the enterprises should pay to the budget.

When choosing a method of tax optimization for the subjects of economic activity, it is necessary to conduct a detailed analysis of consequences that appear as a result of using a specific mechanism of tax policy and their impact on the dynamics of the enterprise.

An important consequence of the business entity tax policy (application of a particular method of optimizing the tax burden) is the formation of the tax history of the enterprise (in analogy to «credit history»), which, from the point of view of tax authorities, will determine the tendency of the entrepreneurial activity subject to illegal evasion (partial payment) of taxes and, as a result, will give rise to a detailed examination of its activities.

In today's economic environment, corporate income tax is one of the main taxes paid by entities, since it is the profit that is the main purpose of any business entity. Revenue is a source of enterprise asset updates and a source of investment in different projects, in particular, innovation projects. Unlike other direct taxes, this tax is paid by all legal entities, so the use of regulatory instruments in this direction will involve more entities. In addition

to income tax, businesses also pay value-added tax and excise taxes (indirect taxes), but the amounts of these taxes are almost completely transferred to the end consumer of the enterprise's products, so there is no direct tax pressure on the entity. For other compulsory payments, such as the payments to Social Security Fund, which accrue to the payroll, benefits for these payments are social and do not stimulate investment of enterprises.

How different ways of taxing capital income affect firms' investment and financial policies over their life cycle is researched by Andrés Erosa & Beatriz González (2019). Bishnu, M., Ghate, C. & Gopalakrishnan, P. (2016) studied why countries with different tax arrangements exhibit the same growth rate. The role of corporate tax planning in industry competition is examined by Armstrong C. S., Glaeser S. & Kepler J. D. (2019).

To optimize the tax burden, business entities can use different strategies. One such strategy may be the balancing between the share of the corporate income tax (so-called investment tax credit) that an enterprise should use for investing (acquisition of fixed assets, intangible assets, corporate rights and securities, modernization and upgrading of production), and the share that is paid to the budget.

Thus, a tax investment loan is one of the most widespread and most effective tools for stimulating investment and innovation activity. Most often, a tax investment loan is granted to business entities in the form of an income tax-deferred payment for a specified period in order to accumulate its investment capital for the implementation of innovative programs. The shortfall of the income in the budget is further compensated by expanding the tax base: increasing the income of taxpayers as a result of which the amount of income tax also increases (Peresada, Maiorova, 2002).

S. Mochernyi (2005) notes that ITC (investment tax credit) is a temporary deferred income tax payment used in order to increase the financial resources of an entity for the implementation of innovative projects. In essence, an investment tax credit is actually similar to the preferential tax on corporate profits.

The tax investment credit is so common due to the fact that it is profitable both for the state and for economic entities. The advantages of this tool for the state are (Matishchak, 2014):

1) increase in the competitiveness of the country's economy that is achieved through the introduction of new technologies, in particular, those that are aimed at saving the energy, through the upgrading of production capacities, which promotes employment, environmental protection and raises the standard of living in general;
2) increase in the production and sales volume through the growth of enterprises economic efficiency, which ensures the increase of tax revenues to the state budget due to increased turnover and profits of taxpayers;
3) increase of the wages level as a result of the demand for skilled labour, which will ensure the growth of taxes from the incomes of citizens.

From the entrepreneurial structures point of view, the thing that is important when using an investment tax credit is that it supports a positive investment environment and stimulates the financial and economic activity efficiency increase of business entities, since only enterprises that implement investment and innovation projects can apply for a tax credit.

The use of an investment tax credit has several advantages over the use of bank loans. Bank lending is carried out on the conditions of repayment and interest is fairly high, so the implementation of especially innovative investment projects at the expense of bank loans is complicated. Bank loan presupposes the availability of highly liquid mortgages, unlike investment tax credit, which does not take working capital or other highly liquid assets from the company's turnover (Maiorova, 2015).

In fact, the investment tax credit involves the investment resource potential of the company in the form of a profit (part of the profit, which should be directed to the budget as a tax on profit). Therefore, an investment tax credit stimulates entrepreneurs to increase their profitability level and investment activity.

In world practice, tax deductions are actively used to promote investment and innovation activities of the enterprises. Developed countries widely make use of investment tax credits to implement Research and Advanced Development.

The United States is the establisher and modern leader in the Research and Advanced Development in the corporate sector (one-third of the world's capacity). The country applies research tax credit and the so-called alternative incremental credit with a graduated rate that grows with increasing R&D expenditures (Nikiforov et al., 2009). In the United States, the value of an investment tax credit ranges from 6 to 10% of investment in equipment.

France is ranked the first among the OECD countries in terms of spending on research activities. Investment tax credit (pump-priming credit) charges 30% of research expenditures of up to 100 million euros and 5% of over 100 million euros.

Companies that were the first to apply for such a discount can get a credit of 50% during the first year and 40% during the second year (Avihdor, 2011). In 2000, England also introduced 150% R&D write-off expenses for small and medium-sized businesses and 125% for large enterprises (Nikiforov et al., 2009).

A similar mechanism of R&D tax incentives is also used in Spain: companies are allowed to deduct 100% of their R&D for the prime costs and they can get a loan of 30% of R&D costs, and if the sum of these costs exceeds average costs over the past two years, they can get 50% of the excess (Avihdor, 2011).

According to Hungarian legislation, tax incentives for innovation could be made by reducing taxes on company profits or through a tax credit. Such benefits can be obtained by any taxpayer who invests in innovative projects of over 100 million forints. Thus, the company can reduce its income tax by as much as 80% (Moldovan, 2013).

It should also be noted that, in many countries, favourable tax treatment depends on the size of the enterprise, in particular in Canada, Italy, Japan, the Netherlands and Denmark, small and medium-sized innovation enterprises receive more tax incentives (OECD, 2009).

In particular, in Japan, an enterprise has the right to deduct 7% volume of investments in equipment which is used for carrying out scientific research on the creation of new materials and electronic equipment from the income tax.

In general, the calculation of the tax investment credit base varies in different countries and depends on the objectives of such lending. In some countries (Japan, Denmark) a certain amount of investment in basic research is reimbursed and only these costs are taken into account while calculating the base. Often, this current base also includes other current R&D expenses.

In a number of countries (Canada, Spain, Korea, France, Italy) these costs or the cost of the main capital depreciation are added to the investment value of the main assets belonging to the R&D sector. In the Netherlands, a tax credit is granted on the basis of worker's wage involved in the implementation of R&D.

The tax policy of Ukraine is characterized by the fact that a fairly significant part of the profit of the national economy is deduced from the business entities in the form of a profit tax. Thus, the effective tax rate on income for most types of economic activity exceeds the nominal tax rate.

The corporate profit tax in Ukraine has become exclusively a fiscal instrument. Its regulatory potential is practically not used, and in today's economic conditions, this tool plays an important role in tax competition.

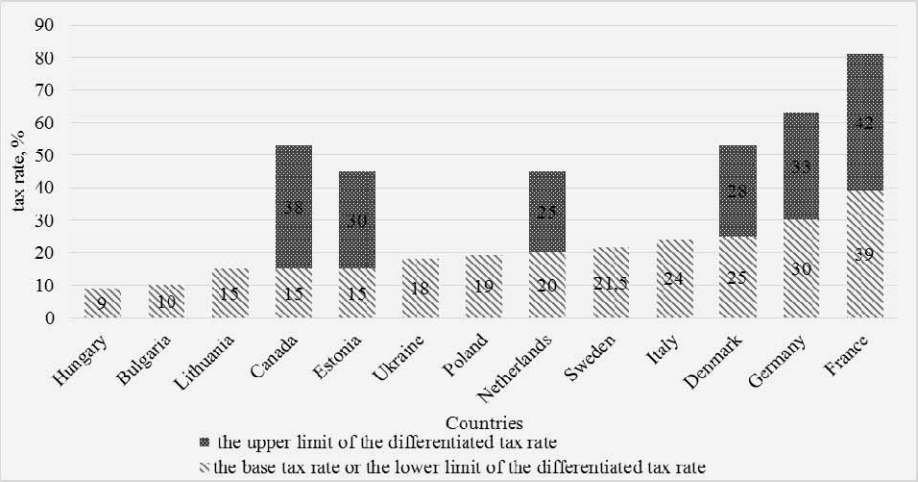
Thus, the nominal rate of corporate profit tax in Ukraine was 25% (valid until January 1, 2011), in comparison with similar rates in European countries at that time it was low; however, it created significant tax pressure on domestic enterprises. At that time, in the 2000s, global capital market trends showed a steady decline in corporation tax rates.

So, if in the early 2000s average income tax rate was 30-40% in the EU countries, then in the late 2000s its average level was within the range of 20-30%. (OECD, 2009) According to the world fiscal trends in Ukraine, with the adoption of the Tax Code, the profit tax rate is gradually decreasing. In particular, from April 1, 2011, the tax rate on income was 23%, from January 1, 2012 – 21%, from January 1, 2013 – 19%, from January 2014 and until 2019 – 18%. Business tax rates in different countries for comparison are shown in Figure 2.

As the chart shows, highly developed countries in the world (Germany, the Netherlands, Denmark, France, Canada) mainly use differentiated rates to tax corporate profits. The differentiation depends mainly on the size of the company turnover and the features of profit-sharing – reinvestment or consumption. Mid-tier countries have mainly a basic rate of income tax and an extensive system of rates for special-type operations. Low-income tax rates are observed in Bulgaria and Hungary – 10% and 9% respectively. The income tax rate in Ukraine is low compared to other countries. The basic corporate income tax rate in Ukraine is generally low compared to developed countries. However, the tax pressure on corporate profits due to the widespread use of tax benefits abroad is lower than in Ukraine. Business conditions, the mechanism of tax administration and the features of calculating the tax base are more complicated in Ukraine.

Figure 2

Enterprise (corporate tax) income tax rates in countries around the world



Source: Compiled by the authors on the basis of the source The World Bank, (2019).

The corporate income taxpayers in Ukraine are the legal entities listed in Table 2.

Table 2

Income taxpayers in Ukraine

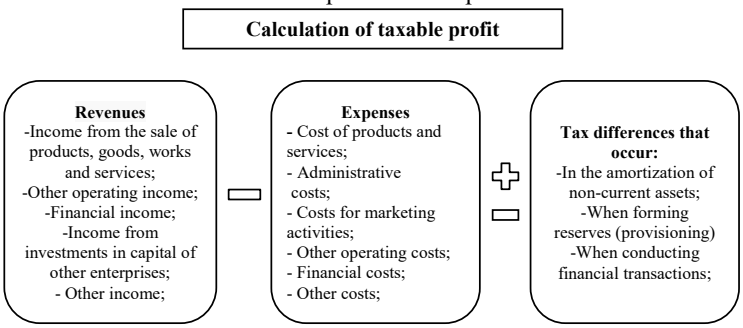
Residents	Non-residents
• business entities – legal entities that carry on business both in Ukraine and abroad, except: 1) public institutions; 2) public associations, political parties, religious, non-profit organizations, pension funds, charity founds, members of governing bodies, other related persons, as well as among employees of such organizations; 3) entities that apply a simplified system of taxation, accounting and reporting. • National Bank of Ukraine • managers of real estate operations funds	• permanent representative offices of non-residents who receive income with a source of origin from Ukraine or perform agency (representative) and other functions in relation to such non-residents or their founders • legal entities formed in any legal form and receiving income originating from Ukraine, except for institutions and organizations having diplomatic privileges or function with immunity under international treaties of Ukraine

Source: Compiled by the authors on the basis of the source Tax code of Ukraine (2010).

The object of taxation of this tax is taxable profit. That is calculated as shown on Figure 3.

Figure 3

Calculation of taxable profit of enterprises in Ukraine



Source: Compiled by the authors on the basis of the source Tax code of Ukraine. (2010).

To determine the amount of income tax, the object of taxation (taxable income) is multiplied by the tax rate.

In Ukraine, small and medium-sized businesses are taxed under a simplified system, paying a single tax. The operating conditions for taxation of small and medium-sized businesses are shown in Table 3.

Table 3

Single taxpayer groups in Ukraine

Single taxpayer groups	Tax rate
The first group is individuals-entrepreneur who do not hire labour force hired labour. They can only carry out retail sales of goods in the markets and/or carry out business activities for providing household services to the population. The entrepreneur's income does not exceed UAH 300,000 during the calendar year.	Tax rate – up to 10 percent of the subsistence level. The subsistence level is reviewed periodically. According to the state budget, in 2020 the subsistence minimum for one person per month is: from January 1, 2020 – UAH 2027, from July 1 – UAH 2118, since December 1 – UAH 2189.
The second group – individuals-entrepreneurs providing services and/or sale of goods, activities in the field of restaurant business. They operate without hired employees or the number of persons who are with them in employment, at the same time does not exceed 10 people, and their income does not exceed UAH 1,500,000 during the calendar year.	Tax rate – up to 20 percent of the minimum wage. The minimum wage is revised periodically. The minimum wage in Ukraine since January 1, 2020, is 4723 UAH per month or 28.31 UAH per hour.
The third group – entrepreneurs who operate without hired employees or the number of persons who are with them in employment are not limited and legal entities-entities of any legal form, in which the amount of income does not exceed UAH 5,000,000 during the calendar year.	The single tax rate is set as a percentage of the revenue received: 3% for VAT payers); 5% of VAT revenue for non-payers). VAT is 20%.
The fourth group – agricultural producers, whose share of agricultural production is equal to or exceeds 75% in the previous tax (reporting) year	The tax base is the monetary valuation of one hectare of agricultural land.

Source: Compiled by the authors on the basis of source Tax code of Ukraine. (2010).

We consider it is necessary to increase their annual income for small and medium-sized businesses. These volumes are critically small in today's business environment and macroeconomic conditions, in particular processes of inflation.

In general, the main tax incentives widely used in the United States, Canada, the United Kingdom and the European Union include:

1) The application of accelerated depreciation while maintaining full life and high depreciation rates in the early years. Depreciation payments in different countries have a different role in the investment processes of the enterprise: in some countries, they are the main source of investment, in others – they compensate for the renewal of individual fixed assets. Also interesting is the experience of using depreciation as an indirect tax incentive to stimulate investment in less developed economics regions or as an additional incentive for the development of priority industries. A rather specific tool that is used in developed countries is the depreciation charge for the acquisition of intellectual property. In Ukraine, the accelerated depreciation method can be applied to one of sixteen groups of fixed assets – machinery and equipment.

2) Direct reduction of profit, to which we aply tax by the full amount or by a limited fixed amount, or by the share of the expenses of the corporation's income, which are directed to the statutory investment goals and the implementation of research and development activities (tax investment credit described above).

In addition, the Code provided temporary taxation (before 2020) exemption for the certain types of economic activity. In particular, this has applied to the aircraft industry and the income of enterprises derived from the economic activity connected with gas (methane), coal deposits or electricity (Tax code of Ukraine, 2010).

3) Exemption from income tax on contributions to investment and reserve funds of companies, as well as income from the placement on the financial market of such assets.

4) Full or partial exemption from taxation of profits of new enterprises for a certain period on the criterion of priority development of the industry, support or development of the region, small or medium-sized businesses. In Ukraine, the legislation provides for tax breaks (zero-income tax payment) to small business entities whose annual income for the last annual reporting period does not exceed UAH 3 million and the amount of salary (income) accrued for each month each of the employees is not less than two minimum wages and in which the average number of employees is less than 50 (less than 20 for active enterprises that meet the rest of the requirements). Such criteria are very difficult to meet, as a new company with this amount of annual income is usually unable to pay each employee the salary required. Therefore, the opportunity to obtain such tax benefits is limited.

5) The possibility to choose between taxation of income received at the level of the business entity or taxation of derived capital. In Ukraine, there is a practice of double taxation of this income: first, the profit is taxed before it is distributed among the shareholders by the corporate income tax, then the dividends are taxed on the personal income tax.

6) Deferral and deferral of tax payment, which allows to increase sources of investment resources.

7) The proportion of corporations' gross expenditures as a proportion of representation expenses, a portion of employee social security expenses, and a portion of the cost of additional staff education.

These measures, under the favourable conditions of economic activity, and the existence of clear legally defined rules should gradually transform the profit tax into a regulatory-stimulating instrument for the development of production in Ukraine. However, the realities of economic life in Ukraine, in the particular shadow economy and corruption schemes, cast doubt on the effectiveness of such transformations.

One of the main relative indicators that calculate, when examining the effectiveness of the operation of certain taxes, or the tax system as a whole, is the tax burden. We calculate the non-income tax burden in two ways:

- As the ratio of corporate income tax revenues in the budget revenues to corporate profits as a direct tax base;
- As the ratio of revenues from the corporate income tax in the budget to the revenue from the sale of products as the main source of tax payment (Table 4).

Important indicators of the regulatory impact of corporate income tax are their investment activity. The table also shows data on capital investments made by Ukrainian enterprises.

Table 4

Tax burden on corporate income tax and investment activity enterprises in Ukraine

Years	Income tax burden,%	Tax burden on GRP,%	Total capital investment, UAH mln	Capital investments made at the expense of own funds of enterprises and organizations, UAH mln	Share of capital investments made from own funds of enterprise and organizations in the total capital investment structure,%
2011	21.42	1.37	241286.0	147569.6	0.61
2012	22.17	1.31	273256.0	171176.6	0.63
2013	25.58	1.33	249873.4	165786.7	0.66
2014	17.10	0.96	219419.9	154629.5	0.70
2015	8.97	0.67	273116.4	184351.3	0.67
2016	12.27	0.87	359216.1	248769.4	0.69
2017	11.28	0.87	448461.5	310061.7	0.69
2018	14.48	1.05	578726.4	409585.5	0.71

Source: compiled and calculated by the authors on the basis of the data of the State Statistics Service of Ukraine (2019).

At present, the capital source of enterprises and organizations is the main source of capital investment sources, the share of which in the overall structure over the last years has been steadily about 70% and shows a growing trend – in 2018 it was 71% and has increased by 10% in comparison with 2011. Thus, the opportunity to increase investment activity is

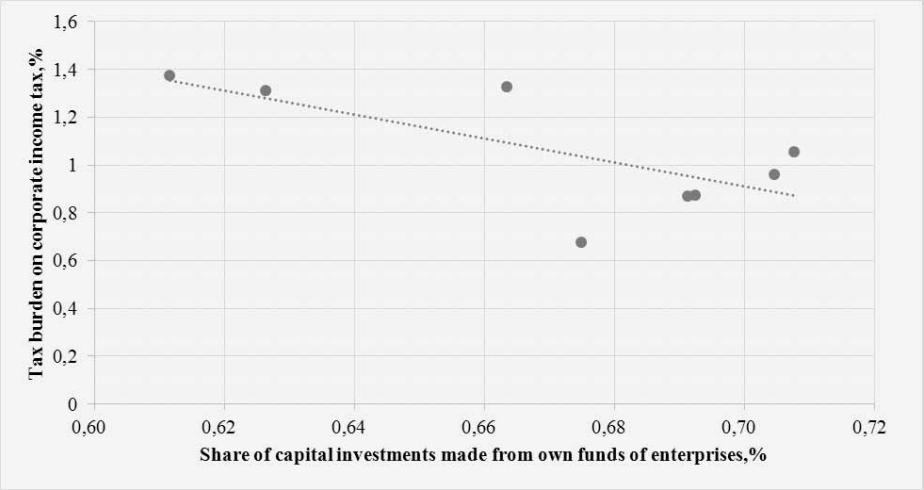
determined primarily by the financial condition of the enterprise, and to improve it requires appropriate government policy.

Correlation analysis of the tax burden on corporate income tax and the share of capital investments made at the expense of the own funds of enterprises showed that there is an inverse relationship – the correlation coefficient is -0.697 (Figure 4). This indicates that reducing the tax burden on enterprises leads to an increase in the share of capital investments made at the expense of the economic entities' own funds.

Thus, the state should focus on this interconnection and provide tax incentives aimed at intensifying investment processes in enterprises. There should also be tight control on the targeted use of these benefits with a well-developed system of penalties for violations.

Figure 4

The relationship between the tax burden on corporate income tax and the share of capital investment made from own funds of enterprises during 2011-2018



Source: Formed by the authors according to the data of the Ministry of Finance of Ukraine (2019) and the State Statistics Service of Ukraine (2019).

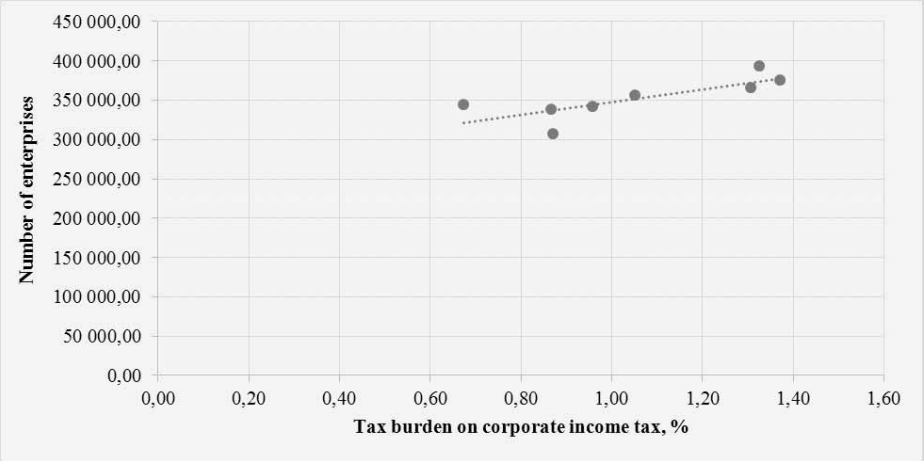
The above information on the incentives for corporate income tax benefits and the results of correlation analysis make it possible to conclude that the income tax is not used as a tool to stimulate investment activity of enterprises.

To study the impact of the tax burden on business activity, we conducted a correlation analysis of the tax burden and the number of enterprises. The results of the analysis showed that there is a close direct relationship between these values (R2 = +0,782) (Figure 5). Therefore, reducing the tax pressure on the activity of enterprises does not lead to an increase in their number, but rather to a decrease, which indicates the ineffectiveness of the application of tax benefits. In the opposite situation – increasing the tax burden leads to an

increase in the number of enterprises – we can talk about the problem of bogus enterprises mentioned above.

Figure 5

The impact of corporate income the tax burden on the number of enterprises in Ukraine during 2011-2018



Source: Formed by the authors according to the data of the Ministry of Finance of Ukraine (2019) and the State Statistics Service of Ukraine (2019).

The results of the study confirm the inefficient use of the regulatory potential of corporate income tax in Ukraine.

In our opinion, in order to shade economic processes in business and improve the efficiency of the corporate income tax system, it is first of all necessary to achieve stability in the tax field, in particular, to significantly reduce the frequency of changes in tax legislation. In addition, the taxation of enterprises should focus on incentives, rather than social benefits, with criteria that are adequate to domestic realities, and ensure transparency of their provision and efficiency of use.

At present, modernization of the main production assets of Ukrainian business entities demands particular attention, taking into account the task of increasing the energy preservation, introducing energy-saving technologies, reducing the product energy consumption and increasing its competitiveness in conditions of integration into the world economic space.

In this case, it is advisable to suggest a strategy for the modernization of domestic business entities through the partial utilization of the company investment income tax. Using this strategy, the profit before tax should be divided into two parts:

1) profit that is taxed under the general scheme and is used for different purposes: financing company's logistic development, financing own working capital growth,

formation of financial reserve, repayment of long-term and medium-term bank loans, implementation of social development and personnel encouragement, payment of dividends to the owners of the enterprise, etc.;

2) profit taxed under the preferential scheme that is used for the development of company's logistics (investments).

It is worth noting that in developed countries, the share of tax investment credit in covering the cost of investment and innovation activities is 10-30%, and the rest of it (70-90%) are own and borrowed funds of business entities. In this case, the profit taxed under the preferential scheme and the investment tax credit lead to an additional increase in profit for the entity's profit during a certain period. To study the growth of profits at the expense of an investment tax credit, it is expedient to use a distributed-lag model:

$$\Delta P_t = f\left(ITC_t, ITC_{t-1}, ..., ITC_{t-\tau}, \varepsilon\right) \quad (1)$$

Where ΔP_t denotes enterprise's profit increase for the period of time *t*; ITC_t denotes amount of the investment tax credit for a certain period of time *t*; $ITC_{t-1}...,ITC_{t-\tau}$ stand for lag variables that characterize the amount of the delayed investment tax credit in 1time τ period, accordingly; τ is the maximum period of the delay (maximum length of the lag), ε denotes the random value, that characterizes an impact of non-essential, random factors, computational errors and measurements, etc.

If there is a linear dependence between the growth of the entity's profit and the amount of the investment tax credit, then the model (1) could be written as:

$$\Delta P_t = \alpha + a_0 ITC_t + a_1 ITC_{t-1} + ... + a_\tau ITC_{t-\tau} + \varepsilon, \quad (2)$$

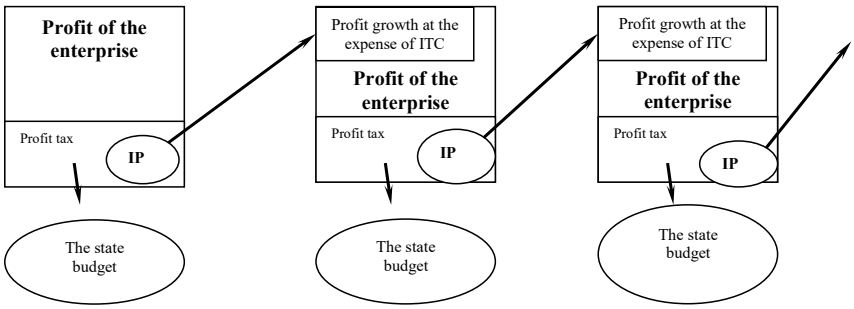
where α is initial (zero) profit level, a_0 denotes regression coefficient that describes

ITC (investment tax credit) influence on the profit increase for the current period of time, *a1* denotes regression coefficient, which describes ITC influence on the profit increase with a delay in one period of time, etc. Dependence (1) describes the case where the impact of investments on the entity's profit generation is not limited to the current period of time, but is felt for several periods which is common for the functioning of economic entities. It is worth noting that we choose a finite profit growth distributed-lag model due to the fact that after the maximum delay period τ the cost of the equipment repair (renovated or bought at the ITC expense) will exceed the amount of profit received from the investment tax credit.

The mechanism for the formation and use of the entity's profit, in this case, is shown in Figure 6.

Figure 6

Dynamics of the entity's profit generation



Source: Built by the authors.

In order to determine the fraction of the "investment tax credit" in the overall profit of a business entity, it is expedient to apply a methodology of economic-mathematical modelling, which will allow identifying effective strategies for managing the profit of the entity.

In this case, each of the participants, both enterprise and the state pursue their own diametrically opposite objectives: the business entity is interested in paying the minimum amount of taxes, which will ensure maximum profit or increase in profits, while the state wants to collect the maximum amount of taxes from business entities.

So, the economic-mathematical model of determining the "investment tax credit fraction of the entity" will have two objective functions: maximum value of the entity's profit and maximum of the accrued taxes sum.

Let t be the index of the time period ($t = \overline{1,T}$), X_{1t} the value of the business entity's profit which is taxed under the general scheme, and X_{2t} the amount of profit taxed under the preferential scheme, respectively.

The value of the investment tax credit can be calculated with the formula:

$$ITC_t = ITR \cdot X_{2t}. \quad (3)$$

Profit before the taxation of an entity *(X)* will then be equal to the sum of the profit taxed under the general and preferential schemes:

$$X_t = X_{1t} + X_{2t},\ t = \overline{1,T}. \quad (4)$$

The criterion of efficiency at the level of the entity involves maximizing the profit that is remaining at its disposal and has the following form:

$$F_1(X_{1t}, X_{2t}) = \sum_{t=1}^{T} \left((1 - ITR)_t \cdot X_{1t} + X_{2t}\right) \to \max, \tag{5}$$

where ITR_t denotes income tax rate during the time period t.

The first summand of the target function (5) characterizes the entity's amount of net profit, and the second summand characterizes the value of the investment tax credit.

At the same time, the state seeks to maximize tax revenues:

$$F_2(ITR, S) = \sum_{t=1}^{T} \left(ITR_t \cdot X_{1t} + p \cdot S(k) \cdot ITR_t \cdot X_{2t}\right) \to \max, \tag{6}$$

where p denotes the probability of exposing an offence (for example, misuse of an investment tax credit for working assets funding); $S(k)$ denotes the amount of fine, which is given as a percentage in relation to the amount of the accrued tax liability for a given number k of committed offences for a certain time period.

According to the Tax Code (Податковий кодекс України) the amount of fine can take a value of 25, 50 and 75 %, so the function $S(k)$ is written as:

$$S(k) = \begin{cases} 1{,}25, & \text{if } k = 1, \text{it means that the offence is commited} \\ & \text{the first time during the last 1095 days;} \\ 1{,}50, & \text{if } k = 2, \text{it means that the offence is commited} \\ & \text{the second time during the last 1095 days;} \\ 1{,}75, & \text{if } k = 3, \text{it means that the offence is commited} \\ & \text{the third time during the last 1095 days.} \end{cases} \tag{7}$$

Unlike in function (5), the amount of fine for the misuse of the investment tax credit and the rate of corporate profit tax act as the managed variables in the target function (6).

The following restrictions could be imposed on the functioning of the corporate tax management system:

1. The total increase in the amount of tax revenue from profit (due to the growth of the tax base), which is taxed under the general scheme, should be no less than the amount of the company's foregone profit (the value of the investment tax credit):

$$\sum_{t=1}^{T} ITR_t \cdot \Delta X_{1t} \geq \sum_{t=1}^{T} ITR_t \cdot X_{2t}, \quad t = \overline{1,T}, \tag{8}$$

where ΔX_{1t} denotes profit growth which is taxed according to the general scheme.

This restriction specifies that the state "gives money" to an entity to finance key assets, so that the state compensates for the shortfall in the amount of corporate profit tax during the future periods of time at the expense of an increase in profit and investment tax credit.

2. Share of the investment tax credit of a business entity in relation to the total amount of investments must be within the limits $\left[I_t^{min}, I_t^{max}\right]$:

$$I_t^{min} \le \frac{X_{2t}}{I_t} \le I_t^{max}, \quad t = \overline{1,T}, \tag{9}$$

where I_t^{min}, I_t^{max} are lower and upper values of the business entity's investment tax credit share in relation to the total investment.

The value of the investment *It* for the time period *t* can be calculated using this formula:

$$I_t = V_t \cdot X_t + K_t + A_t, \quad t = \overline{1,T}, \tag{10}$$

where V_t is a coefficient of using the entity's profit that is allocated for the funding of fixed assets (profit share for investment); K_t is a volume of credit funds directed at the investment; A_t denotes depreciation charges of the entity.

3. The value of an unknown variable should be integral:

$$X_{1t} \ge 0; \; X_{2t} \ge 0; \; t = \overline{1,T}. \tag{11}$$

Thus, the economic-mathematical model of determining the proportion of investment tax credit of a business entity problem can be defined as:

it is necessary to find the following values of X_{1t} and X_{2t} profit, which is taxed under the general and preferential schemes that give the optimal value to the objective functions:

$$F_1\left(X_{1t}, X_{2t}\right) = \sum_{t=1}^{T}\left((1 - ITR)_t \cdot X_{1t} + X_{2t}\right) \to \max, \tag{12}$$

$$F_2\left(ITR_t, S\right) = \sum_{t=1}^{T}\left(ITR_t \cdot X_{1t} + p \cdot S(k) \cdot ITR_t \cdot X_{2t}\right) \to \max, \tag{13}$$

and satisfy the constraint:

$$\sum_{t=1}^{T} ITR_t \cdot \Delta X_{1t} \ge \sum_{t=1}^{T} ITR_t \cdot X_{2t}, \quad t = \overline{1,T}, \tag{14}$$

$$I_t^{min} \le \frac{X_{2t}}{I_t} \le I_t^{max}, \quad t = \overline{1,T}, \tag{15}$$

$$X_{1t} \ge 0; \; X_{2t} \ge 0; \; t = \overline{1,T}. \tag{16}$$

The economic-mathematical model (12) – (16) of determining the investment tax credit share of a business entity problem is a two-criterion problem of nonlinear programming.

In order to solve the problem (12) – (16) we could combine different criteria of objective functions into one (multi-objective optimization problem solving) such as: sequential concessions method, weighted sum of separate functions method, relative value deviations of each target function from its maximum value minimizing method, etc. (Nakonechnyi, Savina, 2003).

The method of sequential concessions consists in ranking the target functions in descending order according to their importance and sequentially solving a problem with one target function while assigning a concession to deviate the values of other (more important) target functions from its optimal value.

The disadvantage of this method is the necessity to determine a concession value, on which the optimal solution depends, and the fact that there is no single way to solve this problem.

In this case, the optimal solution depends on the subjective considerations of the person who solves the problem and/or decides.

The constructed problem model of determining the investment tax credit share of a business entity is solved using the financial and tax returns data of the construction industry entity (Limited Liability Company Galbud).

Data on the amount of taxes paid, depreciation charges, profits, and credit debt, etc. (Galbud Limited Liability Company, 2018) serves as an input for calculating the profits that are taxed under the general and preferential schemes, and the tax investment credit (see Table 5).

Table 5

The key figures of the Galbud Limited Liability Company activity

Index	2008	2009	2010*	2011	2012	2013	2014	2015	2016	2017
Profit of the enterprise, ths. UAH	479.9	110.7	129.8	188.8	123.8	104.8	111.2	167.4	236.5	198.8
Corporate income tax, ths. UAH	119.97	27.68	31.15	43.41	26.00	19.91	20.03	30.13	42.6	32.8
Annual depreciation amount, ths. UAH	53.2	48.9	39.5	44.2	57.1	39.3	41.4	48.5	57.0	51.4
Credits, ths. UAH	84.0	40.0	50.0	60.0	70.0	50.0	60.0	55.0	74.0	70.0
Investments, ths. UAH	473.1	144.3	167.4	217.5	213.7	152.2	153.6	196.4	283.3	253.0
ITC share lower limit value	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ITC share upper limit value	0.3	0.2	0.3	0.25	0.3	0.25	0.2	0.3	0.3	0.26
Profit share for investments	0.7	0.5	0.6	0.6	0.7	0.6	0.5	0.6	0.7	0.6

** since 2010 entity is registered as a "small business" enterprise*
Source: Compiled by the authors on the basis of financial and tax reports of the enterprise Galbud Limited Liability Company (2018).

Such indicators as the amount of fine, the probability of exposing the misuse of the investment tax credit, as well as the investment tax credit share lower and upper limit

values of the business entity in relation to the total investment sum may be considered as a type of managerial influence on the tax system of economic entities.

Having solved the problem of determining entrepreneurship investment tax credit share, we obtained the optimal values of the profit, which is taxed under the general and preferential schemes, as well as calculated investment tax credit share in the total amount of the enterprise's profit (see Table 6).

Table 6

Indicators of the Galbud Limited Liability Company tax burden optimization

Indexes	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
The amount of profit, taxed under the general scheme *(X1t),* thousand UAH.	432.6	96.3	79.6	134.4	59.7	66.7	72.9	107.1	155.9	132.6
The amount of profit, taxed under the preferential scheme *(X2t),* thousand UAH.	47.3	14.4	50.2	54.4	64.1	38.1	38.3	60.3	80.7	66.2
Share of profits taxed under preferential scheme, %	9.86	13.03	38.69	28.80	51.79	36.32	34.42	36.03	34.10	33.31
The value of investment tax credit *(ITCt),* thousand UAH	11.8	3.6	12.1	12.5	13.5	7.2	6.9	10.9	14.5	11.9

Source: Elaborated by the authors.

As a result of applying the considered approach to the tax burden management of the enterprise, the profit share of the entrepreneurship, which is taxed under the preferential scheme, varies within the limits of 10-13% under the general scheme of the average economic entity taxation and 28-52% for a small economic entity.

When the company became a subject of small business, the share of ITC increased. This is due to a decrease in total profit, a decrease in income, the need for investments, etc.

The results of the study confirm the inefficient use of the regulatory potential of corporate income tax in Ukraine.

In our opinion, in order to shade economic processes in business and improve the efficiency of the corporate income tax system, first of all, it is necessary to achieve stability in the tax field, in particular, to significantly reduce the frequency of changes in tax legislation. In addition, the taxation of enterprises should focus on incentives, rather than social benefits, with criteria that are adequate to domestic realities, and ensure transparency of their provision and efficiency of use.

As can be seen from the model, as long as the analyzed company did not belong to the category of "small business entity" (small business entities include entities with an annual turnover of less than 10 million euros), its need for a tax investment loan was significantly less. This indicates that large enterprises are more financially secure. Consequently, they have greater internal potential for large-scale investment and innovation projects. However, most of such enterprises are willing to invest their own funds in these investment projects subject to state support, for example, in the form of, for example, tax benefits.

Thus, the application of economic-mathematical modelling to assessing a tax burden and determining the proportion and value of investment tax credit for economic entities will help to develop optimal management strategies for balancing the amount of profit that is taxed under the general and preferential schemes in order to maximize the amount of profit and encourage investment into the upgrade of the production.

The presented model and analysis of the activity and taxation of Ukrainian enterprises demonstrate the need for the application of income tax incentives, and such benefits, while clearly regulating their intended use, promote the modernization and expansion of business entities. These actions, as a result, could increase tax revenues to the budget. Thus, it is possible to achieve a positive effect at both micro and macro levels.

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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SCIENTIFIC AND APPLIED CHALLENGES IN THE CONCEPT "FIXED ESTABLISHMENT" IN THE MODERN TAX SYSTEMS

This paper presents a research on the concept of the "fixed establishment" (FE) regarding the European and the Bulgarian tax practice. The term determines the place of supply of services in the field of indirect taxation which reflects the fair taxation. The aim of this study is to examine the key features of the FE both from practical and theoretical aspect and to draw a conclusion on the future of the concept. The comparison between the European and the domestic legislation outlines the significance of the FE and provides a more detailed survey on its legal nature.
JEL: K2; K33; K34

1. Introduction

FE plays an important role in the VAT (Value Added Tax) taxation of supply of services. At European level, it is defined in Art. 11 of the Regulation (Council Implementing Regulation (EU) No 282/2011 of 15 March 2011 laying down implementing measures for Directive 2006/112/EC on the common system of value-added tax). The CJEU (Court of Justice of the European Union) has also repeatedly examined its legal nature in numerous decisions. In the Bulgarian tax legislation, the FE's definition is outlined in the VATA (Value Added Tax Act).

In the current study, the author examines the specific features of the FE both from theoretical and practical, from European and national, from economic and legal perspective. At European level, there are separate studies on this issue (Feria, 2016; Pistone, 1999; Spies, 2017). The Bulgarian tax doctrine, however, lacks a comprehensive study of the concept both theoretically and practically. The current tax trends internationally modify the FE for the practical needs and develop the tax doctrine.

The analysis begins with a comparison between the FE and the PE (permanent establishment). Then several CJEU's (Court of Justice of the European Union) cases on this issue will be examined as well as the Bulgarian practice both from NRA's (National Revenue Agency) and SAC's (Supreme Administrative Court) point of view. The current paper ends with a conclusion of the results and some ideas regarding the future of the concept.

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2. Comparative analysis of the terms "fixed establishment" and „permanent establishment"

By the examination of FE's concept, it is necessary to make a comparison with other concepts such as PE that look similar and may lead to practical difficulties. FE and PE are key terms in the international and domestic tax law with different purposes and tax effects.

"Fixed establishment' shall be any establishment, other than the place of establishment of a business referred to in Article 10 of this Regulation, characterised by a sufficient degree of permanence and a suitable structure in terms of human and technical resources" (Art. 11, para 1 and 2 of the Regulation).

Pursuant to Art. 5, para 1 of the OECD-MC (OECD Model Tax Convention on Income and Capital, Condensed Version 2017) "Permanent establishment' means a fixed place of business through which the business of an enterprise is wholly or partly carried on".[2]

The following similarities may be found in the wording of the abovementioned definitions. The first necessary condition for their constitution is their objective existence on a specific geographical location. Second, the term "business" is included in both definitions, proceeding from the economic purposes and the objectives pursued by outlining the two concepts. Third, the existence of a separate independent entity, to whom both terms remain in a fixed relationship/ certain degree of dependency (economic and/or legal), is essential. Fourth, not every place/establishment may fall within the scope of the two definitions – a sufficient degree of permanence or wholly or partly conduction of business is required. This permanence shall be both temporally (for a certain period of time) and spatially (on a certain place). The relevant tax rates in the state where the PE and the FE are located are applicable also for their taxation. Their existence leads to compulsory administrative duties such as registration for tax purposes, submission of tax returns, payment of the tax due and others.

After the examination of the similarities between the two concepts, their differences are outlined as well. The FE and the PE are two significant international definitions, which existence is conditioned by different objectives pursued. The FE is applicable in the field of indirect taxation, whereas the PE is connected with the direct taxation. The FE determines the place of supply of services. The PE, on the other hand, indicates the taxation of the business profits of the enterprise in the source state.

Art. 5, para 1 of the OECD-MC is the basic rule regarding the PE's constitution. It is specifically determined in the Commentary (Commentary on OECD Model Tax Convention on Income and Capital) that the PE may be constituted without human resources, even through e-commerce such as computer equipment (para 122-131). The FE's definition, however, explicitly contains both the existence of human and technical resources as a prerequisite. Perhaps for the purposes of the dynamic commercial relationships, it is appropriate to reconsider the concept in this direction, paying attention also to the introduction of the virtual PE regarding the significant economic presence.

[2] The PE's basic rule under the OECD-MC will be examined in this paper.

Art. 5, para 2 of the OECD-MC lists through a non-exhaustive catalogue the possible forms of PE. They may also be applicable for the FE, but only if they lead to a taxable supply, to a generated turnover.

The building site, the construction or the installation project as possible forms of PE are separated in Art. 5, para 3 of the OECD-MC. The text explicitly introduces the 12-month threshold for PE's constitution. Such a time criterion does not exist in the FE's concept. Moreover, by the real estate's existence, the VAT is usually charged depending on the property's location. There is no time limit for the FE's constitution if the necessary requirements are met.

Art. 5, para 4 of the OECD-MC examines the cases of PE's non-constitution - those with auxiliary or preparatory character. The FE's concept does not contain such text. Of significance is not only the activity's treatment as a core or auxiliary/preparatory one, but if the supply is performed and its nature. For example, the following scenarios are possible. A warehouse without human presence but performing a core activity of the enterprise trough modern equipment may constitute PE, but it may not be a FE because of the lack of human presence. A warehouse may be operated by workers and machines, but it may not generate turnover and thus may not lead again to FE. Conversely, even if a FE is formed, if the activity is auxiliary or preparatory, a PE may not be constituted. As an argument that an auxiliary may be part of the independent economic activity is the case C-268/83 Rompelman (para 22). The above examined issues evidence for the variety of scenarios that may be encountered in practice and may have different impact in the field of direct and indirect taxation.

Art. 5, para 5 and para 6 of the OECD-MC introduce the figure of the dependent and the independent agent. In the first scenario, a PE may be constituted, whereas in the second – no. Both cases, however, are inapplicable for the FE because the merely performance of the agents may not lead its constitution.

Despite the outlined differences between the two concepts, their overlapping is often in practice. However, they are possible cases where the constitution of FE/PE does not automatically lead to the presence of PE/FE. Therefore, the individual examination of every single case is compulsory.

After the comparison between the PE and the FE from an international perspective, attention will also be paid to the Bulgarian legislation. The FE's definition under VATA begins with a non-exhaustive catalogue of possible forms in § 1, p. 10 of the SP (Supplementary provisions) of the VATA.[3] Most of them are also part of the PE's definition in § 1, p. 5, l. "a" of the SP of TSSPC (Tax and Social Security Procedure Code).[4] They are also identical to Art. 5, para 2 of the OECD-MC. Similar examples of PE

[3] "Fixed establishment" shall be a representative office, a branch, an office, a bureau, a studio, a plant, a workshop (factory), a retail shop, a wholesale storage facility, an after-sales service establishment, an assembly project, a construction site, a mine, quarry, prospecting drill, oil or gas well, a water spring or any other place of extraction of natural resources, a fixed place (whether owned, rented, or allocated for use) or a fixed base wherethrough a person carries out economic activity within the territory of a country, whether wholly or partly.

[4] "Permanent establishment" shall be:

and FE would have led to the initial conclusion that the two concepts are with nearly identical nature and purpose. Another similarity may be found out in the methods of usage on their constitution. They may be owned by the taxpayer, may be rented or be used on other grounds. The third common feature is that the two concepts are in direct connection with the performance of wholly or partly business (from PE's perspective), respectively economical (from FE's perspective) activity. However, there is no clear criterion of what is meant by "partial" activity and whether it should meet a certain threshold to be defined as such.

Despite the similarities between the two concepts, most of which because of the usage of identical expressions, there are also a number of differences. First, attention will be paid on the structural layout of the concepts.

While the PE is introduced in the TSSPC and CITA (Corporate Income Tax Act) and PITA (Personal Income Tax Act) refer thereto, the FE is defined in the VATA. Therefore, the legislator clearly and unequivocally outlines their scope – PE in the field of direct taxation and FE – in indirect taxation. The PE's Bulgarian definition, separated in § 1, p. 5, l. "a" SP of the TSSPC, follows basically the texts of Art. 5, para 1, para 2 and para 3 of the OECD-MC. On the other hand, the FE's term does not directly correspond to the text set out in the Regulation. In this regard, the entry into force of the VATA and the Regulation are the reason for the different wording. The new VATA is effective in Bulgaria as of 2007 whereas the Regulation was adopted in 2011.

The following differences regarding the nature of both concepts may be summarised as follows. First, regarding the representative office in the Bulgarian PE's definition, an explicit condition is its registration under the Bulgarian law. This is in contrast with the representative office from the Bulgarian FE's definition where there is no such requirement. However, the Bulgarian VAT registration is also compulsory for the FE despite the lack of explicit text in the provision. Second, the place of management as an example of PE is not covered by the FE's definition. Such a legislative decision is determined by the specifics under VATA and the supplier's place of economic activity which reflects the place of supply of services. Third, the FE contains also a fixed base as a possible example of its constitution, which is not included in the PE's definition. There are no explicit criteria regarding the status of this fixed base. Only the necessity for its geographical location is outlined. On the one hand, it is similar to one of the PE's features. On the other, the opportunity for a broad interpretation of the possible hypotheses therefor is provided. This may also be interpreted as a kind of proof that the catalogue of FE's hypotheses is non-exhaustive. Moreover, in some cases despite their explicit inclusion in the definition they do not lead automatically to the FE's constitution.

(a) a fixed place (whether owned, rented or used on other grounds) wherethrough a non-resident carries on business inside the country, wholly or partly, such as: a place of management; a branch; a representative office registered in the country; an office; a bureau; a studio; a plant; a workshop (factory); a retail shop; a wholesale storage facility; an after-sales service establishment; an installation project; a building site; a mine; a quarry; a prospecting drill; an oil or gas well; a water spring or any other place of extraction of natural resources;

Although at first glance, the two concepts seem similar, several differences regarding their purpose and scope may be found out. Therefore, the FE and the PE may not be defined as synonyms, although the constitution of the one leads to the constitution of the other very often in the practice. The almost identical Bulgarian definitions of both terms may also increase the risk of their uniformity. Therefore, a detailed examination is required.

3. Practice of the Court of Justice of the European Union

The case Berkholz (C-168/84) was the first one examining the FE's concept. The effective place of management of the German company "Abe-Werbung Alfred Berkholz" (Berkholz) was in Hamburg, Germany. Its main activity consisted of the installation of gaming machines and their usage. Some of them were situated on the board of two ships owned by Deustche Bundesbahn. Their usual route were Puttgarden, the German Island of Fehmarn and Rødbyhavn, Denmark. The maintenance of the gaming machines was carried out regularly by employees of Berkholz despite the lack of own premises. Regarding the factual background, questions about the taxation of these services raised, one of which was the existence of FE on the boards of the ships.

After the analysis of the AG's (Advocate General) Opinion Mancini and the CJEU's judgement, they were several key aspects. From the beginning of its arguments, the AG carefully analysed the term 'fixed establishment' and in particular what was meant by the term "fixed". He correctly concluded that immanent feature is the lasting nature of the activity, which may not be temporary or short term (p. 2255 of the AG's opinion). However, no timeframe was outlined for the FE's constitution (such as the specified in the Commentary 6-month threshold regarding Art. 5, para 1 of the OECD-MC). It should be noted that due to the variety of possible scenarios, it is difficult to fix a certain time framework (practically PE may be constituted even if the time threshold is not fulfilled). Moreover, this was the first case in such a complex issue and setting a specific time limit would have a significant impact on subsequent practice and would hardly cover all possible hypotheses. Therefore, this should not be considered as a disadvantage.

Intriguing was the Mancini's view on the FE's legal nature. In order to have a FE, a certain degree of organisation, structure of the place was required (p. 2255). The existence of staff was also necessary, who trough technical means, might perform the activity. Thus, it might be concluded that both criteria (technical and human resources) were essential for the FE's constitution.

The CJEU examined Art. 9, para 1 of the SVD (Sixth Council Directive 77/388/EEC of 17 May 1977 on the harmonisation of the laws of the Member States relating to turnover taxes – Common system of value-added tax: uniform basis of assessment) as an applicable criterion for the current case. FE is one of the possible alternatives (but not the only one) when there is a permanency of human and technical resources on a certain place. As the staff's presence was rather incidental (only by the need of repair/accident), it did not satisfy the permanence of the place and therefore might not constitute FE.

It may be concluded that in this case, the CJEU interpreted strictly the FE's provision and precluded the possibility of a broad interpretation. Such an approach does not seem surprising. On the one hand, this is the first decision on the FE's concept and one rather unusual and revolutionary ruling would lead to many discussions on its legal nature. On the other, the analysed case was reflected from the current reality (the 80s of the last century) when such activities were performed mainly with staff support. At this time, it was difficult to determine the impact of the fully automated activities which today are an important issue regarding taxpayer's fair taxation.

A similar conclusion was reached in another CJEU's judgement – Faaborg-Gelting Linien A/S (Case C-231/94 (Faaborg-Gelting Linien A/S v. Finanzamt Flensburg). Faaborg-Gelting Linien was a Danish company that provided meal and drink to passengers on a ferry in ports in Germany and Denmark. A question regarding the activity's nature – supply of goods or supply of services, was raised and consequently how it would affect the VAT charge. Another issue was the FE's constitution on the ferry's board. Both AG's Opinion (para 5 and 11) and CJEU's judgement (para 14, 15 and 18) confirmed that in this case there was a supply of service referring to the Berkholz case. The requirement for human and technical resources with some degree of permanence for the FE's constitution was crucial. Therefore, the absence of one of the two criteria might not lead to FE.

It may be concluded that in both cases, the same approach was applicable that gave preference to the place of establishment of the supplier. This also reflected to the VAT charge in that state as well. Such an approach is more a precaution against the possible non-charge of VAT due to the different rules in the different tax systems of the states that would create a dispute about the proper tax treatment.

A landmark decision regarding the FE's concept is DFDS (Case C-260/95 (Commissioners of Customs and Excise v. DFDS A/S). The Danish company DFDS A/S owned 100 % of the capital of the British company DFDS Ltd. The latter was a tour operator within the UK. The two companies concluded an agency agreement. According thereto, the parent company was involved in the supervision and control of the provided by the subsidiary tours. The latter, after approval from the parent company, concluded contracts and promoted the brand. The subsidiary was not allowed to work for other companies without the prior approval of the Danish company.

In order to assess whether the Danish company had a FE at its disposal in the UK through its subsidiary, the AG La Pergola referred to the number of CJEU's judgements (para 16, 23, 27, 30). On the one hand, he examined the Berkholz case as the fundamental one on this issue. On the other, he took into account the judgements concerning the legal status of the tour operator and the agent (Cases C-163/91 Van Ginkel; C-266/93 Bundeskartellamt v Volkswagen and VAG Leasing; C-311/85 Vereinigung Vlaamse Reisbureaus).

According to La Pergola the key point by resolving the difference was the dependence of the British company to the Danish. In its conclusion, the AG examined the subordination of the subsidiary on two levels (para 22). The 100 % shareholding was an indisputable sign of the dependence to the parent company. The contractual clauses also provided similar arguments in this regard. According to the AG, from an economic perspective, DFDS Ltd was an auxiliary part of the Danish company in UK (para 24).

Once after the estimation of the dependency, La Pergola considered that were sufficient arguments for the FE's constitution (para 27). The British company had over 100 employees at its disposal for an indefinite period of time also using technical resources.

The CJEU's judgement followed La Pergola's comments confirming the dependence of the British company to the Danish parent company (para 23, 26). The main approaches for FE's constitution were observed as well as an analysis of the contractual relationships that showed the existence of subordination (para 17, 23, 24).

DFDS case is intriguing for several reasons. For the first time a separate legal entity, which was the subsidiary, was defined as a FE. This shows the diverse nature of the concept and that there are no restrictions in the legal form of its constitution if it meets the necessary conditions. The relationship between the two associated enterprises was also detailed explored and how this reflected in the service's performance.

The CJEU's judgement, however, raises some questions. For example, it is not explicitly clear whether the two criteria observed by the AG shall be applied cumulatively and is there any hierarchical level. In this case, the subsidiary's activity was entirely dependent on the parent company. It is uncertain whether the AG's position may change if the subsidiary acts on behalf of several companies, as well as by other significant changes of the contractual terms. Someone may also argue that such an approach may lead to unequal treatment and to a violation of freedom of establishment regarding the multinational companies following the similar model.

Relatively soon after the DFDS's judgement, the CJEU ruled on another case regarding the FE's concept (Case C-190/95 (ARO Lease BV v. Inspecteur van de Belastingdienst Grote Ondernemingen te Amsterdam). The Dutch company Aro Lease BV concluded vehicle leasing contracts. It had clients from the Netherlands and Belgium that concluded these contracts by Belgium intermediaries/dealers. The latter received a commission for the services provided. A Belgian customer chose a vehicle from the Belgian dealer and the latter offered it according to the agreed payment. The intermediary's activity did not directly reflect to the final performance.

If at the end of the leasing period the vehicle was not sold immediately to the customers, it remained a certain time in Belgium in the dealers' premises. Aro Lease BV had no office at its disposal in Belgium and used the dealer's premises at its own risk and expense. The latter did not have any additional right to influence the customer's choice for the contract's conclusion. The vehicles were registered in Belgium and the customers paid any tolls and other related to the maintenance costs due.

Regarding the current factual background, the inquiry was whether the leasing of vehicles might constitute a FE for Aro Lease BV in Belgium.

The AG Fennelly's arguments were based on the leasing's nature. For this purpose, he analysed the similar aspects comparing the cases Hamann (Case C–51/88 Hamann v. Finanzamt Hamburg- Eimsbüttel) and Berkholz (para 21 and 29). After the exploration of the FE's key features, he was on the opinion that both criteria missed in the current situation (para 30). Indeed, the existence of agents who assisted with the vehicles' supply was a sign of human presence. However, they were not employees of the Dutch company

but were only engaged in separate and independent transactions. According to Fennelly and after the careful analysis of Berkholz, their functions did not fall within the scope of the requirement of "human resources". An argument was the different location of agents in Belgium which might not constitute one single FE (para 31). In addition, they also performed preliminary preparatory and subsequent services.

On the other hand, the conclusion of the contracts was in the Netherlands. For this purpose, the company used human and technical resources (para 31). According to Fennelly Aro Lease BV did not have a FE at its disposal in Belgium and therefore the place of supply of services was in the Netherlands because of the company's establishment.

The CJEU was on the same view regarding the FE's non-constitution. Their Belgium registration was irrelevant (para 21). The option that the vehicle remained on the dealer's premise was with a subsequent nature after the agreed licensed period.

The same approach was followed in another case with identical factual background, on which Fennelly was again the AG (Case C-390/96 Lease Plan Luxembourg SA v. Belgian State). The Luxembourg company Lease Plan provided vehicle leasing services to Luxembourg clients. The latter might provide them to their employees in Belgium using the services of Belgian garage operators. Both the AG's Opinion (para 16) and the CJEU's judgement (para 21) referred to Aro Lease case (C-190/95) because of its identical factual background. This was the reason for the lack of detailed arguments. The CJEU strictly observed the approach followed in the previous case as the applicable one (para 24 and 25). The understanding of the FE's non-constitution regarding the leasing contracts was confirmed once again.

In another case the CJEU confirmed the FE's existence (Case C-452/03 ((1) RAL (Channel Islands) Ltd, 2) RAL Ltd, 3) RAL Services Ltd, 4) RAL Machines Ltd v. Commissioners of Customs and Excise). RAL Ltd, RAL Services Ltd and RAL Machines Ltd were companies established and incorporated under the UK legislation, whereas RAL Channel Islands (CI) – in Guernsey. The four companies were subsidiaries of the British RAL Holdings Limited. The first of them owned gaming machines in the UK using its own staff at owned premises. After a subsequent restructuring on group level, RAL granted their license to CI, giving the opportunity to use the gaming machines on the UK's premises. The CI's main activity was the provision of their public use to the clients by subcontracting the RAL Services Ltd. All of the CI's employees were situated in Guernsey and were engaged mainly with accounting and monitoring tasks. The CI pretended not to pay the VAT in the UK as the services provided were outside the EU in the Guernsey's office. One of the issues raised was the clarification of the FE's concept.

In his Opinion the AG Maduro analysed detailed this issue taking into account the four landmark decisions Berkholz, Faaborg-Gelting Linien, ARO Lease and DFDS (para 21, 23, 28, 29, 30, 42). Besides the FE's question, he drew attention to another global risk – the companies' attempts to move their business outside the EU trough such restructurings, while at the same time providing service to consumers within the EU territory (para 64).

With respect to FE Maduro examined several key points. He analysed the legal nature of the term paying attention to Berkholz and Faaborg-Gelting Linien, also paying attention

that the services provided in those decisions are on the ferry's board. In conclusion, he argued that the lack of staff in relation to the activity provided led to FE's non-constitution in the examined judgements (para 40). Since it came to use of slot machines, the judgements ARO Lease and DFDS were also applicable. The different nature of the activities, however, required a different approach for the facts' examination. Therefore, Maduro focused on the availability of technical and human resources in the current case (para 45).

The slot machines were characterised by a degree of permanence at the premises. A fixed working hour was outlined for this purpose when the clients might use them. In this respect, the requirement for technical resources was fulfilled. In terms of human resources, the existence of staff that maintained the slot machines and served the clients was evidence of their presence. Therefore, this aspect, that was missing in Berkholz, was available here. However, by observation of the two other judgements, there was no FE despite the existence of human resources. Based on the nature of the activities and the restructuring itself, according to Maduro it was not necessary that CI had its own employees at the premises (para 49).

In this case, a distinction between the resources might be made: those that were under the direct dependence of the supplier and therefore might be determined as his own, and those that stayed in causal connection with the latter, but they were under "indirect" dependence. The symbiosis of both satisfied the requirement for human and technical resources. According to Maduro only the resources that were of direct significance for the supply and affected the client's choice to use the slot machines, should be under direct control (para 52). Moreover, by careful examination of the hired employees' work, it might be concluded that their activities were rather supporting and auxiliary. Indeed, they contributed to the service's provision, but their nature was not determined by their work. Proof of this was that the employees had no direct role in the conclusion of CI's contracts with the clients and might not influence the decision of the latter whether to use the slot machines or not (para 55). Maduro also considered that the requirement for technical and human resources was met and logically CI constituted FE. Despite all these arguments, the CJEU applied the special rule under Art. 9, para 2, l. "c" of the SVD regarding the recreational activities, thereby excluding the application of Art. 9, para 1 and the FE.

In Planzer case (C-73/06 (Planzer Luxembourg Sàrl v. Bundeszentralamt für Steuern) the seat of Planzer Luxembourg Sàrl was situated in Luxembourg. His only partner was located in a third country – Switzerland. In this connection, the question arises whether the company had a FE in Switzerland because of the partner's location. The CJEU referred to cases Berkholz, DFDS, Aro Lease and Lease Plan to provide solid arguments (para 43, 54, 55). The view was shared that the auxiliary and preparatory activities might not satisfy the FE's criteria (para 56). Of importance for the company's business was the place where the decisions were taken, where the meetings of the board of the directors were held. This means that the place of establishment of the sole proprietor or the banking transactions that did not have any significant importance for the company were irrelevant for the FE's constitution (para 56). Therefore, it was important where the main decisions on the company's management were taken and where they performed their central administrative functions (para 63).

Another case that indirectly examined the FE is Le Crédit Lyonnais (C-388/11 Le Crédit Lyonnais v. Ministre du Budget, des Comptes publics et de la Réforme de l'État). Le Crédit Lyonnais (LCL) was a French bank that had branches both in the Member States and third countries. After a tax audit LCL raised a number of questions regarding the realised from its branches revenues and how this reflected to the VAT refund under the SVD. An inquiry regarding the treatment of the branches from third countries was also posed.

In his Opinion, the AG Villalón analysed in details the current factual background without explicitly to share some thoughts on the FE's concept. Based, however, on its legal form, the branch was part of a legal entity which was dependent from the parent company and might be its FE. Therefore, the taxation should be performed at the branch's location, which determined the reason for the VAT refund in this Member State. Moreover, the SVD outlined the realised of the branch turnover to be attributed to the parent company's establishment in the other state (para 74). Following such an approach the same regime should be applicable also for the branches located in third countries (para 82).

The CJEU shared the same view paying attention to the FE's concept and its relevant treatment (para 33 and 34). The VAT should be charged depending on its geographical location. The equal treatment for the branches in third countries was confirmed by the Court as well (para 44). Although the FE's legal nature was not detailed outlined and its key features were not examined, the case Le Crédit Lyonnais is vital for several reasons. First, the typical FE's example – the branch, was observed. Second, an opinion was expressed regarding the branches in third countries to be treated equally as the EU branches, although they do not fall within the scope of the SVD.

In 2011 the CJEU ruled another judgement related to the FE to two joined cases (C-318/11 and C-319/11 Daimler AG, Widex A/S v. Skatteverket). In the first case, Daimler had a PE in Germany and a subsidiary in Sweden. The company carried out winter testing of cars in Sweden without having permanent staff at its disposal. The employees and the equipment arrived in Sweden only by main activity's performance. Daimler did not perform any VAT taxable activities in Sweden. Their aim was to guarantee the sale of cars in Germany.

In the second case, C-319/11 Widex had a PE in Denmark engaged in research activities. There were nor sales, neither marketing activities performed. The employees' wages were paid by the head office in Denmark. Widex also had a Swedish subsidiary, which sold the goods to the PE as a distributor. The goods and services acquired by the PE were focused solely to the research activities.

The CJEU analysed the expression "fixed establishment from which business transactions are effected", as well as the possibility that PE is FE at the same time. According to the Court, it was crucial to determine whether the supplies were taxable or not. Therefore, "'transactions' used in the phrase 'from which business transactions are effected' can affect only output transactions" (para 36). In this case, the absence or presence of FE was not a valid criterion for a subsequent VAT refund (para 43). In summary, the CJEU concluded that due to the nature of the activities of the two cases, they did not result to taxable supplies and thus they did not fall within the definition of "fixed establishment from which business transactions are effected" (para 44).

It may be concluded from the CJEU's position that the PE's existence did not automatically lead also to the FE's constitution. The key factor was the nature of the activities, which respectively reflected to the VAT refund.

One of the most interesting cases in this matter is Welmory (C-605/12 (Welmory sp. z o.o. v. Dyrektor Izby Skarbowej w Gdańsku). Welmory LTD was a Cypriot company which organised "sales by auction on an online sales platform". It concluded agreements with a Polish company. The latter sold the offered goods using Polish domain which is maintained by the Cypriot company in Polish. The used for the activity equipment was owned by Welmory and the hired staff had not labour relationship with the Cypriot company. The inquiry was about the proper tax treatment of the service provided and whether there was a FE for Welmory LTD in Poland.

This case is significant for several reasons. Attention was paid to the FE in the e-commerce – something very actual and challenging from a tax perspective. This was also the first case regarding the place of supply after the reform of those provisions in Directive 2008/8. Last but not least, in this case, the service was performed not "by/through" the FE, but "to" it. Because of the year of the CJEU's judgement – 2014, Art. 11 of the Regulation was in force.

In her Opinion AG Kokott pointed out that the present case was about the recipient of the service under Art. 44, second sentence of the VAT Directive, whereas in the CJEU's doctrine Art. 9, para 1 of the SVD was examined regarding the provider (para 37). It was also stated, that Art. 11, para 1 of the Regulation specified the receipt of the services for own needs as an intrinsic feature within the scope of the provision (para 42). After the overview of the concept's development, it was once again outlined what the requirements for FE's constitution (para 45) were.

An important issue of her opinion was that "it is not necessary for the taxable person to have at his disposal there human resources, which are employed by him, or to have technical resources which he owns" (para 48). This also applied to the technical resources provided by Welmory (para 50 and 56). Thus, the scope of the concept was broadened. Its aim was to limit possible abuse when companies deliberately use foreign resources. The author considered that such an approach is objective and practical conditioned. He also agrees with Kokott's subsequent position that the use of the resources for the needs of the Cypriot company should be controlled by it. In other words, their use for short periods or the lack of disposition thereto would not constitute FE.

Another intriguing AG's point was that „Moreover, from a factual point of view it is doubtful whether as a rule, every structure which, in terms of its human and technical resources, is able to use services for its own needs would not indeed at least have the possibility of supplying services itself" (para 43).

The FE's existence for the Cypriot company was confirmed by the CJEU. The Court shared the view that the practice for Art. 9, para 1 of the SVD was also applicable for Art. 44 of the VAT Directive. Once again, the secondary nature as an alternative by risk for unequal tax treatment for the services was taken into account (para 53). Its main features were outlined regarding the current factual background (para 60).

Why does the author consider that this case is one of the most vital and up to date on the FE's concept? As already stated above, this case was about the FE's constitution of the recipient of the service in connection with the new rules on the place of supply pursuant to Art. 44 of the VAT directive as of 2010. It should be noted that based on the principle mutatis mutandis followed by the CJEU, the interpretation of Art. 9, para 1 of the SVD should also be applied for Art. 44 of the VAT directive. Last but not least, given the current trends in relation to the e-commerce it may fulfil the requirements for FE in certain cases. The explicit reference of the necessary technical resources in the CJEU's judgement confirmed the understanding for the possible lack of human resources but the possible FE's existence. The online trade provides new business opportunities, which should introduce revolutionary and innovative taxation rules. Although the CJEU did not explicitly address this issue, Kokott drew attention to the control of the used resources. However, the control's degree was not explicitly outlined. For example, it may be argued whether there is a sufficient control, if the resources are available at certain times on certain days. The author shares the view that if the period is extended (not short term), it fulfils the requirement for control. This will depend on the individual examination of every single case because of the specificity and diversity of activities.

The CJEU's case law examined the key features of the concept that are relevant for its constitution. It is a welcoming idea not only to follow the relevant doctrine (referring to the specific judgements), but to analyse how it would reflect to every single case (based on the factual background). Recent cases developed the concept and modified it according to the practical needs.

4. Some institutional solutions in the Bulgarian practice

The introduction of the FE's concept in the Bulgarian VATA is logically determined by its purpose. The term appears in many provisions in the VATA. For example, FE is included of the new Art. 15a – the regime of warehousing of goods to request, in force as of 01.01.2020. It is also an integral part of Art. 21 regarding the place of supply of services. FE is a key factor by determination of the turnover for a partial tax credit under Art. 73, para 3, p. 3 and para 4, p. 2. Another relevant provision of therewith is Art. 96, para 7, p. 2 regarding the taxable turnover for compulsory VAT registration. The definition itself is outlined in § 1, p. 10 of the SP. They are another relevant provisions on the FE's concept as well. It may be concluded that its implication in a number of texts confirms its significant role in the field of indirect taxation.

FE also appears in the RAVATA (Regulations of Application of the Value Added Tax Act) in Art. 119, para 5, as wells as in the application forms for registration for application of special regime outside the EU for VAT charge on supply of telecommunication services, radio and television broadcasting services or services provided electronically with recipients non-taxable persons and VAT return for the application of special regime in the EU pursuant to Art 159b, para 4 VATA.

FE is part of the text of Art. 2, para 1, p. 1 of the Ordinance No H-10 (Ordinance № H-10 on the refund of paid valued added tax to foreigner entities that are not established on the

community territory) outlining which individuals are foreign and may reimburse the VAT under this Ordinance. Similarly, Art. 2, p. 1 of the Ordinance No H-9 (Ordinance No H-9 of 16 December 2009, On the refund of value added tax to taxable persons, not established in the member state of refund, but established in another member state of the Community) contains the same requirement.

To sum up, FE plays an important role regarding the supply of services in the Bulgarian domestic legislation. Unlike the PE, which is conceptually outlined in the TSSPC and CITA and PITA refer thereto, the FE is defined only in the VATA.

4.1. Practice of the Bulgarian National Revenue Agency

The FE's concept was analysed in several guidance issued by the NRA. One of the most common cases in practice is regarding the proper treatment of the representative office and the possibility to constitute FE. In this particular case, a foreign company that did not perform independent economic activity in Bulgaria concluded labour contract with its representative office whose activity was limited to advertisement and analyses (Guidance No 53-00-266 from 2013). By examination of the factual background, the NRA distinguished the figure of the representative office under Art. 24, para 2 of the EIA (Encouragement of Investment Act) and the representative office under VATA. In the first case, the office was not allowed to perform an economic activity. NRA followed the approach of the established international case law (cases C-168/84; C-190/95; C-231/94 and C-260/95) outlining the main FE's features. Correctly, the tax authorities were on the opinion that if the representative office is not a FE, it does not perform an independent economic activity. Opposingly, despite the prohibition under Art. 24, para 2 of the EIA FE would be constituted, if the office exercised such activity.

Another NRA's guidance regarding the representative office of a foreign entity from a third country, focused on several possible hypotheses (Guidance No M-24-36-83 from 31.01.2017). The representation office was registered voluntarily pursuant to Art. 100, para 1 of the VATA. From this moment on it exercised its right for VAT credit for the supplies of goods and services received. A consultancy contract, that was concluded several months after the VAT registration, was the ground for its performed independent economic activity.

Referring to the CJEU's judgement Lennartz C-97/90, the tax authorities considered that the future intention for the performance of taxable supplies and the costs incurred therewith determined the representative office as a taxable person with the possibility for VAT credit, if this right was not "exercised improperly or fraudulently".

The following hypotheses on the possibility of FE's constitution were drawn out. If the representative office fulfils the FE's requirements, it falls within the scope of that definition. It is intriguing that NRA applied a broader interpretation regarding the independent economic activity. For example, the mere intention for its performance might be construed as a FE. At the same time, there was no explicit definition of what is "intention". The author is on the view that it should objectively and unambiguously show the possibility of subsequent taxable supply. Conversely, the unrealised subjective intention did not satisfy the FE's requirements. As already stated above, beyond the scope remained

the illegal and fraudulent activities. The NRA also followed the international doctrine that the Bulgarian VAT number does not automatically lead to FE.

The possibility of FE's constitution suggests another two hypotheses on the place of supply of services. If the representative office falls within the FE's definition, but the provided goods and services are not directly related to its independent economic activity, but to the foreign entity, the recipient is the latter. Therefore, the place of supply of services would be in the other state applying Art. 21, para 2, the first sentence of the VATA. If it is determined that the recipient is the FE, the place of supply of services would be in Bulgaria.

If the representative office does not meet the FE's definition, for example, it does not carry out an independent economic activity or it is not characterised by a sufficient degree of permanence, the recipient will be the foreign entity and thus the place of supply of services will be in the other state.

The author admires this NRA's approach because of its detailed examination of all possible scenarios.

Another NRA's guidance analysed both the availability of PE and FE (No 26-Г-48/09 from 02.03.2010). A Spanish company performed reconstruction, repairing and installation activities for shops in different Bulgarian cities with a duration from 8 to 12 weeks. Some of them were carried out by two Spanish companies acting as subcontractors. The NRA qualified the activities as construction and therefore explored the special PE's provision. Since the minimum 12-months threshold was not met, neither there was a geographical coherence between the shops, the tax authorities correctly concluded the PE's non-constitution. Regarding the FE, similarly to the above-examined guidance, they paid attention to the CJEU's relevant practice (cases C-168/84, C-190/95, C-210/04). Because of the lack of human and technical resources, there was also no FE. It may be concluded from this guidance that the non-constitution of PE may not lead automatically to the absence of FE as well. For this purpose, NRA did a separate, additional analysis, proceeding from the specifics of the two concepts.

The NRA also expressed a position on the accredited representative providing supply from services in Bulgaria (No 26-Т-115 from 13.12.2010). Pursuant to Art. 131, para 1 of the VATA he represented the FE of the foreign entity. The tax authorities distinguished different hypotheses about the place of supply depending on the status of the recipient of the service. When the recipient is a taxable person in Bulgaria, the place of supply of service is in Bulgaria. The CJEU's practice was also examined (cases C 168/84; C 190/95; C 231/94; C 260/95). If the recipient is a taxable person from another Member State and has no FE in Bulgaria, the place of supply is the location of the recipient's establishment. If the recipient is a taxable person from third country, the place of supply is again the location of the recipient's establishment. If the recipient is an individual performing independent economic activity and has no FE, the place of supply is his permanent address or usually resides.

The VAT treatment of the branch was examined in another NRA's guidance (No 26-Е-32 from 01.06.2012). In this case, a branch of the Portuguese company was registered in the CRRNLPA (Commercial Register and Register of Non-Profit Legal Persons Act). Because

of this, the foreign company had a Bulgarian VAT number. Its core activity was (re)construction of substations, which were part of the Bulgarian electricity system, for about 12-month period. The technical resources were used both from own employees and subcontractors. Regarding the human resources, employees were seconded from Portugal and other subsidiary divisions of the foreign company to Bulgaria. One of the question raised was about the FE's concept.

Several issues for the branch's proper tax treatment are intriguing. It is noteworthy that "the availability of commercial registration of the branch itself does not make the same a FE". Also, the branch's registration excluded the possibility that the Portuguese company might be VAT registered again in Bulgaria regarding its economic activity, no matter of its registration form – compulsory or voluntary. The branch's registration created an opportunity, not an obligation for FE's constitution. For example, if the branch performs taxable supplies, Art. 82, para 1 of the VATA is applicable, as "the tax is chargeable by the Portuguese company, identified by a Bulgarian ID number for VAT purposes – the branch one". Conversely, if it does not participate in the provided supplies and the Portuguese company does not carry them out through another FE, the tax will be charged to the recipient pursuant to Art. 82, para 2, p. 2 of the VATA.

Based on the above NRA's guidance, the following conclusions may be drawn. Although the wording of the FE's definition in the Bulgarian VATA differs from the Regulation and is almost identical with the Bulgarian PE's definition according to the TSSPC, the key factors of the FE's constitution follow Art. 11 of the Regulation and the CJEU's doctrine. The NRA strictly applies the international doctrine in its guidance by determination of the concept. Thus, there is no significantly different Bulgarian approach from tax authorities' perspective on that issue. The cases themselves do not also differ with a very specific factual background. It is possible that the future CJEU's cases would also reflect to the Bulgarian NRA's practice.

4.2. Practice of the Bulgarian Supreme Administrative Court

SAC also examined the FE's concept regarding Bulgarian subsidiaries of foreign companies (Judgement No 3410 from 11.03.2014, SAC by adm. c. No 13104/2013). A Slovenian company was the sole owner of a Bulgarian subsidiary. The latter had hypermarkets in Bulgaria at its disposal. The subsidiary received consultancy services from another Bulgarian company. In this connection, the Slovenian company claimed VAT refund under Ordinance No H-9. Its understanding was that the place of supply of services was not in Bulgaria. The tax authorities considered that such an approach was incorrect because of the subsidiary's existence in Bulgaria, which was a FE under VATA's definition and Art. 11 of the Regulation in conjunction with Art. 44 of the VAT Directive. Thus, the Ordinance was inapplicable. To support such understanding, NRA found arguments in the CJEU's cases C-260/95, C-244/08 and joined cases C-318/11 and C-319/11. For the latter two cases the expression "fixed establishment from which business transactions are effected" was analysed considering that the subsidiary fulfilled this criterion.

Another SAC's judgement examined again the VAT refund procedure – whether it should be under the Ordinance No H-9 because of the foreign status of the entity or its branch was a FE and the relevant VATA provisions were applicable. (Judgement No 3571 from 29.03.2016, SAC by adm. c. No 3794/2015). A Hungarian company had a Bulgarian branch and the Bulgarian VAT number was the same for both because of their identical personality. The branch performed supplies related to the office maintenance, hotel accommodation of the staff and others. NRA took into account the CJEU's joint cases C-318/11 and C-319/11 and considered that the branch did not perform an independent economic activity and thus it was not a FE. Therefore, the VAT refund should be reimbursed under the Ordinance No H-9.

The opposite view shared SAC and confirmed the findings of the Bulgarian Administrative Court of the first instance. Pursuant to § 1, p. 10 of the SP of the VATA the branch was within the scope of the FE's definition. The Bulgarian Administrative Court of first instance correctly applied the CJEU's judgement on case C-244/08 regarding the cost allocation. The branch performed taxable supplies in Bulgaria as a recipient, which might be construed as a proof of its independent economic activity. Moreover, the costs were borne by the branch itself and not by the Hungarian company. That is why, the branch had the right for VAT refund under VATA. Inapplicable for the current case were the quoted by the NRA joined cases C-318/11 and C-319/11 because of the different factual background.

In another case, SAC examined the performed by the PE activity that was at the same time a FE of a German company (Judgement No 2885 from 27.02.2014, SAC by adm. c. No 394/2013). SAC confirmed the NRA's understanding that the FE issued invoices with its Bulgarian VAT number proving its participation in the supplies of goods and services in Bulgaria. If the branch was against this argument, it should present evidence for the opposite hypothesis. This approach followed the wording of Art. 53, § 2, para 2 of the Regulation.

The lack of independent economic activity, respectively of performed taxable supplies, did not lead to FE's constitution in another SAC's case (Judgement No 5770 from 03.05.2018, SAC by adm. c. No 61/2018). A UK company performed clinical trials trough its Bulgarian branch. The branch claimed for VAT refund because it performed supplies only to its parent company for the relevant period. Proof of this were the issued invoices. Despite the existence of premises (office) and human resources (employees), there was no economic activity for the branch for third parties. Finally, it was found out that the transactions performed were internal turnover that did not satisfy the FE's requirements (cases C-7/13, C-318/11 and C-319/11).

The legal dispute in another decision was whether the representative office's registration was a sufficient criterion to constitute a FE (Judgement No 2210 from 17.02.2014, SAC by adm. c. No 13227/2013). SAC followed again the CJEU's practice (cases C-168/84, C-190/95, C-231/94) and the understanding that the registration itself did not automatically lead to FE. Despite the existence of a certain duration of the activity, the absence of taxable supplies was the key factor for its non-constitution.

Both the practice of SAC and NRA followed the applicable CJEU's case law. There is no significant difference between the international doctrine and the Bulgarian perspective. The

welcoming idea is that the domestic legislation examines both the constitution of PE and FE separately and how this reflects to the fair taxation.

Conclusion

The last chapter of this paper is the conclusion summarising the findings and sharing some ideas of the concept's future. At the international level, the CJEU follows its case law doctrine on this issue. The FE's requirements are examined detailed in every single case. More recent judgements follow the newest tendencies combining the traditional perception of the concept and the actual business needs. Nowadays, an open question in practice is the so-called "virtual FE", which in author's opinion will lead to further comments in near future. Another inquiry therewith is whether it is possible to outline its key features, or it depends on every single case. The author is on the view that a combined, comprehensive approach would lead to rational results. On the one hand, it is necessary to introduce some basic criteria (similarly to the virtual PE). On the other, the case studies will further refine the concept and will outline the future trends.

From Bulgarian perspective, both NRA and SAC follow the international doctrine applying the relevant CJEU's judgements for their argumentation. The welcoming idea is that the Bulgarian tax practice distinguishes between the PE and the FE by examination of each separate case. In most of them, the constitution of the PE/FE also lead to existence to FE/PE.

The author believes that the FE was, is and will be a significant tax issue both from a theoretical and practical perspective. The arguments, therefore, are the variety of cases, its practical importance regarding the place of the supply of services and the future dynamic trade. Moreover, the comparison between the FE and the PE will always be discussable regarding the fair tax treatment. That's why further researches examining the FE's dynamic legal nature may develop the concept.

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List of abbreviations

AG	Advocate General
CJEU, the Court	Court of Justice of the European Union
CITA	Corporate Income Tax Act
Commentary	Commentary of the OECD Model Tax Convention on Income and Capital
CRRNLPA	Commercial Register and Register of Non-Profit Legal Persons Act
EIA	Encouragement of Investment Act
EU	European Union
FE	Fixed Establishment
NRA	National Revenue Agency
OECD-MC	OECD Model Tax Convention on Income and Capital, Condensed Version 2017
Ordinance No H-9	Ordinance No H-9 of 16 December 2009 on the refund of value-added tax to taxable persons, not established in the member state of refund, but established in another member state of the Community
Ordinance No H-10	Ordinance No H-10 on the refund of paid valued added tax to foreigner entities that are not established on the community territory
PE	Permanent Establishment
PITA	Personal Income Tax Act
RAVATA	Regulations for Application of the Value Added Tax Act
Regulation	Council Implementing Regulation (EU) No 282/2011 of 15 March 2011 laying down implementing measures for Directive 2006/112/EC on the common system of value-added tax
SAC	Supreme Administrative Court of Republic of Bulgaria
SP	Supplementary Provisions
SVD	Sixth Council Directive 77/388/EEC of 17 May 1977 on the harmonisation of the laws of the Member States relating to turnover taxes – Common system of a value-added tax: uniform basis of assessment
TSSPC	Tax and Social Security Procedure Code
VAT	Value Added Tax
VATA	Value Added Tax Act
VD	VAT Directive, Council Directive 2006/112/EC of 28 November 2006 on the common system of value-added tax

ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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A MULTIDIMENSIONAL CLASSIFICATION FOR THE INFORMATION TECHNOLOGY MARKET[2]

This paper expands the existing informational and analytical opportunities of application of the results of business tendency surveys which solve the problem of the loss of valuable statistical information in its traditional aggregation into simple and composite indicators. Based on methods of multidimensional classification, we develop and discuss an algorithm of statistical analysis that significantly raises the analytical opportunities for the more wide measurement of trajectories of development and short-term fluctuations of the information technology (IT) industry. This allows the construction of behavioural models of business tendency data which improve the understanding of the business cycle in more detail. Furthermore, the empirical results confirm the possibility of receiving various information which increases the analytical potential of business tendency surveys.
JEL: C1; C81; C38; C83; E32; E39; L26; L1; O10; O11; O19; M2

1. Introduction

Diffusion of digital technologies into social and economic systems determines the scientific and practical significance of research on measuring the dynamics of the development of the information technology (IT) industry. As the driving force for transformations in the economy and other spheres, IT promotes successful innovation and accelerates technological changes in the information and communication technology (ICT) sector.

According to the general definition from the Organisation for Economic Co-operation and Development (OECD), ICT sector includes manufacturing and services industries (OECD, 2011). The former "must be intended to fulfil the function of information processing and communication including transmission and display, or must use electronic processing to detect, measure and/or record physical phenomena or to control a physical process," while

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the latter "must be intended to enable the function of information processing and communication by electronic means" (OECD, 2011, p. 58). Definitions used by Eurostat, UNCTAD, the UN Statistical Commission, and the World Bank follow the OECD definition or are quite close to it, varying only on the level of subdivision specification (World Bank, 2009).

IT industry belongs to the services division of the ICT sector. In this study, we follow the definition of IT industry proposed by the Ministry of Digital Development, Communications and Mass Media of the Russian Federation[3]. According to it, the IT industry is a set of organizations whose results are services that are mainly designed to fulfil (or facilitate the fulfilment of) the functions of collecting, converting, storing, presenting data and information electronically.

Global production of ICT goods and services accounts for about 6.5% of the global gross domestic product (GDP), and about 100 million people are employed in the ICT services (UNCTAD, 2017). However, unlike Russia, the ICT sector plays a much more important role in most developed countries – its share in the gross value added (GVA) of the business sector in OECD countries is 1.6 times higher than in Russia (3.4 and 5.4%, respectively), (Abdrakhmanova, Kovaleva, 2018). The absolute size of the IT industry in Russia remains relatively small: the share of IT expenditures in GDP in Russia is only 1.1%, while in developed countries it is 3-4% (Federal 'naja sluzhba gosudarstvennoj statistiki, 2017).

The global economic crisis and the subsequent fluctuations in business tendencies lowered the added value of ICT in general in most OECD countries and Russia, while in the IT industry, especially in the software development industry, it had been increasing. In 2017 the Russian ICT sector GVA gain (2.8% in real terms) was almost twice that of the GDP gain (1.6%). The main contribution to this was made by the IT industry, which grew by 12% (Abdrakhmanova & Kovaleva, 2018).

According to the OECD Digital Economy Outlook 2017, in 2015, investment in ICT in OECD countries was 11% of the total investment in fixed capital and 2.3% of the GDP. Almost 60% of the investment was made in computer software and databases, which are the dominant areas of the IT market, including Russia. In particular, the Russian investment in ICT was 3.1% of the GDP in 2016 (Indikatory cifrovoj jekonomiki: 2018, 2018) and in 2015 it accounted for 3.2% of the investment in fixed capital (Indikatory cifrovoj jekonomiki, 2017).

The important role of the IT industry in the development of the economy as a whole is connected with two channels of influence: firstly, with the development of the latest advanced technologies and, secondly, with the spread of the scale of existing innovations in other sectors of the economy, which can potentially have significant multiplier effects on value chains (Lola, Bakeev, Manukov, 2019). Consequently, along with the spread of IT and the increasing use of computing and communication devices, the dependence of other sectors of the economy on the IT industry is increasing. A particularly profound influence can be observed in high-tech and consumer-oriented segments such as electronics,

[3] Order of the Ministry dated December 30, 2014 No. 502. URL: http://www.consultant.ru/document/cons_doc_LAW_137802/.

communications, entertainment and retail (BCG, 2018). The McKinsey Global Institute (MGI) estimates that by 2030, digital technology can contribute 13 trillion US dollars to global GDP (McKinsey, Company, 2019).

At present, the research of the IT industry is focused on obtaining both quantitative and qualitative aggregated estimates. Available analytical frameworks are mainly represented by various information resources, which contain mainly cumulative estimates of the ICT sector and cover the IT industry only partially.

Ratings and indices are widespread sources of information, including RAEX (Jekspert RA, 2018), "UN E-Government Development Survey" (UN E-Government Development Survey, 2018), ICT Development Index (IDI) (ICT Development Index, 2017), "The Web Index" (The Web Index, 2018), e-Friction Index (Low J-R, 2015) etc. However, due to the aggregated approach of their construction and visualization, they do not allow to quickly measure short-term fluctuations of the IT industry. This is also true for analytical reports by various research organizations, such as (Gartner, 2018; Ernst & Young, 2018; J'Son & Partners, 2018) etc.

With the use of aggregated values, such data can be used in more detail to describe the development of ICT or to assess the achievement of the established purposes and tasks. For example, ICT Development Index (IDI) by the International Telecommunication Union (ITU) represents a unique control indicator of the development of ICT worldwide. This instrument tracks the so-called "digital inequality" between technologically advanced countries and other world. IDI includes 11 indicators of ICT access, usage and skills. Key aspects of ICT are covered by a single measure that allows comparisons between the countries and over time (ICT Development Index, 2017).

There are some advantages in identifying global tendencies using these sources, since, for example, the ratings show the conditions for the transformation of industries, allow to identify barriers and determine priorities for government policy. They make us think about how individual sectors, in particular, in the Russian economy, are not left out of the "digital revolution" and, on the other hand, create an ecosystem of strong ICT players, who can provide ideas and strategies for the new era of big data.

There are frequent changes in calculations for assessing the ICT sector, which often include changes caused by stereotypes, the geopolitical situation and the dynamics of key national macroeconomic trends. Thus, along with their advantages, some problems of the most widespread information content are the variety and instability of methodological approaches, the representativeness of samples, the instability of the distribution of published information, a narrow range of composite indicators for the business climate estimated on the basis of business tendency observations. It is difficult, therefore, to isolate and detail the development of the IT industry at various stages of the business cycle. In the OECD, questions about the measurement of these services in the system of National Accounts (SNA) and the sufficiency of the statistical framework both for large-scale research of industrial processes and for obtaining detailed estimates are becoming increasingly relevant (OECD, 2017).

It is possible to collect more, and more reliable, information using the analysis of the development of the IT industry at the company level when carrying out business tendency surveys. When modelling the business climate, such timely estimates can accelerate the adoption of strategic corrective actions, especially in post-recessionary or stagnant phases of the business cycle.

Long-term international and Russian research demonstrates that statistical time series and business-climate indicators (BCI), calculated on their basis, are necessary for the integrated and local monitoring of industry tendencies in various sectors of the economy (European Commission, 2017; OECD, 2003). However, in the present, in the practice of countries, there are no published aggregated indicators for the measurement of the IT industry, based on business tendency surveys.

In Russia, for the analysis of the IT industry, a system of nonparametric indicators and the composite index of enterprise confidence (IEC), calculated on their basis, are used. IEC is based on the average estimates of percentage changes in demand for services during the current quarter compared to the previous quarter and the expected changes in demand for services in the following quarter. This index has a wide circulation in the European Community and the Eurozone (European Commission, 2014).

The considerable uncertainty, associated with the digital shift, require direct communication with the participants of the technological process. In this regard, it is advisable to produce research based on the harmonized, methodologically developed statistical tools, allowing to measure key tendencies of the development of the IT industry in near real-time mode.

This paper proposes a technique of behavioural models construction to carry out a detailed structuring of the opinions of heads of IT companies on past, present and future tendencies, on the basis of business tendency surveys of the Russian IT industry. In particular, an algorithm for statistical analysis of business tendency surveys based on multidimensional classification is proposed, which allows building and to analyze behavioural models at the level of concrete objects of observation.

The obtained behavioural models allow us to study data from 2010-17, as an important evolutionary period of the development of the Russian IT industry in terms of emerging reactions to ongoing transformations and the level of flexibility of organizations' adaptive capabilities to various shocks. In particular, the method details the reaction of behavioural models during the period of post-crisis restoration after the economic crisis of 2008 and the subsequent short stage of dynamic development until the stagnation in 2015. The method also shows two subsequent phases of a business cycle until 2017. The results of the technique show the structuring of opinions of heads of IT organizations on planned development in 2018.

In general, the main objectives show that the development of IT organizations is well traced using business tendency surveys. The detailed identification of groups allows a careful situational analysis of the IT industry. It expands the analytical interpretation of business tendencies of the organizations determined by industry indicators; confirms the reliability of short-term forecasts from business tendency surveys; shows an objective reaction to the

arising business tendency shocks in various phases of the business cycle; promotes a more exact measurement of the adaptation potential in the IT industry to business shocks at various phases of the business cycle.

Considering that the IT industry is service-oriented and therefore extremely sensitive to the slightest fluctuations in the economy, the work addresses the problem of studying the behaviour of entrepreneurship at different phases of the business cycle, when aggregated industry analysis using various indicators alone is insufficient and may result in the loss of valuable information. In particular, on the proposed information base, the k-means method was tested to identify clusters of enterprises and study them using behavioural models.

2. Empirical base of research

The empirical basis of this research are the results of business tendency surveys of the organizations rendering IT services carried out during 2010-2017. In particular, these organizations carry out the following kinds of activity: development of the computer software, activity advisory and works in the field of computer technologies, activities for the management of the computer equipment, activities for data processing, rendering of services for placement of information and the activity related with it (Indikatory cifrovoj jekonomiki: 2018, 2018). Results of this activity can be realized both on internal and in foreign markets.

Within the framework of the development of statistical surveys of ICT sphere, since 2010 by the request of Institute for Statistical Studies and Economics of Knowledge NRU HSE, selective specialized business tendency monitoring of business activity of the IT industry organizations is carried out by Autonomous Non-Commercial Organization "Statistics of Russia". The technique of creation of behavioural models offered in this research is based on the sample of the nonparametric data obtained during annual polls of heads of more than 600 IT organizations in 30 regions of the Russian Federation.

The ongoing surveys have a longitudinal nature due to the comparability of their results. The sample of respondents during each poll is a panel in relation to the similar ongoing surveys in the previous periods. All units of pilot business tendency survey keep continuity when forming the sample, providing its multidimensional, stratified nature, and also representativeness on the key economic parameters of thirty regions of Russia.

According to the structure of a sample, the distribution of the reporting economic agents demonstrates the prevailing share of small private IT organizations (more than 70%). The methodology of the ongoing surveys, which is based on the international practice of researches of business climate taking into account the specifics of functioning of the Russian economy, is developed and updated with the use of the scientific and practical capacity of the international organizations and institutes (European Commission, 2014). In particular, the methodology of the ongoing studies relates to some international business tendency surveys, mostly provided by the organizations – members of the CIRET (Centre for International Research on Economic Tendency Surveys).

The business tendency surveys characterizing the conditions of business climate of the Russian IT industry are directed on expeditious receiving from businessmen in addition to official statistical quantitative data of short-term quality standards. The system of nonparametric indicators which is developed and annually updated for these surveys allows to carry out the analysis of the cross interrelations characterizing scales and short-term changes in a modern phase of economic development of the IT industry. The received information represents the main tendencies and dynamics of a situation with the orders for IT services of the organizations, development of the labour market, the main activities, competitive advantages, investment activity, pricing, the factors limiting their activity, and also many other parameters of business activity in this sphere.

Polls of heads of the organizations rendering information and computer services are carried out under specially developed questionnaires "Surveys of business activity of the organizations rendering information and computer services"; which are annually updated according to specifics of the present business tendency conditions. Monitoring is carried out by the method of self-filling of questionnaires by the directors or managers of the organizations possessing the necessary level of competence of the relation of the questions asked in the questionnaire. Selection of the organizations for carrying out polls about business tendencies are carried out by statistical territorial authorities of the state independently.

The system of indicators and the structure of appropriate questions in the programs of surveys of business climate is based on the following methodological principles: questions belong to characteristics of the activity of directly surveyed IT organization; questions reflect the dynamics of indicators in a year; three-category graduation is used on all questions concerning estimates of dynamics of indicators: growth (+), no change (=), decline (–); all information received during business tendency surveys has a qualitative nature.

The group of the variables included in the technique of creation of the behavioural models contains in the section of questionnaires — "Indicators of activity of the organization" and characterize the flowing and expected demand changes; investment activity; competitiveness; economic situation.

3. The creation of the behavioural models

It should be noted that the offered technique based on methods of multidimensional classification allows analyzing various processes of the deep industrial changes which arose owing to influence on the organizations of various on scale business tendency factors (Ajvazjan et al., 1974; Aleskerov et al., 2013; Arhipova & Mhitarjan, 2010). For the first time in Russian statistical practice, being based on the information base of the qualitative type containing estimates of financial and economic activity of the heads of IT organizations, without using the habitual aggregated estimates, changes in behavioral reactions to business shocks are revealed and analyzed. Using the models, the transformation of entrepreneurial mindsets during the business cycle over the last ten years that allowed to raise considerably the existing analytical opportunities of measurement of

business activity and an assessment of a cumulative condition of business climate of the IT industry in general is thoroughly investigated.

At the same time, in this research, it is proved that the cyclical analysis, which, based on calculations of balances of estimates of respondents and composite indicators of business climate is not the only measure of information potential of business survey tendencies promoting a careful analytical study of the industrial tendencies. A similar point of view is found in research studying the practical application and distribution of business polls (Mitchell et al., 2002; Crosilla, Malgarini, 2010). In particular, after the analysis, which is carried out, by Carlson and Parkin in many works, such as (Carlson, Parkin, 1975) the criticism of use only of a balance method of quantification of a final data of surveys was traced. It is necessary to understand the identification of the balance value as the difference of shares of the respondents who noted an increase or decrease of value in any indicator in comparison with the previous period x as a percentage).

Among the foreign researches studying problems of quantification of information, it is possible to note the work of the Italian researchers of ISAE (Proietti & Frale, 2007), based on the spectral analysis of the business climate tendency. The methods of quantification of surveys, in particular, the method of scaling of qualitative signs and their quantification are also discussed in one of the researches of ISAE specialists, (Crosilla et al., 2009) and in the paper of their German colleagues form the IFO institute – CESifo Group Munich, (Pesaran et al., 2015).

The logic of the processing and interpretation of results of surveys is that the initial data appear in the form of distributions of opinions who specified one of answers "increase", "no change", "decrease" or if the indicator is, "above normal level", "at normal level", "below normal level". In the classical theory of measurements, the scale is identified as an unambiguous display of empirical system on the relations in the numerical system with the corresponding relations. Within such questions between the surveyed objects, the sequence relations are established, and the corresponding qualitative signs are measured by a serial scale. Thus, at each point of such a scale, a certain number demonstrating the relative intensity of a qualitative sign is identified (Suppes, Zines, 1967; Pfanzagl, 1976).

International and Russian experience of representation of results of business tendency surveys on large and small businesses shows that the information weight of each separately taken position forming the balance of an indicator represents very important information. A more careful study of such information can represent useful data of various operational indicators of activity of IT organizations. This aspect is especially important when studying the cumulative behaviour of businesses during specific phases of the business cycle and when it is necessary to detail the reactions of businesses to real or expected economic events.

The conceptual framework behind the proposed methodology of behavioural models is close to the idea of the "economic microscope" proposed by Birch (1979). According to it, we should reach beneath aggregate statistics to have a fuller understanding of the way how the behaviour of individual firms causes economic changes. Birch uses different ways of disaggregation, considering separately the economic parameters of businesses of different size, geographical location, industry subdivision etc. Based on the business tendency

surveys data, we exploit another way of disaggregation. It is less structural in its nature: separate groups are identified by their attitudes towards external economic climate and the internal business situation on the basis of cluster analysis. Combining the disaggregation principle of the "economic microscope" with the longitudinal nature of our business tendency data allows us to study the dynamic aspects of the behaviour of firms in the more individualized and specified framework, where firms that are successful, moderate, and unsuccessful in their economic results are studied separately.

As information sources for studying behavioural models, there are primary results (answers in questionnaires) of annual business tendency surveys of the IT organizations used, which are carried out by Rosstat to the period from 2010 to 2017 (8 surveys). The sample for each surveyed period varied in the range of 650 sampling units. As variables, four indicators of business activity were chosen from a form of statistical monitoring as an expert way. An executive of an IT organization, comparing a situation in firm by each indicator during this period with the situation during the previous period and the subsequent with the current year, notes that situation improved, remained the same or worsened. From this, it follows that each firm was characterized by 8 variables, from which 4 are actual and 4 are expected. These include the following: demand for services (x1; x2); investment (x3; x4); company's competitiveness (x5; x6); assessment of overall economic situation (x7; x8).

The basis for a choice of such indicators were the following reasons:

- the part of the indicators from the given set characterizing the actual and expected estimates of respondents are a part of the composite indicator of business climate – an index of enterprise confidence;
- throughout the entire period of carrying out business tendency surveys of IT industry expected short-term expectations of these variables are characterized by the best reference points of enterprise sentiment, and also further prospects of industry development;
- empirical experience of results of business tendency surveys shows that the current and expected (forecasted) estimates of respondents on each of the chosen indicators give complementary information on the position of the organization, give the accurate and coordinated auxiliary characteristic to industrial processes.

When carrying out the classification, the method of k-averages is applied. The formalized description of the algorithm is given below.

S – is a set of clusters, $S = \{S_1, \dots, S_K\}$, where K is the number of clusters. μ_i – is a centroid of the cluster S_i, $\mu_i \in R^N$. There are M objects of clustering, which are IT organizations in this research. (M = 600):

$$X = \{x_1, \dots, x_m\}, where\ \forall j = \overline{1 \dots M}\, x_j \in R^N \quad (1)$$

where $N = 8 * 1 = 8$ (annual data for 2010-2017).

As a proximity measure in this algorithm, the Euclidean metrics were used:

$$\rho(a, b) = \|a - b\| = \sqrt{\sum_{p=1}^{N}(a_p - b_p)^2}, \text{ where } a, b \in \mathbb{R}^N. \quad (2)$$

The classification problem is in the minimization of the total square deviation of objects x_i from the centroid of clusters μ_i and is as follows:

$$\sum_{i=1}^{k}\sum_{x_j \in S_i}\rho(x_j, \mu_i)^2 = \sum_{i=1}^{k}\sum_{x_j \in S_i}\|x_j - \mu_i\|^2 \to min \quad (3)$$

Functionality of quality – the minimization of a total square deviation of objects of x_i from the centers μ_i of clusters of S_i where i=1,2…9. Originally, its ideal representatives, with whom each studied object (organization) is compared, acted as the center of clusters.

As a result of the preliminary analysis, 9 clusters were allocated between three typological groups of companies: high (type A); average (type B) and low potential of business activity (type C).

The group of type "A" is presented by the organizations in which for the considered year positive estimates of these indicators were noted (i. e. businessmen in the questionnaire pointed to increase in demand, investments, competitiveness, etc.). The group of type "B" included the organizations with which during the studied period the dynamics of indicators remained without change of a rather previous year. The group of type "C" is presented by the organizations at which a decrease in economic activity in comparison with the previous monitoring period was observed.

As a result, 9 behavioural groups, together with the task of an initial arrangement of the centroid of the clustering, are presented to (Table 1) ($\mu_1 \ldots \mu_{\forall}$). Each object of the clustering of x_i is characterized by a set of indicators:

= $(sps\_t\_ft, inv\_t\_ft, kov\_t\_ft, eso\_t\_ft, sps\_s\_et, inv\_s\_et, kov\_s\_et,$ eso_s_et) (4)

Table 1

Centroids of clustering

Questions and answers Designation			Behavioural groups								
			TYPE «A»			TYPE «B»			TYPE «C»		
			AA	AB	AC	BA	BB	BC	CA	CB	CC
The actual trend (ft)	Demand	sps_t_ft	1	1	1	2	2	2	3	3	3
	Investment	inv_t_ft	1	1	1	2	2	2	3	3	3
	Company's competitiveness	kov_t_ft	1	1	1	2	2	2	3	3	3
	Assessment of overall economic situation	eso_t_ft	1	1	1	2	2	2	3	3	3
Expected trend(et)	Demand	sps_s_et	1	2	3	1	2	3	1	2	3
	Investment	inv_s_et	1	2	3	1	2	3	1	2	3
	Company's competitiveness	kov_s_et	1	2	3	1	2	3	1	2	3
	Assessment of overall economic situation	eso_s_et	1	2	3	1	2	3	1	2	3

Source: composed by the author

Results of the given technique are involved in the analysis of a condition of business climate of the IT industry for identification and a specification of the behavior of businessmen in the period of the most evident cyclic episodes and business tendency calls during 2010-2017.

4. Findings

According to the presented technique, for the formation of a detailed picture of the evolutionary development of the IT industry, we consider the obtained behavioural models reflecting the reaction of respondents. Along with quantitative indices, the results of the development of the Russian IT industry for the specified period were traditionally represented by the aggregated indicators of business activity that limits possibilities of carrying out expanded analytical interpretation of industrial changes, the decision was made to detail reaction of respondents and to present 8 behavioural models containing results of each business survey to the comparative analysis.

In particular, such timeline and its subsequent analysis covering retrospective results since 2010 in our opinion is an important and necessary condition in the achievement of one of the important research problems which are in the identification of adaptation potential of IT industry by the totals of 2017 that is possible only when comparing the happened changes in entrepreneurial mindsets seven years later. Earlier periods, in this case, are basic, allowing to compare models of behavioural groups of different years and by that to expand an analytical assessment of a condition of IT industry in general.

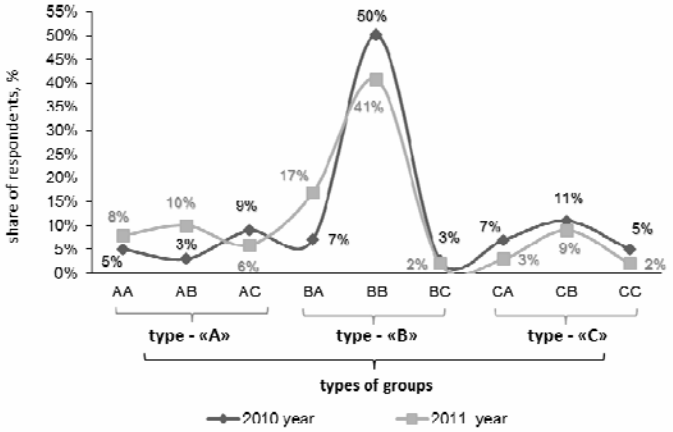
Besides, such extensive time coverage is actual from the point of view of the opening possibility of carrying out the careful comparative analysis between each model reflecting changes in entrepreneurial mindsets on the changing environment or the arising shocks. It should be noted that the development of the IT companies in the studied time interval happened within enough difficult micro- and macroeconomic transformations. First of all, it is about the period of the general unstable business climate in Russia created as a result of the financial and economic crisis of the end 2008 – the beginning of 2009, whose consequences continued to have a negative impact on their positions at the advance of development on the market of the corresponding services within the next several years.

Thus, we consider the behavioural models reflecting changes in IT organizations in groups according to the reaction of entrepreneurs to the post-crisis business tendencies, which developed during the base period (2010-2011).

At estimation of the received behavioural models, specifically, we track the distribution of the organizations not only possessing high and low potential (type "A" and "C", respectively), but also the surveys making throughout the entire period the most stable group "B". Figure 1 visualizes the behavioural models reflecting groups of the organizations according to their reaction to economic changes in 2010 and 2011.

Figure 1

The changes in the behavioural models of IT organizations (2010-2011)



Source: composed by the author.

Proceeding from the received groups, it is possible to draw a conclusion that in 2010 and 2011 the majority of firms (60% on selection) belonged to type "B" and were concentrated around a neutral position on the relation as to the current estimates, and short-term expectations. However, in 2011 in the group with neutral answers there was an expansion of the BA group reflecting a growth in neutral/positive mood of respondents.

The signals of improvement of a situation in a segment were also given by changes in groups "A" and "C". So, if in 2010 the general share of the organizations in group "C," which heads gave mainly negative estimates to the developed tendencies and expectations, made 23%, then in 2011 their share decreased to 14%. At the same time, the general share of the successful organizations increased from 17 to 26%. In addition, in all groups, the tendency of growth of positive estimates concerning prospects of development of the companies in 2012 was noted. Thus, proceeding from Fig. 1, it is possible to draw a conclusion that the IT industry in 2011 followed in a waterway of the stabilization post-crisis measures which caused functioning of business in more favourable market conditions.

Nevertheless, despite 2011 sated with post-crisis compensation activity, it would seem to put all prerequisites for further formation of IT industry for future periods, in 2012 the economic situation began to become aggravated. Dynamics of development of the companies was slowed down, and the come period was rather conservative.

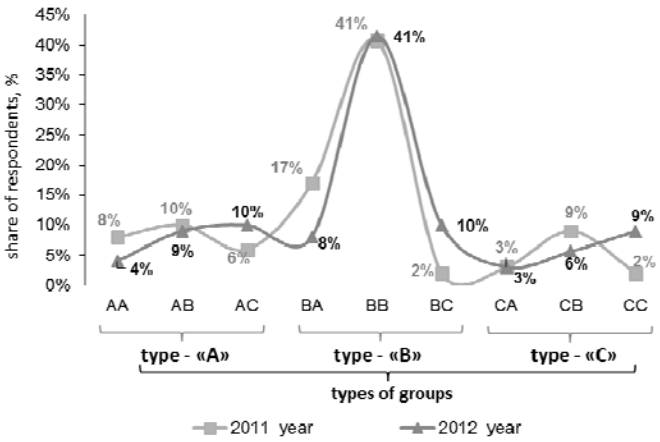
The happening changes in 2012 and 2013 rather brightly reveal in behavioural models that reflect changes relatively 2011.

Based on the distinction among the groups described above, we examine Figure 2. In all groups, the increase of pessimism in answers respondents is distinctly traced and growth of

groups with negative estimates is recorded. Therefore, relatively 2011 the AC group in 2012 increased from 6 to 10%; "BC" – from 2 to 10%; "CC" – from 2 to 9%. However, in general, the group "A" decreased slightly: from 26 to 23%. Growth of a share of the companies of type "C" made from 14 to 18%.

Figure 2

The changes in the behavioural models of IT organizations (2011-2012)



Source: composed by the author.

Thus, based on Fig. 2, we can conclude that the resumption of growth in business activity was accompanied by the willingness of companies in other sectors of the economy to invest in modern IT technologies in order to increase the efficiency of their business. One of the clear positive trends that ensured a relatively stable development of companies in the IT services market in this period should be attributed to the continued implementation of the pent-up demand for services that had accumulated both in the crisis and in the recovery period, which contributed to the further "mothballing" of not only many suspended large projects, but also the introduction of new ones.

Stagnation, which swept the enterprises of the real sector of the economy as main customers of services during 2013 and 2014, actually caused a subsequent rigid correction and compression of the IT market. Thus, if the last periods can be characterized as "resuscitation and recovery", 2014 became critical for the industry.

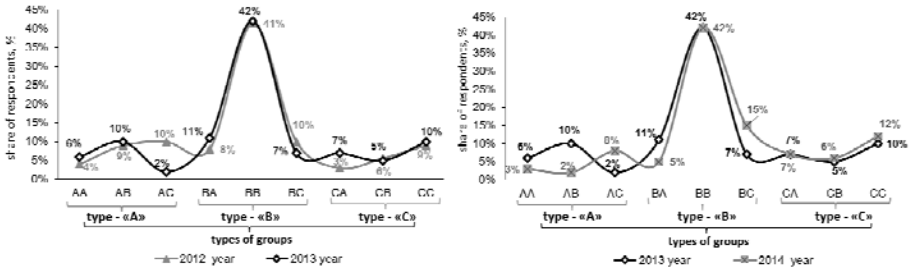
Similar changes also showed particular behavioural groups, as presented in Figure 3. Careful analysis of enterprise intra-group estimates indicates pessimistic sentiments of respondents in each type of the organizations concerning short-term prospects of development of business. In all intra-industry groups, in 2014 the pessimistic sentiments regarding industry rates of development in 2015 were noted. In each cluster, accumulating estimates of the expected changes for the next year (AC, BC, CC), traced signals about a new phase of economic reduction. This tendency especially was shown in group "C".

Validly, according to the further chronology of the development of the industry, 2014 is the last moderately positive period for IT market.

Thus, the visualization of behavioural groups shows that opinions of businessmen in 2014 were enough sensitive measurement not only for current, but also for future industrial changes. Against the background of the sharp deterioration of a condition of the business climate, there was a regrouping of forces among IT organizations and the corresponding change in the behavioural models (Figure 4).

Figure 3

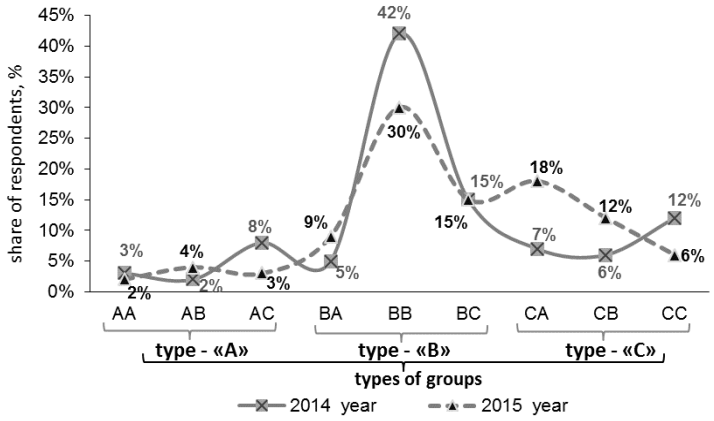
The changes in behavioral models of IT organizations (2012-2014)



Source: composed by the author.

Figure 4

The changes in the behavioural models of IT organizations (2014-2015)



Source: composed by the author.

Concerning clusters "B" and "C", the group "A" that collected IT organizations, which had the highest potential of development, shrinks considerably. The share of such organizations in 2015 for all sample decreased to unprecedentedly low 9%, having established the second anti-record (even in 2010 the minimum value made 17%).

At the same time, the happening changes in the behavioural models reflecting a significant increase in comparison with 2014 in a share of the organizations, which got to a cluster "C", to 36% are presented.

Against two presented groups, a certain optimism causes a condition of the group "B" that included IT organizations, whose heads remained insensitive to current changes and were rather positive to the expected changes in business tendencies. Though this fact is a little levelled by a decrease in BB group from 42 to 30%, in general in group "B" the maximum majority of the companies (54%) continued to concentrate being characterized by primary resistance to an external environment.

Nevertheless, the specification of each group allowed noting that in 2016 there would be favourable changes. First of all, it is reflected by such groups as – "CC", the share of the companies in which in 2015 decreased to 6 against 12% and "CA" – growth to 18 against 7% in 2014, and also "AC" – decrease from 8 to 3%, respectively.

In 2016, rather noticeable compensation processes that were expressed in a change of negative dynamics of the indicators characterizing business climate are revealed. Positive changes are distinctly visualized by comparing behavioural models of 2015 and 2016 (Fig 5.). Thus, the adverse business atmosphere, characteristic for 2015 in the Russian IT industry, considerably improved, and depressive estimates of heads in 2016 were replaced with more optimistic. Tactical realities, acting as a platform for a creative, continued to increase resistance to stress and adaptability of the IT organizations.

According to the survey conducted in 2017, this industry for the first time since 2014 returned to positive growth rates having shown positive development tendencies. The depressive estimates of respondents created in last surveys considerably were levelled that promoted noticeable updating of the current and expected tendencies.

Changes in the behavioural models of 2015 and 2017 illustrate a rise in IT and a levelling off of negative tendencies. In each group (Figure 5.), the positive regrouping of IT organizations is expressed in the doubling, relative to 2015, of the proportion of successful companies from 9 to 18%, and in the noticeable shrinking of the group "C" from 36 to 8%. It should be noted that the reached values are the best according to the nature of the happening processes since 2010. The behaviour of the type B companies representing group "B" which increased from 54 to 74%, emphasizes their adaptation opportunities to the fast economic restoration and their subsequent growth also attracts attention. This fact shows that as of the end of 2017, despite internal restructuring and continuous optimizing reorganization of administrative schemes in practically all industries of the economy, the Russian IT market shows high rates of development.

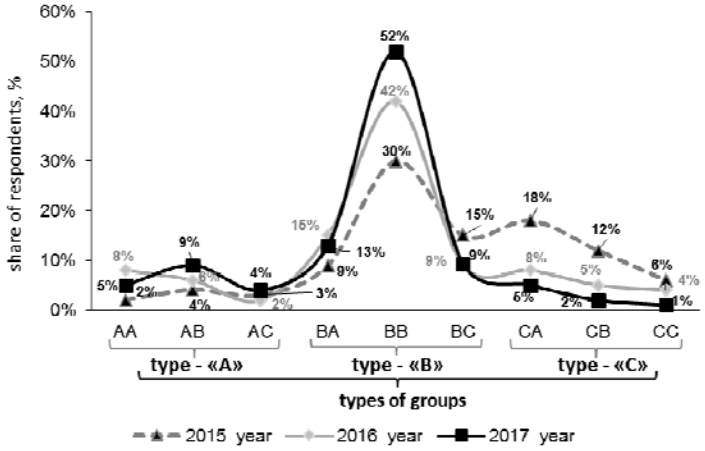
Based on the specifics of the results, it is possible to conclude that the observation over a share of "neutral" answers of respondents (group "B") prevails over the remained, fluctuating from 60% to 75% during 2010-2017.

On the example of comparison of the changes happening to IT organizations within two cyclic episodes in 2011 and 2017, we see that maintained neutrality of developing business tendencies is an important feature as this group is the most representative. This is an important indicator of the general potential and degree of adaptability of businesses and

allows the concretization of the potential level of IT companies in the current and retrospective phase of development. In particular, this demonstrates the exclusive mobility and quick adaptation of the Russian IT industry to the changing conditions in the post-crisis periods 2010 and 2011, and in 2017, after the recession of 2015.

Figure 5

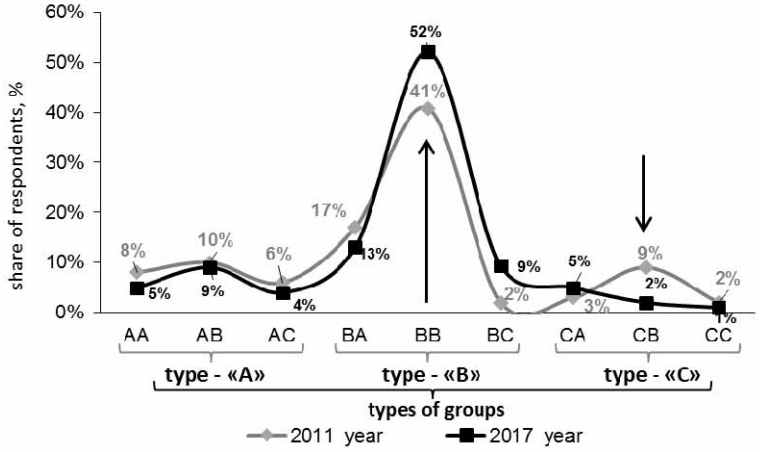
The changes in the behavioural models of IT organizations (2015-2016)



Source: composed by the author.

Figure 6

The changes in behavioral models of IT organizations (2010-2017)



Source: composed by the author.

It should be noted that despite expeditious restoration after the crisis in 2010 and 2011 the share of IT companies which were concentrated on a neutral position on the current estimates and short-term expectations was much lower than in 2017. The expansion of group "B" which began in 2016 and continued in 2017, having made 74% against 60% in 2010 allows to note that the enterprise potential and adaptability to macroeconomic fluctuations became considerably stronger (Figure 6). This represents a significant shift from the situation at the beginning of 2010s, when in the context of Russian specifics there was no such prevalence of IT services and the demand for them was more vulnerable to the external socioeconomic conditions than in the second half of 2010s.

The results confirm that such a disaggregated manner of analysis of survey results can be useful during any period, but is most effective at a time of expansion, destabilization, and compensation restoration. When sharp transformations of enterprise estimates are possible, aggregation can lead to a loss of valuable information at the firm level.

5. Conclusions

The growing importance of the IT in the economy, as well as the digital transformation of the society, necessitates studying the key trends of its integral component – the IT industry, which is characterized by a high rate of change. The rapid spread of IT services, which are integral engines of the information society, makes it increasingly difficult to identify and monitor current and emerging trends in this market. Abrupt transformations require flexible and modern statistical tools that can quickly and comprehensively reflect the results of the activities of IT service providers.

In this work, using cluster analysis, a detailed structuring of the opinions of IT company leaders regarding current and future industry development trends during 2010-2017 is carried out. The detailed identification of groups and their analysis using the proposed behavioural models' technique allowed to conduct a thorough situational analysis of the IT industry, which:

a) expanded the available information about the IT industry trends in comparison with the traditional methods of aggregation into simple and composite indicators;

b) confirmed the reliability of short-term forecasts of entrepreneurial estimates obtained in the course of business tendency surveys;

c) revealed the increase in adaptation potential of the IT industry during 2010-2017.

In each considered time interval, the ability of various groups of IT companies to provide an objective response to emerging market shocks was confirmed, which once again emphasizes the high significance, objectivity and relevance of conducting business surveys at any phase of cyclic development.

A detailed visualization of models revealed and concretized the behavior of all the designated groups of entrepreneurs during various periods of the business cycle. In particular, a comparison of the models of enterprise groups in 2010 and 2017, allows us to conclude that in general, the Russian organizations rendering IT services considerably

strengthened their economic potential and increased their adaptability to the arising shocks of recent years.

Based on the specifics of the results obtained, we can conclude that it is equally important to monitor the proportion of "neutral" responses of respondents (group "B"), which, as a rule, prevails over the remaining ones. A comparison of the changes taking place with IT organizations in the two cyclical episodes of 2011 and 2017, which remained neutral regarding the current situation, can be very useful, since this group, as the most representative, is an important indicator of the overall potential and degree of adaptability of entrepreneurs.

Considering the increasing significance of the IT industry for the Russian economy and the conditions of frequent destabilization of business confidence, the integration of this method into statistical practice is relevant for the development of additional operational anti-recessionary measures and the stabilization of political decisions. In this regard, the practicality of the results and the subsequent analysis lies in the use of this method as an instrument of modelling the IT industry's future profile, improving conditions for its accelerated transformation. Particularly, new indicators and indexes may be analyzed in further research, revealing the aspects of digitalization, digital activity of companies, demand and supply for particular digital technology services.

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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CORPORATE SOCIAL RESPONSIBILITY AND INNOVATION – THE MEANINGFUL CONNECTION

The purpose of this study is to present the relationship that exists between the Corporate Social Responsibility concept and the innovations realised by companies. The connection is determined by corporate culture and is linked to overall organisational performance. The fundamental theoretical statements of the above constructs are outlined, as well as the relationship that exists between them. The importance of the CSR – innovation relationship is formulated. The theory is exemplified by a case study of a real Bulgarian company, VB Studio Ltd.
The conclusion is that understanding the essential importance of the two-way link between the implementation of innovation in the context of CSR leads to an increased overall organisational performance by meeting specific public needs, and current general needs encourage the generation and introduction of innovation.
JEL: M14; O30

Introduction

Modern companies are operating under the conditions of constant change. Maintaining and enhancing their competitive advantage requires appropriate management related to trending monitoring and analysis, as well as the ability to provide relevant feedback to take the company to a new level of competitiveness.

The trends that organisations need to follow are also related to changes in the behaviour of stakeholders who have increased demands on them in terms of socially responsible practices, transparency, generating and maintaining trust.

According to the CSR concept, companies are no longer just producers of goods and services; they are active participants in public regimes of communities and societies. Companies function as networks – all of their key stakeholders are co-actors in value creation. They seek to generate the trust that underpins social capital, leading to a positive reputation and, from there, to increasing overall competitive performance. *Okwemba et al. (2014) stated that CSR is an effective strategy to protect the company from risks and corporate scandals.*

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The CSR link is a necessary prerequisite not only for fostering competitiveness but also for establishing organisations as legitimate corporate citizens.

The main drivers of the CSR concept can be identified as internal and external. Inside, leadership stands out, mostly as ethical (Kotter, 1996; DeSimone, Popoff, 2000; Gill, 2003). The corporate culture and shared values and their alignment with social needs and expectations (Porter, Kramer, 2006; Lee et al., 2013), the reputation, moral and ethical aspects of responsible organisational behaviour have a significant impact.

Among the external ones are the legal, political and economic regulations that support the implementation by companies of policies and standards in the context of the CSR Concept; access to resources, growing societal expectations and demands, environmental issues, opportunities for interaction between different social and organisational actors.

Innovations and their management are becoming an essential part of the vision and strategy of the organisation that seeks to maintain and enhance its competitiveness.

The more the organisation is understood as a "boundaryless organisation" the easier it is to bring innovations, because organisations that are involved in different networks and strategic partnerships are much more innovative than those, which are more limited than interactions. All collaboration across a broader set of stakeholders in the macro and the micro organisational system is needed to deliver sustainability.

Systematic Approach and theories to Corporate Social Responsibility

Today's companies are under increasing pressure to maintain socially responsible behaviour towards stakeholder groups relevant to their existence. The CSR link is a necessary prerequisite not only for fostering competitiveness but also for establishing organisations as legitimate corporate citizens.

In this regard, we will briefly explain the characteristics of the corporate social responsibility domain, focusing on its relationship with business ethics and the concept of sustainability.

The concept of CSR is directly related to business ethics. Business ethics (Ferrell, Crittenden, Ferrell, Crittenden, 2013) and social responsibility are viewed from a normative and descriptive perspective. Most researchers use them as interchangeable concepts (Fassin, Van Rossem, Buelens, 2011), but there are exceptions to Weller's (2017).

The connection between two concepts can be found in the following ways – meeting the expectations of critical stakeholders and enhancing the confidence, creating and maintaining a work environment shaped by the ethical values that build the corporate culture. It guaranteed equal opportunities for professional and career development for employees, protection against unethical actions of competitors and employees, involvement and assistance in solving problems of the local community. Mentioned is the needed integration of CSR principles into the overall policies and strategies of the organisation.

The society in which organisations carry out their activities has specific regulations, subject to standards of conduct and laws that must be strictly adhered to (Jourdan, Kivleniece, 2016). Ethical responsibility can be defined as "a corporation's voluntary actions to promote and pursue social goals that extend beyond their legal responsibilities" (Carroll, Shabana, 2010). It is related to what organisations do correctly (Grbac and Loncaric, 2009). By embracing ethical responsibility, organisations outperform economic and legal regulation by voluntarily agreeing to meet public expectations (Longo et al., 2005).

The concept of CSR is based on the idea that business is part of society and must manage its actions in a way that allows it to co-exist with different stakeholder groups (Freeman et al., 2004). CSR is understood as the organisation's response to social pressure, environmental concerns and stakeholder needs (Crisostomo et al., 2011). Filho et al. (2010: 296) conceptualise CSR as "a form of management that is defined by the ethical relationship and transparency of the company with all the stakeholders with whom it has a relationship with as well as with the establishment of corporate goals that are compatible with the sustainable development of society, preserving environmental and cultural resources for future generations, respecting diversity and promoting the reduction of social problems". CSR provides many different benefits to companies operating in its context. It minimising conflicts with stakeholders and enhancing their loyalty, enhancing competitive advantage, enhancing corporate reputation, financial revenue, improving product and service quality, innovation, similarity and retention of competent employees (Morrison-Paul, Siegel, 2006; Mozes et al., 2011; Ali et al., 2010; Buciuniene, Kazleuskaite, 2012; Cegarr-Navarro, Martines-Martines, 2009).

Another concept related to CSR is that of sustainability. The border between the two is fragile because they are too close and overflowing with each other. Van Marrewijk and Werre (2003) add resilience to the well-known "Profit, People, Planet" model. Van Marrewijk (2010) recommends that both CSR and sustainability if differentiated, distinguish CSR from transparency, stakeholder dialogues and official documents intended for them. Sustainability focuses on values, value systems, environmental issues, human resources management. Sustainability is a significant factor in the CSR dimension associated with stakeholders. It requires companies to take responsibility for their direct or indirect actions towards the various groups related to the company.

The current state of CSR theory is influenced by various theories – institutional theory, the resource-based view of the firm, agency theory, stakeholder theory, the theory of the firm (McWilliams et al. 2002; Windsor 2006). the result of which are different conceptualisations of CSR.

What is the essence of the Corporate Social Responsibility Concept?

Corporate Social Responsibility (CSR) is a corporate governance philosophy that transforms companies into active participants in overall social development. An essential element of corporate strategies of socially responsible companies is respecting and acting by the interests of their stakeholders – shareholders, employees, customers, suppliers, the local community, government institutions, non-governmental organisations, etc. In short – Corporate Social Responsibility and perception in line with the postulates of the People,

Planet and Profit model, which expresses respect for the interests of stakeholders, the management of processes in an organisation in the context of sustainabile development, the increase in profits in proportion to the rise in social welfare.

Mentioned requires that the components of social responsibility become the values, norms and underlying assumptions of the corporate culture. Most CSR dimensions are defined as ethical. The culture of the organisation determines the attitude to different trends – problems, opportunities, challenges and ways of acting towards or according to them.

One of the most popular definitions of CSR is that of Carroll (1991), who defines it "the corporate social responsibility of business as a harmonious continuous interaction of economic, legal, ethical and philanthropic responsibilities". *To the three most popular dimensions of CSR – environmental protection, social and economic dimensions of business, two more appear in the contemporary research literature – the voluntary aspect of dimensions and stakeholders dimensions.*

In the light of this Van Marewijk (2003) understands CSR as an integrated process within which each organisation must select its specific sustainable goals to more easily adapt to the changes and challenges arising from the business environment. Voluntary dimension focuses on the ethical and philanthropic aspects of CSR. Business ethics must also be understood following CSR dimension. Companies also have a significant responsibility to avoid corporate social irresponsibility.

Companies adopt and act on CSR principles to maintain their relationships with stakeholders. Their perception is accompanied by a change in corporate culture. Many companies want to comply and fulfil their social commitments, but not to internalise CSR values. However, other companies take a more holistic perspective and see action in the context of CSR as an opportunity to change the corporate culture towards a culture of innovation (Azzone, Noci, 1998).

In the context of what has been said one of the most comprehensive definitions presents CSR as the process of integration in organisational activities of social, environmental, ethical and human concerns from their interest groups, with two objectives: (1) to maximise value creation and (2) to identify, prevent and mitigate the adverse effects of organisational actions on the environment (European Comission, 2011). The definition presented emphasises the importance of the stakeholders, the creation of value and the implementation of activities related to raising public well-being and environmental protection.

In short, the concept of CSR represents a strategic advantage for the organisation it has adopted. It is a significant source of competitive advantage, as well as the conditions for its enhancement. Through its socially responsible activities, it maintains positive relationships with relevant stakeholder groups (Hess, Rogovsky, Dunfee, 2002).

The challenge of integrating CSR into an organisational strategy can be addressed in several ways – in terms of corporate culture – related to changing and optimising values, norms, beliefs and core assumptions. In terms of innovation, change is linked to opportunities for learning, free sharing of knowledge, participation and empowerment, through which to develop the capabilities of the organisation's members and build on the

corporate culture – regarding the organisation's actions as a corporate citizen, adequately involved in public regimes. Communication on CSR practices of the company to its internal and external stakeholders should not be underestimated here. It is essential for a modern learning organisation (Senge et al., 2004). Mentioned is connected with the view of Steinthorsson's and Söderholm's (2002), that states an organisation co-exists with its environment and unique co-creates relationships with it.

Directly related to the CSR concept is the domain of corporate culture. Corporate culture is the invisible infrastructure of an organisation where all other constructs and elements exist.

Embracing the concept of CSR by companies requires the existence of a corporate culture that is characterised by opportunities to respond appropriately to the social needs and expectations of society, its ethos and its legal protection. These priorities should take into account both corporate and company development strategies, and they should be at the heart of the overall corporate policy.

Adoption of the principles of CSR requires that the company inevitably changes its business ethics. That process depends on the individual values of the members of the organisation and the corporate culture postures that senior management introduces, as well as the principles that are formalised and act in the organisational reality (Welford, 1995, p. 29). We can note that the changed business ethics also harmonises with a change in the corporate culture that is "in line with the concept of sustainable development" (Welford, 1995, p. 114). As the concept of CSR is multifaceted, the change of corporate culture should be carried out at all levels (Schein, 1992) to successfully adopt practices in line with CSR and adaptation of organisational behavior to them (Linnenluecke, Griffiths, 2010).

There are various studies in the academic literature on the relationship between corporate culture and CSR (Maon, Lindgreen, Swaen, 2010; Ubius, Alas, 2009; Strautmanis, 2007; Trevino, Nelson, 2007; Maignan, Ferrell 2004; Doppelt, 2003). Corporate culture is also closely linked to stakeholder theory (Wood, 1991; Jones et al., 2007; Maon, Lindgreen, Swaen, 2010). Several authors have argued that corporate culture and the value system shared by members of the organisation largely determine the acceptance of CSR principles and the actions of members of the organisation in harmony with them (Collier, Esteban, 2007; Maignan, Ferrell, Hult, 1999; Van Marrewijk, Werre, 2003).

The concept of socially responsible organisational culture is relatively new in the field of organisational studies (Hemingway, 2013), but it must find real expression in business organisations. At the heart of the concept is the significant connection between exposed values and corporate actions and processes. There is also a growing interest in the study of the essence of a socially responsible organisational culture in research circles. The construct needs refinement and emphasis on its role in the overall development of organisations (Ganescu, Gangone, 2017). We may conclude that corporate culture is an essential determinant of the ethical behaviour in the organisation.

More and more organisations are measuring their performance with the help of not only hard metrics but also the influence of soft factors and "intangible values".

Jaakson, Vadi, and Tamm (2009) conclude that organisational performance mediates the link between corporate culture and CSR. Organisations with a well-managed corporate

culture initiate policies related to CSR initiatives designed to enhance the well-being of stakeholders.

Obligations related to responsibility and ethics are fundamental to corporate culture. The value system allows to rank situations, actions and ideas as ethical and unethical. According to Carroll (1991), the moral responsibility of the company is part of CSR. Innovative attitudes are part of the culture of the organisation. A socially responsible corporate culture must create a climate that fosters creativity and innovation to provide organisational and stakeholder needs.

Organisations can strengthen their culture through socially responsible actions and contribute not only to enhancing the sustainability of their business but also to creating a sustainable business.

In connection with the above, Tsai and Yen (2008) propose that organisational performance be measured through social and innovative production, in addition to financial and market performance. Mitchell (2002) formulates four dimensions for measuring organisational performance, which include – relevance to meeting stakeholder needs, efficiency and effectiveness of the company, financial performance. According to Lee (2008), organisational performance can be measured by stakeholder satisfaction, corporate communication, teamwork, strategic performance, knowledge management and organisational growth. External and internal factors influence the performance of the organisation. Internal ones include corporate culture, management style, HRM policy. External are market perceptions and preferences, the economic situation in the country, specific rules and regulations (Mirza and Javed, 2013).

We can agree that the concept of CSR is a multidimensional construct. It is directly linked to different ideas and organisational theories, some of which we will look at, as well as their relation to innovation.

Innovation

The goal of each company is the creation of value, and the essence of innovation lies in the renewal of companies' businesses to maintain and positively exploit the competitive advantage as well as to increase the value creation potential (Hax, Wilde, 2003). In general, innovation is defined as the introduction of inventions, as well as processes generating new results (Gloet, Terziovski, 2004). According to Michael Porter (1990) "…innovation is the only way to maintain a competitive advantage". He believes that innovation is the result of much more organisational learning rather than formal research and development, i.e., of the continuous improvement that is at its core.

The choice of an organisation's innovation strategy is influenced by internal and external factors, related to the characteristics of the organisational nature and the environment in which it operates (Dodgson, Gann, Salter, 2008).

In the OECD's Oslo Manual (2005) states that there is no need innovation to be something significant new market and be a minimum of unique or significantly affected by the

organisation improvement. Innovation is "the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations..." (OECD, 2005, p. 46). Mentioned is consistent with the incremental and radical aspects of innovation.

Innovation is a unique source of competitive advantage (Wang, Ahmed, 2004).

Increasingly relevant regarding turbulence and uncertainty in the business environment that and require constant application of new approaches to adaptation and competitiveness of the organisation through active interactions with customers, suppliers, users, research organisations, competitors, is the concept of open innovation. Open innovation is expressed in the ability of organisations to overcome their limitations and to embrace the knowledge and technology of their environment (Chesbrough, 2003; 2006). Open innovation is also associated with the implementation of an open strategy. It consists of creating and implementing a policy as a result of the interaction between internal and external expertise, between all organisational stakeholders.

In the light of this, it is necessary to emphasise that stakeholder theory is one of the most fundamental topics in CSR-related research (Carroll, 1991; Clarkson, 1995; Friedman, Miles, 2006; Jones, Wicks, Freeman, 2002; Wood, 1991). It sets out a framework for assessing CSR through the social activities implemented by the company. The innovations are also intended to contribute to meeting the needs of stakeholders.

The ability of an organisation to create and maintain relationships with all its key stakeholders in continuous interaction and continuous commitment guarantees not only its long-term existence but also the generation, management and enhancement of its value creation capacity (Post, Preston, Sachs, 2002; Clarkson, 1995). Freeman, Harrison et al., (2010, p. 263) even suggest replacing the term "corporate social responsibility" with their idea of "company stakeholder responsibility", which implies a new interpretation of the purpose of CSR practices.

The idea is adequate to the primary purpose of CSR, which is to create value for key stakeholders in fulfilling the company's responsibilities to them. This idea examines business and society in their interconnectedness and determines that when relationships with stakeholders are managed competently, they will increase the competitive advantage of the company. In this regard, it is necessary to be aware of to whom precisely the organisation has specific responsibilities and what their nature is Jensen (2001).

In recent years, the theory of "shared value" has been affirmed in the specialised literature as a concept directly related to CSR and the enhancement of the company's competitive advantages. The shared value created by the organisation must be maintained through CSR programs that emphasise values that align with crucial stakeholder concepts (Maignan, Ferrell, Ferrell, 2005). Porter and Kramer are significant proponents of shared value theory. *Porter and Kramer's (2011) definitions of shared value, relates companies policies and operating practices that enhance its competitiveness and in the same time advancing the business and social conditions in the communities in which it operates and is strictly is related to corporate governance (Dimitrov et al., 2014). Thus, the concept of shared value*

connects it with the strategic importance of social good as an objective of business, which is an integral part of corporate governance. Therefore, CSR and shared value can link increasing company performance to creating benefits for society as a whole.

Shared value is a necessary precondition for economic success. Shared value helps rediscover products and markets by reformulating productivity in the value chain and creating clusters – i.e. the transformation of the value chain into a value network, which in turn facilitates innovation. Porter and Kramer explicitly state that CSV replaces CSR as philanthropy is driven by external pressure that focuses on the company's reputation. At the same time, CSV's goal is to generate cost-benefit economic and social profits as a basis for maximising profit while creating value in the community *(Dimitrov et al., 2014)*. Innovation is directly related to value creation.

Corporate communication is an integral part of managing stakeholder relationships. In principle, every organisational strategy is accompanied by a communication strategy.

Corporate communication, in the context of CSR and innovation, builds, manages and maintains the corporate reputation of social responsible company. Company disseminating information that not only draws attention but also encourages proactive actions by stakeholders to promote the harmonisation of different social values (Kuhn, Deetz, 2008, p. 190) and support its functioning as a socially responsible actor.

A key aspect of CSR and innovation is the way companies interact with their stakeholders (Huijstee and Glasbergen 2008; Neville and Menguc 2006). It must be transparent, with the presumption of values around which all are united and in the context of constant dialogues and debates. The latter are seen as mediators between the organisation and the stakeholders, helping to understand the messages. The concept of stakeholder engagement is broader than that of stakeholder dialogue and is essential for engaging them in the affairs of the organisation (Erdiaw-Kwasie et al., 2014).

CSR postulates that the organisation exists in a stakeholder network, meets potentially conflicting interests, and translates those interests into CSR goals and policies.

Often organisations try to change the expectations of their stakeholders (Lamberg et al., 2003). To achieve CSR, organisations need to carry out formal and informal dialogues and initiate practices related to increasing engagement and supporting the company's strategic actions. The ultimate goal of the meeting is to build and manage mutually beneficial relationships with relevant stakeholder groups (Maak, 2007) and to create value for the long term (Morsing, Schultz, 2006). Stakeholder dialogue reduces scepticism about their authenticity, which translates into a return on investment raising the financial and non-financial performance of the company (Golob, Podnar, 2014: 248; Amaladoss, Manohar, 2013).

Positive relationships with stakeholders are a guarantee of maintaining an organisation's competitive advantage (Andriof, Waddock, 2002; Post et al., 2002; Johnson-Cramer et al., 2003).

Innovation and CSR

Innovation is an opportunity to create conditions for seeking and generating better solutions (Martins and Terblanche, 2003). The prospect of balancing the social and economic dimensions of CSR can be viewed in the light of the importance of social influence between different stakeholder groups, which can be achieved by creating innovative tools and communication channels to provide and encourage feedback (Clark, 2000).

Various researchers (Cohen, Winn, 2007; Schaltegger, Wagner, 2011) emphasise the intermediary role of CSR in the organisation's ability to innovate.

CSR initiatives lead to innovation through the use of social, sustainable or environmental mechanisms through which they create new ways of working, new products, services, processes and marketing strategies (Little, 2006). Many companies are redefining their business models because they view CSR initiatives as an opportunity to increase their competitiveness and to streamline HR management.

The concept of innovation involves developing and implementing new combinations of resources to create and add value to the organisations that generate them, and to enhance the well-being of stakeholders (Drucker, 1985; Baldwin, Curley, 2007). It can be found in various forms (product, market, process, social innovation), stemming from different sources (closed and open innovation) and associated with different aspects of change (incremental, radical, disruptive) (Chesbrough, 2003; MacGregor, Fontrodona 2008). As early as 1984, Drucker emphasised the enormous potential of turning social problems into business opportunities, economic benefits, human capital competences and the public good (Prahalad, 2005; Prahalad, Hart, 2002; Fox, 2004; Bendell, Visser, 2005). An excellent example of the link innovation – CSR is the "innovation sandbox" created by Prahalad (2012). By focusing on managers' attention on 4 A's – awareness, access, affordability, and availability, resource constraints can be overcome, and an environment conducive to innovation is created. The implementation of the concept of "innovative sandbox" requires the creation of new business models, the result of which is to increase the competitive advantages of companies by satisfying significant social needs.

At this stage, the relation between CSR and innovation has not been sufficiently studied in the scientific literature, where the main focus is still on conceptual assumptions (McWilliams and Siegel, 2000), which are supported by limited empirical studies of the relationship between the mentioned concepts (Locket et al., 2006). Based on the existing academic research, we can conclude that the link between CSR and innovation is two-way, because on the one hand it strengthens and promotes the company's reputation and, on the other, contributes to resolving environmental and social problems.

The link between innovation and CSR promotes organisational change and requires a holistic management approach that responds to sustainability challenges (Roome, 2011). The pursuit of innovation has a positive effect on organisational performance and sustainability (Chandler et al., 2000; Zahra, Covin, 1995). Grayson and Hodges (2004) note that the company-specific instinct for competition and entrepreneurship drives them to come up with innovative solutions in non-traditional CSR domains. Porter and Kramer

(2006; 2011) support the need to strengthen the link between CSR practices and business strategy, in a way that facilitates innovative solutions to improve public well-being and company itself enhances its competitive advantage. It is the placement of CSR at the heart of the company's strategies and vision that successfully supports the company's innovative efforts. Teece (2007; 2010), based on the theory of dynamic capabilities, emphasises the ability of senior management to articulate creative responses to socio-economic challenges through CSR-related conditions and problems. In the context of this, the positive relationship between CSR and innovation has been found in several academic studies, such as Surroca et al. (2010) consider that intangible resources (associated with innovation) are the missing link in explaining the CSR-financial relationship.

Empirical studies on the relationship between innovation and CSR also indicate that it has a positive impact on value creation and some management strategies, such as innovative ones (Husted, Allen, 2007; Trebucq, Evraert, 2008). The link between research and development, one of the essential elements of innovation and CSR, with companies applying CSR principles to their production systems, requiring modification of the application technologies themselves and incorporating R&D expenditures (Siegel, 2001; Bansal, 2005). In their research, Gallego-Alvarez and colleagues create a two-way model in which the innovations realised by companies are a function of CSR practices, the sector in which they operate their size and the risk that exists. In the other direction, CSR practices are the result of innovation, the field of activity, size of companies and degree of risk. The effects are adverse to the two-way relationship. Still, they find that investing in socially responsible activities adds value after three years and the relationship that exists between CSR-related practices and innovation is different for the diverse sectors in which the companies surveyed operate. A research study of Graafland and Noorderhaven (2019) shows that the intensity of technological competition influences the strategic motivation of European managers to engage in CSR. MacGregor and Fontrodona (2008) examine the CSR-innovation relationship in European companies and find that CSR-driven product and service innovation emphasises social benefits, while values and social-driven solutions questions drive CSR-driven innovation (cited in Szutowski, Ratajczak, 2014).

The conclusion that can be drawn from what has been said here is that the relationship that exists between innovation and CSR practices needs further in-depth theoretical and empirical research to formulate specific parameters for its measurement and to characterise its nature in particular.

Creating socially responsible practices and actions help the company generate innovations and new resources through which it establishes know-how and enriches its corporate culture. The result is economical, and it is reflected in increased performance while meeting the needs and demands of stakeholders. The company can generate and innovate that can help to strike a balance between stakeholder interests.

One type of innovation, directly associated with CSR, is the responsible innovation.

Responsible innovation is a concept that builds on ethical and social commitments made before the start of innovation processes. Stakeholders are encouraged to become involved and to take collective responsibility for managing innovation in an ethically acceptable, sustainable and socially acceptable way. In this way, innovation will have more significant

social benefits. In the context of responsible innovation, science and innovation are called upon to contribute to the well-being of future generations through their achievements today. Social and sustainable innovation also aims to respond to societal challenges. They are a transparent, interactive process between those who involved in, who become mutually responsive in other with the creation of an ethical, acceptable, sustainable innovation process and its products (Owen et al., 2013).

The goals that are set in innovation networks can be more successfully achieved when different stakeholder groups share similar values or when they tend to overcome the difference to achieve the goals. The diverse expertise of the participants in the innovation network is also essential for the achievement of the objectives. Making and managing high levels of engagement and dedication is more successful when information is shared – between the organisation and its stakeholders. Information sharing and transparency are mandatory, but organisations need to be selectively 'open' – i.e. to emphasise what information to share, from what perspective and to whom.

Several studies indicate that companies are engaged in dialogues with different stakeholders. Improving dialogues and debates with stakeholders is done through an emphasis on qualitative and transparent information, constructiveness in pursuit of shared interests, trust. Articulating or visualising innovations, in genesis, development and implementation, as well as expected results, will help to understand (Owen et al., 2013; Van de Poel, Sand, 2018).

Socially responsible companies must continuously monitor the information received from the external business environment and use it for innovation purposes. New data on innovation could encourage innovators to look for further improvement solutions. Companies can use this information as feedback and an opportunity for corrective action – for example, whether innovation is responsible and if not, it is possible to become one. Following the introduction of market innovation, follow-up of stakeholder reactions is required as well as the need to track the ongoing change in their needs. The ethical aspects of innovation must also be communicated for innovations that would have the negative effect of being withdrawn or not made available to the market.

Companies can benefit from collaborating with other companies or stakeholders, in the context of open innovation, to ensure continuous access to information flows, to track changes in the innovation system, and to provide them with answers. In some cases, it may be necessary to redefine the business model to be successful in responding to changes in the external environment. When developing innovations with different stakeholder groups, it is essential to have clarity about their roles and responsibilities. Stakeholders can interact with each other if they are flexible and able to reformulate the positions they have during the innovation process. Successful innovations have been developed in conjunction with stakeholders who wish to build on the innovation process and are open to learning when new information becomes available. Mentioned is more likely to be achieved when stakeholders can identify with a common purpose and invest in innovation by attracting resources.

Incorporating innovation into the overall CSR policy enhances the company's social legitimacy and reputation (Bachmann and Ingenhoff, 2016). CSR is a source of competitive advantage, through value creation for clients, economic values are also created.

In the pursuit of innovation, the presumption of related ethical values is essential. It requires particular attention to the role played by ethics-related components in the creation of new products and services, as well as in the origins of innovation-generating firms (Adolphson 2004; Madsen 2005). Individual and organisational values formulate the context in which technologies (products, services, processes) are understood and implemented. In this way, technology can be a way to disseminate and reinforce ethical values.

We can summarise that the implementation of innovation in the context of CSR leads to an increase in overall organisational performance by meeting specific public needs, and current general needs encourage the generation and introduction of innovation. The process is understood as two-way – innovation meets different social needs. Companies that adopt and act in the context of CSR principles are more likely to encourage the creation and introduction of innovation. As stated above, this is valid in deepening the research and refining the nature of the relationship.

Empirical study

Method: For our study, we use the Case Study method (Yin, 2006) based on four in-depth interviews with one manager of the company – VB Studio, Ltd. – during 2015-2019 and questionnaire inquiries with company employees. Author of this article conducts all abovementioned.

VB Studio Ltd.

Company history, characteristic and structure

VB Studio Ltd. (www.vbstudio-bg.com) is a company specialised in offering complete design and construction of exterior and interior solutions by integrating Architecture, Furniture, Audio / Video equipment. The company employs 22 employees. VB Studio has built and maintained a successful business in partnership with other companies.

The company works sustainably with its clients, with most of them having long-term cooperation. Members of its team have repeatedly won recognition and awards in various architectural competitions in the country and abroad.

In basic terms, the studio has two managers and consists of three departments – Architectural, Furniture and Hi-Fi. The furniture and Hi-Fi departments have one manager each.

Corporate culture, innovation, CSR and organisational performance

Corporate Culture

Although that the VB Studio Ltd is a small company, we are talking about corporate culture. It is the result of leadership perception of good management practices in the corporate culture inherent in big companies (Dimitrova, 2015).

Managers of VB Studio Ltd are defined as the bearers of the values and knowledge of the company. At this stage, they make decisions, and they are the core of the company. Their goal is to train employees seeking for innovations, as well as to use innovative ways for their development. They see motivation as the basis for success. They emphasise trust – both with customers, partners and within the company. The company's business-philosophy is looking for practical solutions.

Innovations

The idea of VB Studio Ltd is to develop a very high-competitive innovative concept. They always looking for opportunities to implement new technology solutions that reduce costs and optimise processes. They are aimed at striving to fill the lack of clients through competent employees and quality services. They believe that the primary value they create for their clients is flexibility, ability to comply and to do their utmost in line with innovative methods.

VB Studio confirms that they are oriented towards open innovation and understand it as a constant process. They consider every contact, all kinds of professional relationships as an opportunity. According to them, this generates more confidence.

Managers of the VB Studio Ltd determine the company as becoming innovative and it is defined as a company that realises the views of its clients. VB Studio says that they are also looking for opportunities to introduce technological solutions that will reduce the cost.

The idea of the company's managers is to develop a competitive approach to help them to achieve a certain degree of sustainable competitive advantage. They focus on marketing because it is not typical in their area, and fewer companies use it successfully. The company works with a large number of customers and believes that such a business model would be appropriate.

The communication between employees of VB Studio and clients is continuous, with a high degree of audibility and striving to offer a maximum range of services.

The new products introduced by VB Studio are the sought-after complexity of closing the cycle – from investment to execution and subsequent maintenance, and on the other – construction as a new component in the services they offer.

The process of recruiting and hiring employees for motivation and full involvement in the corporate culture is considered as an investment in the future realisation of innovations. They then seek out and hire individuals with whom they can build, to have long-term

relationships. Understand the motivation in pursuit and pursuit of common goals and in the competitive attitude to pursue market leadership.

VB Studio is a change-oriented company. The VB Studio manager shares the opinion that company employees can create a product that can be more or less innovative, as well as more or less out of the market niche they are. VB Studio is considered to be a company that operates in the field of the realisation of ideas of its clients. If they succeed in delivering an innovation that meets the severe need of the customers, then they will be allowed to realise a perfect product, which will initiate a major transformation of the company.

CSR

VB Studio Ltd. develops practices in line with the concept of Corporate Social Responsibility. The members of the company work on joint projects with the Union of Architects in Bulgaria (NGO). They are co-organisers of the conference "Energy Efficiency and Architectural Environment", the purpose of which is to encourage and intensify dialogue between the various parties involved in the field, as well as to include consumers in the processes. VB Studio is housed in a building that is a cultural monument and employees take care of its maintenance and preservation. Last but not least, the company supports the Protected Homes Together project. It aims to provide adequate support for children deprived of parental care and raised in state homes, as well as providing housing and qualification for young people who have left after the age of 18, these state institutions.

After presenting the case study on the example of VB Studio Ltd., we can state that the company is oriented towards introducing and applying a culture of innovation with an emphasis on leadership, confidence, the attitude to generate and submit changes in the context of sustainability.

Challenges to VB Studio Ltd

Competition in the business field in which the company operates is severe and to increase its competitiveness requires a combination of professionalism, high level of expertise, innovation, strategic thinking, economic culture, socially responsible behaviour. Competition monitoring and analysis are critical factors in maintaining and enhancing the expertise of members of the organisation.

VB Studio is a socially responsible company – it shows concern for critical stakeholders, monitors. It strives to meet their needs, works with them sustainably and maintains a high level of trust. We emphasise once again that CSR is a source of value creation, and by creating value for customers, economic benefits are designed for the company.

The case study on the example of VB Studio clearly outlines the existing link between the company's socially responsible actions and the attitudes towards innovations that will lead to increased competitive performance.

Taking and acting in the context of the innovation culture of VB Studio is essential because it is at the heart of the sustainable competitiveness of each company, understanding its vital importance and making efforts for its competent management.

Conclusion

Innovation has become imperative for any company that wants not only to survive but also to maintain and increase its competitive advantages in a highly unprofitable environment. A necessary condition for this is the implementation of responsible innovation, which contributes to improving the welfare of society. In responsible innovation, we find the two-way connection between the concept of CSR and innovation, which represents the balance between the interests of the company and stakeholders by generating shared value. The example with VB Studio is proof that when the members of the company implement innovative socially responsible practices, then they can overcome crises and changes and generate sustainability of competitive performance.

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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MACEDONIAN NATIONAL INNOVATION SYSTEM – STATES, CHALLENGES AND PERSPECTIVES

The key segments of Macedonian National Innovation System: business sector, research sector, technology transfer system and in its institutional policy framework are analysed in the paper. The results of the performed analyses point the numerous weaknesses in its key segments, particularly detected in the domain of financial and human resources, intellectual property rights, implementation of the key strategic documents and efficiency of the institutions. This paper results in a series of recommendations for innovation policy intervention that can be considered for the National Innovation System improvement.
JEL: O38; O32; O52

Introduction

Traditional economic theory has argued that in the long run, companies strive to maintain a stability, primarily by achieving optimal size and profits optimisation. Practice shows that companies that do better today are more likely to do better tomorrow, i.e. to achieve higher sales, higher profits and productivity growth. Probably the different success of the business is mainly related to their different capacities and capabilities for acquiring, creating and implementing knowledge, i.e. for developing and introducing innovations.

If we consider that the innovation drives changes, creates new opportunities, new products and services, and creates new markets, it becomes clear that today the challenge for any enterprise is to compete by introducing innovation.

In recent decades, the issues related to research and development, creation and transfer of knowledge and introduction of innovations have become an area of special interest where numerous studies and empirical analyses have been conducted. Additionally, many literature findings explicitly state that innovations are not only important for individual enterprises, but for economies as a whole, as they enable the building of competitive knowledge-based economies, which accelerates the economic growth and improves

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competitiveness of national economies to the global market. Hence it becomes clear that one of the key priorities for every market economy, that wants to boost its economic growth, should be strengthening the competitiveness of the business sector – through knowledge and innovation.

Within the paper, a particular meaning is given to the concept of National Innovation Systems (NIS). This concept is generally accepted as one of the most comprehensive systemic approaches that give insight into the innovative and economic performance of a country. In recent years, the concept of NIS, become a tool for analysing country profiles in terms of innovation, as well as a guide for policy formulation.

1. Literature review

The concept of "National Innovation System", developed in the 1980s, is closely related to the British economist Chris Freeman, the Swedish scientist Bengt Ake Lundvall and the American economist Richard Nelson.

According to the theoretical basis of the concept, economic growth, as well as competitiveness and innovativeness of the countries are largely determined by the quality of usage of available research and development resources (Cvetanović i dr., 2017).

By applying a holistic view of innovation, rather than focusing on individual aspects of the innovation process, the concept of national innovation system emphasises the importance of interaction between participants in the innovation process and considers the ways in which those processes are shaped by the influence of numerous social, institutional and political factors (Fagerberg and Verspagen, 2009).

Freeman defines the national innovation system as "… the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies" (Freeman, 1987).

Lundvall, similar to Freeman, emphasises the importance of interaction and collaboration in the processes of production, diffusion and use of new and economically useful knowledge (Lundvall, 1992).

According to Nelson, national innovation systems are "... a set of institutions whose interactions determine the innovative performance ... of national firms" (Nelson, 1993).

Unlike Freeman and Lundwall, whose theories for the concept of national innovation system are focused to the role of technology, in Nelson's theories, the focus is put on research and development activities that take place within individual national innovation systems (Nelson, 1993).

In general, according to the authors' opinion, the concept of NIS and its effectiveness is the result of the quality of the integrative process of research organisations, universities, and companies applying new technologies and knowledge in the production process (Freeman, 1987; Lundvall, 1992; Nelson, 1993).

Furthermore, in the opinion of a group of authors led by Freeman and Malerba, each country has a national innovation system, but some of them are efficient and others are not so efficient, which is largely determined by the degree of their development (Freeman, 1987; Malerba, 2000).

According to another group of authors, the definition of a national innovation system implies the existence of quality institutions. Only if the institutions part of the NIS are developed in a satisfactory extent, it makes sense to discuss the existence of the innovation system (Smith, 1997).

Therefore, it could be concluded that the performance and functionality of the individual national innovation systems are largely determined by the degree of their development and the quality of institutions.

According to the Low on innovation activity of the Republic of North Macedonia, NIS is defined as a set of organisations, institutions and the relations between them in the function of generating, disseminating and applying the results of scientific research and technological improvements in the country[2].

Innovation systems theory defines "systems" in terms of a number of "actors" and stresses that the relationships between them and system performance is often determined by the weakest link in the chain. This means that policy interventions should focus on the weaknesses. Systems theory also suggests that individual policy instruments applied in isolation are unlikely to have a high impact on overall system performance. The policy implication is that there is a need for abroad range of policy instruments, rather than a focus on only one aspect (Polenakovik and Pinto, 2010).

At the same time, many authors highlight the importance of the National innovation systems for gaining insight into the economic and innovative performances of the countries, because the NIS are one of the most comprehensive systemic approaches (Freeman 1995; Porter 1990; Patel, 1995). This insight is essential for policy-makers to develop a legal framework for enhancing the innovation performance, which is the main pillar of the knowledge-based economies (Polenakovik et al., 2014).

Within the national innovation systems, there are interacting groups of actors defined in terms of the public and private sectors and their roles as 'knowledge creators' or 'knowledge users' (Guy and Nauwelaers, 2003).

Each sector is also characterised by a dominant issues, such as:

- Social and Human Capital (The supply of and demand for qualified human resources).
- Research Capacity (The knowledge base).
- Technology and Innovation Performance (The ability to innovate).
- Absorptive Capacity (The capacity of markets to absorb and diffuse innovations).

[2] "Official Gazette of the Republic of Macedonia" No. 79/2013, 137/2013, 41/2014, 44/2015 and 6/2016.

The concept of NIS is, thus, a tool for analysing country specificities in the innovation process in a globalised economy, as well as a guide for policy formulation. It highlights interactions and interfaces between various actors and the workings of the system as a whole, rather than the performance of its individual components (OECD, 1999).

Having in mind those facts the concept of national innovation system nowadays is a kind of template for enhancing cooperation between science and industry and a model on which the development policies of European Union countries are based.

2. Methodology

For the purposes of the study, a combination of several data collection methods was used. In order to review the current status of the Macedonian NIS, its key segments (business sector, research sector, technology transfer system and institutional policy framework) and the relations between them, extensive desk review and research were conducted. The analysis is predominantly based on secondary data, i.e. data already published by the institutions responsible for the creation and implementation of the innovation policies. These documents cover: Prepared and adopted national and regional strategies (National Innovation strategy for 2012 – 2020, Strategy for Regional Development of the Republic of Macedonia 2009 – 2019, Entrepreneurial Learning Strategy 2014 – 2020, Regional Innovation Strategies for eight Planning Regions for the period 2016 – 2018, Competitiveness Strategy 2016 – 2020 and others); Laws (Law on Innovation Activity, Law on Higher Education, etc.); Development programs and action plans; National reports as well as reports from other relevant organisations on the progress of policy implementation and measures in the area of innovation and competitiveness; Reports from international organisations – the Global Economic Forum, European Commission, etc. and statistical data from the State Statistical Office and Eurostat.

Additionally, over 10 representatives (entrepreneurs and managers) of the Macedonian business sector were interviewed in order to take into consideration the key challenges connected with their innovation and R&D activities.

Research in the paper is based on new and relevant literature in the field of innovation and entrepreneurship.

Analysed quantitative indicators are further supported by qualitative analysis and by summarised results part of my doctoral thesis titled “Creating policies for promoting the innovation capability of the Macedonian business sector”.

3. Macedonian national innovation system – current states

In this part of the paper Macedonian national innovation system is analysed through its four integral segments: business sector, research sector, technology transfer system and institutional policy framework.

3.1. Business sector

Within the business sector of North Macedonia, today operate 75 914 active business entities (Table 1).

Table 1

Number of active business entities in North Macedonia, according to the number of employees

Year	Total	0[1)]	1-9	10-19	20-49	50-249	250 +
1990	**7 234**	/	/	/	/	/	/
1999	**109 378**	/	/	/	/	/	/
2010	**75 497**	**10 756**	**59 276**	**2 483**	**1 568**	**1 211**	**203**
2015	**70 139**	**7 329**	**56 261**	**3 032**	**1 947**	**1 339**	**231**
2018	**72 315**	**8 221**	**57 184**	**3 142**	**2 129**	**1 399**	**240**
2019	**75 914**	**7 565**	**61 265**	**3 211**	**2 237**	**1 404**	**232**

Source: SSO, 1999, 2020.

1) Including business entities with an unascertained number of persons employed

Micro-enterprises, small and medium-sized enterprises create almost 99.7 % of the total business population in the country, while the smallest share in the Macedonian business community, of only 0.3 %, has large enterprises with over 250 employees (SSO, 2020).

In terms of value-added and employment, SMEs in North Macedonia play a large role in the nonfinancial business economy[3]. In, 2017, SMEs generated roughly three out of every four jobs (74.2 %) and nearly two-thirds (63.4 %) of total value added in North Macedonia, which is considerably above the respective EU averages of 66.5 % and 56.3 % (European Commission, 2019). From the other side, SMEs in North Macedonia have low productivity. Annual SME productivity in North Macedonia, measured as value-added per person employed, is only EUR 9 360, in stark contrast to the almost five times greater average of EUR 43 604 achieved by EU SMEs (European Commission, 2019).

In terms of sectoral distribution, the largest share in the structure is given to the sectors Wholesale and retail trade; repair of motor vehicles and motorcycles and Manufacturing. These two sectors, in 2019, account for 30.5 % and 11.0 % of the overall economic structure, respectively (SSO, 2020). Sectors from the trade and sectors from the industry have the highest impact on the country's GDP creation. Enterprises from these two sectors in 2018 accounted for 19.6 % and 18.5 % of the GDP, respectively (SSO, 2019a). Manufacturing accounts for 19 % of the total employment in the country and at the same time, it is a sector dominated by medium-sized and large enterprises – over 30 % of the medium-sized and large enterprises operate in this sector.

The average number of active business entities per 1 000 population in North Macedonia in 2108 was 35, which is a relatively solid number, although still not a high enough average,

[3] The data cover the 'non-financial business economy', which includes industry, construction, trade, and services (NACE Rev. 2 sections B to J, L, M and N), but not enterprises in agriculture, forestry and fisheries and the largely non-market service sectors such as education and health.

having in mind that some studies in the USA and Great Britain suggest that for a well-functioning of a market economy there should be around 50–60 SMEs per 1 000 population (Brada and Fiti, 2006).

According to official statistics, in North Macedonia, the share of innovative enterprises in total enterprises in the period 2012 – 2014 is 36.0 %, and in the period 2014 – 2016 the share is 37.4 % (DZS, 2016, 2018). According to this indicator North Macedonia, in 2016, lags behind almost all countries in the region: Slovenia (39.8 %), Croatia (48.0 %), Serbia (40.5 %) etc., except Bulgaria (27.2 %). These differences are even more pronounced and are higher than 10 percentage points if the share of innovative Macedonian firms is compared to the EU-28 average which in the period 2014 – 2016 is 50.6 % (Eurostat, 2019).

3.2. Research sector

The key research institutions in North Macedonia are the Macedonian Academy of Sciences and Arts (MANU), higher education institutions (universities – faculties and research institutes), R&D departments within the enterprises and other research institutes that are not part of the universities.

Macedonian Academy of Sciences and Arts, established in 1967, in principle, is the primary national institution to promote the development of science, research, innovation and new technologies, both in the country and internationally. The scientific activity of the Academy takes place in six departments[4] and eight research centres[5].

On the other hand, despite its wide mandate, MANU has a relatively limited research capacity (Josimovski, 2011). This situation arises from the fact that the Academy is not institutionally organised. On the contrary, MANU has a relatively small number of research centres with a limited number of researchers, managed by academicians. Today, MANU has 32 academics, 6 correspondent members and 34 full-time scholars (including 17 scholars with scientific titles and 17 scholars with research titles), involved in the scientific activities of the Academy, as well as, a large number of external collaborators (university professors, junior researchers, volunteers etc.), usually engaged in the realisation of international projects.

State contribution to the budget of the Academy is about 65 % – 67 %, while the other part of the budget is consist of funds from self-financing activities, international projects, grants and donations. Although in the past few years the situation in terms of strengthening the research capacity of the Academy and increasing of the share of public budget allocations

[4] Department of Linguistics and Literary Science, Department of Social Science, Department of Medical Science, Department of Technical Science, Department of Natural, Mathematical and Biotechnological Science and Department of Arts.

[5] Research Center for Energy and Sustainable Development, Research Center for Genetic Engineering and Biotechnology „Georgi D. Efremov“, Research Center for Areal Linguistics “Božidar Vidoeski”, Research Center for Computer Science and Information Technologies, Lexicographical Center, Research Center for Cultural Heritage, Research Center for Environment and Materials and Center for Strategic Research “Ksente Bogoev”.

for research activities has been improved, lack of funding, relatively outdated equipment, unattractive salaries of researchers and low mobility of the employees, are still the key limiting factors of the research activity of MANU.

In the period 2016 – 2019, members of the Academy, have published 740 papers in total, out of which 338 in international journals (237 of them are published in journals with impact factor) and 402 in national journals and proceedings (16 of them are published in journals with impact factor).

Besides MANU, research activities in Macedonian NIS are carried out within the higher education institutions. The higher education system in North Macedonia consists of six state universities[6], 10 private universities[7] and one public-private non-profit higher education institution[8]. In the segment of the private higher education system, in addition to the universities, there are also several private faculties, institutes and colleges (MoES, 2017).

Universities in North Macedonia are mainly focused on education. However, there is evidence for engagement of universities in research activities, predominantly represented by state universities, which show a tendency for higher R&D capacity than private ones.

State University Ss. Cyril and Methodius (UKIM), with its 23 faculties and 60 laboratories, half of which are dedicated to biotechnology research, is a leader in the scientific and research activity within the higher education system in the country.

Other higher education institutions, public and private, are primarily focused on education. Consulting and training services are another important part of their activities, while basic and applied research is less performed. The insufficient coordination between the faculties, redundant equipment and facilities, unattractive salaries and limited employment opportunities for academic staff, etc., are ongoing problems of the higher education institutions in the country.

Recent research of MANU related to higher education and science in North Macedonia points to serious problems in this field. The basic problems stressed in the study are (Kambovski, 2016; MANU, 2017): the absence of a consistent and scientifically-based vision, ie strategy for development of higher education and science; the breakdown of the three core activities that define the contemporary vision of a “third-generation university” – education, research and innovation; weak effects of the Bologna Process, especially in the area of improving the quality of the education and research activity of the universities; hypertrophied university network – 24 universities with over 130 faculties and 600 study

[6] Ss. Cyril and Methodius University of Skopje, St. Clement of Ohrid University of Bitola, Goce Delčev University of Štip, University of Tetova, University of Information Science and Technology "St. Paul The Apostle" in Ohrid and “Mother Teresa” University in Skopje.

[7] First Private European University “Republic of Macedonia“- Скопје, FON University - Skopje, New York University Skopje, University American College Skopje, MIT University Skopje, University of Audiovisual Arts ESRA Paris-Skopje - New York, University of Tourism and Management Skopje, International University of Struga, International Balkan University Skopje and International Vision University - Gostivar.

[8] South East European University in Tetovo.

programs and the establishment of numerous dispersed centres; commercialisation of higher education; marginalisation of scientific and research activity in public universities; the evident discrepancy of higher education with the needs of the labour market; low investments in education and particularly in research and development; absence of a well-designed financing system of higher education, etc.

This situation determines the existence of a serious gap between the knowledge and skills provided by the education system and the demands of the labour market. That results with very low efficiency of the higher education system in the Western Balkan countries, as well as in North Macedonia. "... Efficiency is only 13 %, which means that out of 100 graduates only 13 without special problems can find employment appropriate to their qualifications, and get engaged in the labour market" (MANU, 2017, p. 64).

3.3. Technology transfer system

The technology transfer system comprises the research sector, business sector and institutional infrastructure, which supports and enables technology and knowledge transfer from research institutions to industry.

As is the case with most of the Western Balkan countries, in North Macedonia also "cooperation between public research institutions and industry is mainly conducted on an ad hoc basis, driven by occasional opportunities and short-term goals" (World Bank, 2013, p. 11). This is actually the main reason why improving of the technology transfer process, until now, remains one of the key challenges of the country.

In North Macedonia, from the early transition years has been started the process of establishing institutions to support SMEs, entrepreneurship and technology, knowledge and know-how transfer.

In the mid-1990s, in the country were established five Regional Enterprises Support Centers, three Enterprise Support Agencies (ESAs), one Regional Agency for Economic Development-PREDA (Today Foundation for Sustainable Economic Development – PREDA Plus) and eight business incubators.

Within the technology transfer infrastructure, several technology transfer centres have been established in the country, located at universities or individual faculties. Financially supported by TEMPUS and GTZ programmes the technology transfer centres/offices were established at Faculty of Mechanical Engineering – Skopje, Faculty of Electrical Engineering and Information Technology (FEIT) – Skopje, Faculty of Technology and Metallurgy – Skopje, Faculty of Agriculture – Skopje and Faculty of Technical Studies – Bitola. In addition to these, the centre of excellence – CIRKO-MES CE and Business Start-up Center (BSC) were founded in 2005 and 2006 respectively. Both centres are still active and are established at the Faculty of Mechanical Engineering – Skopje.

Another important segment of the technology transfer system of North Macedonia is the Center for Entrepreneurship and Executive Development (CEED), established in 2007, as part of the international network of entrepreneurship centres operating in Southeast Europe. Significant specificity of the Center is the CEED Business Angels Club (CEED BA Club),

founded in November 2013, as one of the first clubs of its kind in Macedonia (http://ceed-macedonia.org/).

The establishment of the Technological Industrial Development Zones (TIDZ) is an important step of the country towards improving the conditions for technology and knowledge transfer and further increasing of the innovation capacity of the economy. With the establishment of the first Technological Industrial Development Zone (TIDZ 1), located near Skopje Airport (Bunardzik), there were attracted the two leading Greenfield investors – Johnson Controls and Johnson Matthey, as well as, Van Hall, Aptive, Kemet, Protek Group and others. FDI "opened new jobs and brought sophisticated technology in the country" (Богдановска, 2017). Limited cooperation of domestic enterprises with FDI is a serious challenge and should be significantly improved.

Furthermore, one of the key institutions within the technology transfer system of the country is the Fund for Innovation and Technology Development (FITD), established as a public institution in 2013, with financial support and technical assistance by the World Bank. Acting through its key support instruments[9], FITD by the beginning of 2020, has provided support to 314 micro, small and medium-sized enterprises, with a total value of the projects of € 57 million, and has supported 54 schools with more than 500 students directly involved, as well as more than 30 partner organisations. Successful piloting of the instruments for supporting technology extension and business-technology accelerators programmed in the ERP 2018-2020, part of the measures of the third pillar of the Economic Growth Plan, resulted with establishing of three business accelerators: Business Accelerator "UKIM", "SEAVUS" Accelerator and "X Factor" Accelerator (see more at: http://www.fitr.mk/).

The "UKIM" Accelerator is an integral component of the new National Technological Transfer Office and it is located at the Faculty of Electrical Engineering and Information Technologies (FEEIT) in Skopje, within the Center for Technology Transfer and Innovation (INOFEIT). INNOFEIT is a place where the faculty staff, students and company representatives can interact, network and transfer technologies and innovations. "UKIM" Accelerator is already active, and several start-up businesses have started operating within it and INOFEIT from the previous period has experience in supporting collaboration with the industry.

3.4. Institutional policy framework

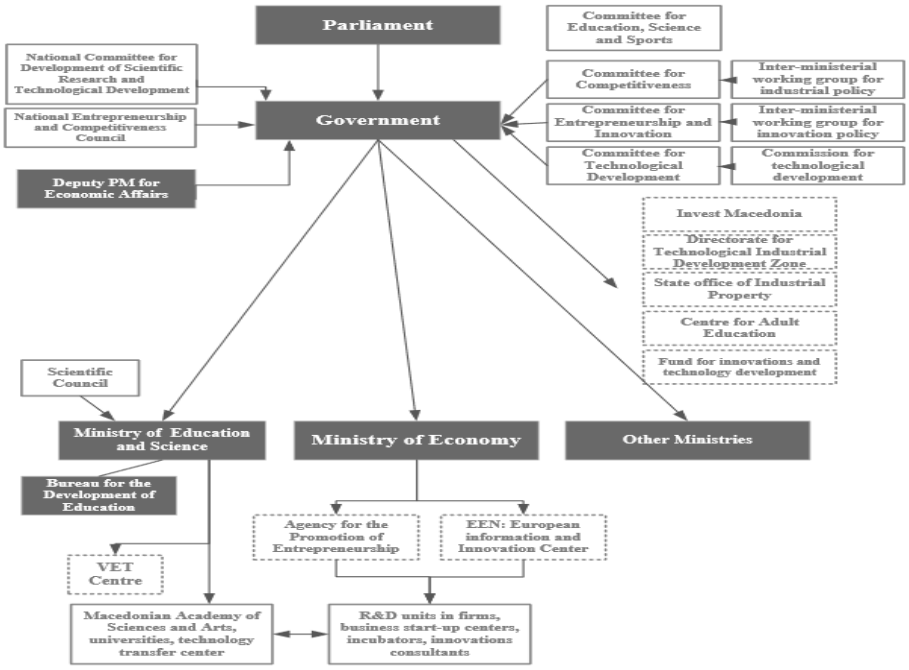
The institutional policy framework in the National innovation system of North Macedonia is relatively complex and, besides the government with its ministries, as the highest executive body responsible for innovation and R&D policy-making, includes a large

[9] Co-financed Grants for Newly Established Enterprises: Start-up and Spin-off; Co-financed Grants and Conditional Loans for Commercialization of Innovations; Co-financed Grants for Technology Extension and Co-financed Grants for the Establishment, Operations and Investments of Business and Technological Accelerators.

number of agencies, committees, boards and other bodies and institutions in charge of their implementation, shown in Figure 1.

Figure 1

Governance structure of the national innovation system



Source: National Study, 2017

Within Macedonia NIS there are two key institutions responsible for policy-making in the area of innovation and competitiveness: Ministry of Education and Science and Ministry of Economy. Cabinet of the Deputy Prime Minister for Economic Affairs, Macedonian Academy of Sciences and Arts and National Entrepreneurship and Competitiveness Council are also one of the key policy-makers in this area.

The key institutions for the implementation of innovation and R&D policies in North Macedonia are: Agency for Promotion of Entrepreneurship, Fund for Innovation and Technology Development, State Office for Industrial Property, Agency for Foreign Investment and Export Promotion, Directorate for Technological Industrial Development Zones etc.

At the regional level, there are eight Regional Agencies (five SME Development Funds and three Enterprise Support Agencies) covering 7 of the 8 planning regions. These Regional Agencies are providing expert and technical assistance designed to strengthen the capacity of SMEs.

Through UNDP project in 2014 within the Centers for Development Support of Planning Regions were established Business Support Centers. The main aim of these centres is to provide consulting services for SMEs.

4. Key strategic documents within Macedonian NIS

In North Macedonia in the past period and especially in the period after 2008, has been started the process of intensive reforms, mainly aimed to improve the business climate for increasing the innovation capacity of the business sector, strengthening the role of SMEs in the economy, attracting FDI, fostering R&D in the country and boosting private sector competitiveness. Within this process, there have been made significant improvements in legislation and numerous documents (strategies, laws and legal solutions, action plans, programs and measures) have been adopted at the same time.

In the area of innovation was made legal framework that enabled the establishment of the Fund for innovation and technology development, as a central institution in the national innovation system in terms of business innovation support.

At the same time, the Law on promoting technological development (2008) and the Law on Innovation Activity (2013) were adopted, and there were made amendments to the Law on Research Activity and the Law on Higher Education.

In the last period were adopted numerous strategic documents, such as: National Innovation strategy for 2012 – 2020, Strategy for Regional Development 2009 – 2019, Entrepreneurial Learning Strategy 2014 – 2020, Regional Innovation Strategies for eight Planning Regions for the period 2016 – 2018, Competitiveness Strategy 2016 – 2020, Industrial Strategy 2018 – 2027, National Small and Medium-sized Enterprises Strategy 2018 – 2023 etc.

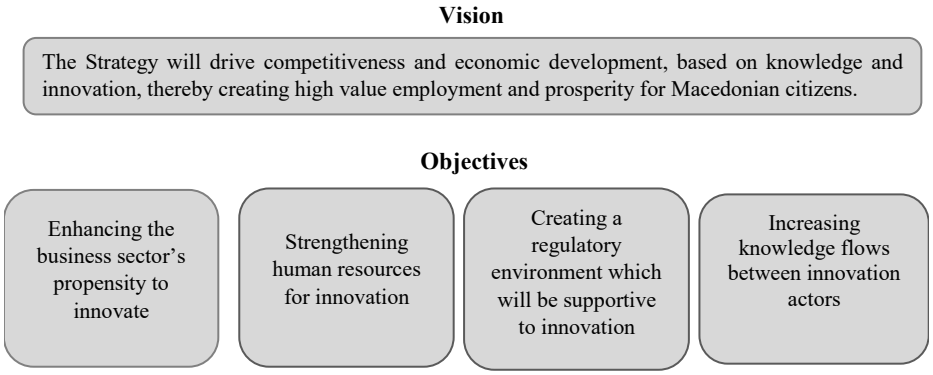
4.1. National Innovation Strategy (2012 – 2020)

One of the key strategic documents within the Macedonian national innovation system is the National innovation strategy (2012 – 2020) adopted in 2012. The document articulates a vision and four strategic objectives (Figure 2), with the intention, that by 2020, North Macedonia should have an effective national innovation system, created by all stakeholders, and open to the world.

The key actor in the implementation of the strategy is the Ministry of Education and Science (MES). Until now, MES, has developed three Action plans (Action plan 2013 – 2015, Action plan 2016 – 20158 and Action plan 2018 – 2020).

Figure 2

National Innovation Strategy (2012 – 2020): vision and strategic objectives



Source: National Innovation Strategy 2012 – 2020

Last Action plan 2018-2020, developed with the support of the World Bank Skills Development and Innovation Support Project Office, contains numerous measures related to creating an innovation support infrastructure, trainings, grants, awareness-raising, new models of support etc.

Key outputs of the implementation of measures related to this strategy, in terms of innovation support infrastructure development, are founding of the Fund for Innovations and Technology Development, as an active implementer of the innovation policy in the country and the (new) National Technological Transfer Office.

5. Innovation policy in North Macedonia – overview of the Plan for Economic Growth

Innovation policy in Macedonia consists of three main segments:

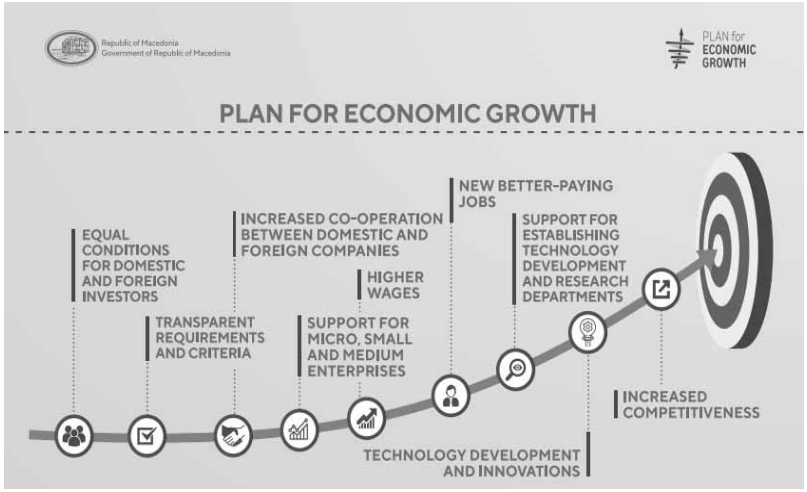
- Policies for attracting FDI in the Technological Industrial Development Zones (TIDZs), started in the period after 2006;
- Fund for Innovation and Technology Development (FITD), founded in December 2013 as a state institution, with the financial assistance from the World Bank; and
- Plan for Economic Growth, launched in 2018.

The Plan for Economic Growth from 2018, as the latest segment of the national innovation policy, designed by the government to provide a complete and integrated system to support innovation in the business sector, is briefly elaborated below.

The basic objectives of the Plan are shown in Figure 3.

Figure 3

Plan for Economic Growth, 2018



Source: Government of Republic of North Macedonia, 2018

The Plan for Economic Growth contains three pillars:

The first pillar includes support for: creation of new jobs, capital investments and revenue growth, establishment of technological development and research departments, cooperation with suppliers, purchasing assets from enterprises with difficulties and stimulation of investment projects of significant economic interest to RNM;

The second pillar includes support for: improving the competitiveness of companies in new markets and conquering new markets and increasing the sales of the companies in new markets; and

The third pillar includes support for: gazelles, micro and small domestic enterprises, as well as start-ups, innovation, professional training and practice of newly employed young people and the creation of conditions and the preparation of legal basis for the development of venture capital in the country.

The strengths of the Plan for Economic Growth are reflected in the fact that the Plan is an attempt to integrate all significant segments of the innovation policy that have been applied in the country after 2006 – foreign direct investment, innovation support through the new institution (FITD), activities related to establishing links between foreign companies and domestic firms, encouraging the process of establishing research sectors in companies, supporting the entrepreneurship and the fast-growing SMEs, focusing on the measures intended to improve the innovation performance of the Macedonian business sector, etc.

Generally, there are several issues (weaknesses) of the Plan for Economic Growth:

- the complexity of the procedures for determining the business entities that will have access to the funds provided for in this plan, both in the pre-selection and in the final selection phase of the companies, and in the period following the implementation of the support;
- the funds under the first and second pillar of the Plan for Economic Growth are granted ex-post, in the form of subsidies to already implemented activities, while the funds provided for under the third pillar of the Plan, which are under the competence of FITD, are awarded in the form of grants before the implementation of the investment begins;
- the available assets (budget) to support the companies are modest – just over EUR 50 million annually (for 2018) for economic development and around EUR 16 million for the implementation of active policies on the labour market;
- this type of innovation policy belongs to the group of horizontal innovation (industrial) policies, which means that its measures apply to all business entities in the economy.[10] Since the structure of the Macedonian economy is dominated by the traditional sectors, it is expected that a significant part of the funds for support will end up in business entities from these sectors. It brings the danger of reproducing the unfavourable structure of the Macedonian economy;
- the absence of a solution for monitoring the effects of the implementation of the support measures offered by the Plan for Economic Growth, which will enable assessment of the economic effects of the measures – increasing the innovativeness, productivity and competitiveness of the Macedonian business sector.

6. Main challenges of the Macedonian national innovation system

Key challenges facing the Macedonian national innovation system are identified in the following areas: financial resources, human capital, Intellectual Property rights, implementation of the key strategic documents and efficiency of the institutions.

6.1. Financial resources

This part of the analysis gives an overview related to R&D activities in the country, based on the relevant indicators, such as: R&D expenditure as a percentage of GDP (also known as a R&D intensity) and structure of the R&D expenditure by sectors (source of funds). Analysed data has been compared with the trends in selected neighbouring countries and with the EU average.

[10] The plan defines that the support measures do not apply to public enterprises, enterprises with licensed businesses, law firms, audit firms, accounting bureaus, enterprises – users of agricultural subsidy, enterprises – users of concession and banks, insurance companies and funds, which is basically understandable.

In the analysed years (in period 2007-2018) in North Macedonia the percentage of GDP devoted to the R&D has been increased from 0,17 % of GDP in 2007 to 0,44 % of GDP in 2015 and 0,37% of GDP in 2018. Although in the analysed period this percentage is mostly increasing, it is still very low compared with the countries from the region such as Bulgaria 0,75 %, Croatia 0,97 %, Serbia 0,92 % etc., and especially compared with the EU-28 average (2,12 %), shown in Table 2.

Table 2

Gross domestic expenditure on R&D (% of GDP), for selected countries

	2007	2008	2009	2010	2015	2016	2017	2018
EU-28	1,77	1,83	1,93	1,92	2,04	2,04	2,06	2,12
Bulgaria	0,43	0,45	0,49	0,56	0,96	0,78	0,75	0,75
Croatia	0,79	0,88	0,84	0,74	0,84	0,86	0,86	0,97
Romania	0,51	0,55	0,44	0,46	0,49	0,48	0,5	0,51
Slovenia	1,42	1,63	1,82	2,06	2,2	2,01	1,86	1,95
Serbia	:	:	0,82	0,70	0,81	0,84	0,87	0,92
North Macedonia	0,17	0,23	0,20	0,22	0,44	0,44	0,35	0,37
Montenegro	:	:	:	:	0,37	0,32	0,35	0,36

Source: Eurostat, 2019.

Besides the low level of investments in R&D, of greater concern is the structure of R&D expenditure by sectors and especially the low level of investment in R&D by the business sector. The R&D expenditures are primarily in high education (58.01%) and 30.57% are coming from the business sector. In all others mentioned countries, except Montenegro (14.47%) the business sector invests significantly more in R&D (Table 3).

Table 3

Structure of expenditure on R&D by sectors for selected countries, in 2018

	Business sector	Government Sector	High education	Non-profit organisations
EU-28	66,71	10,74	21,78	0,76
Bulgaria	71,91	22,06	5,45	0,58
Croatia	48,03	19,93	32,04	:
Slovenia	74,2	13,55	11,92	0,33
Serbia	39,1	28,17	32,72	0,01
Montenegro	14,47	44,29	38,98	2,26
North Macedonia	30,57	9,82	58,01	1,61

Source: Eurostat, 2019.

Another significant limiting factor of the innovativeness of the Macedonian business sector, in the area of financial resources, is the difficult access of enterprises to funds for supporting of innovation and R&D activities. Access to funds is particularly difficult for small and medium-sized enterprises, and especially for micro-enterprises and start-ups. This situation mainly stems from the restrictiveness of banks in financing innovation projects. Commercial banks in the country mainly prefer traditional loans. The absence of

developed venture capital in the country is also a limiting factor of innovation activity of the Macedonian business sector.

6.2. Human capital

In the analysis, the human capital involved in R&D is also taken in consideration. As a relevant indicators are analysed the share of researchers involved in R&D in total employment (FTE)[11], researchers in R&D (per million people) and the distribution of researchers by sectors. According to the Eurostat definition R&D researcher "is a person that can be employed in the public or the private sector – including academia, to create new knowledge, products, processes and methods, as well as to manage the projects concerned" (Eurostat, 2013).

The FTE index in North Macedonia with a value of 0.21 ranks country at the last position between analysed countries. The index is also significantly lower than the EU average (0.90). In the country, in 2017, the share of the researchers (FTE) in the business sector, is 21.5%. This indicator is significantly lower than the EU average (51.1%) and it is also much below the indicator of Slovenia (61.8%) and Bulgaria (43.4%). North Macedonia especially marks a significant lag in terms of the number of researchers in R&D per million people (Table 4).

Table 4

Share of researchers involved in R&D in total employment (FTE), researchers in R&D (per million people) and the distribution of researchers by sectors, in selected countries, in 2017

	Full-Time Equivalents (FTE)	Researchers in R&D (per million people)[1)]	Percentage of researchers – full-time equivalent in			
			Business sector	Government sector	High education	Non-profit organisations
EU-28	0.90	3 939	51,1	10,3	37,7	0,9
Bulgaria	0.49	2 130	43,4	30,7	25,3	0,6
Croatia	0.49	1 865	21,3	23,0	55,6	:
Slovenia	0.99	4 468	61,8	16,2	21,7	0,3
Serbia	0.55	2 079	10,6	20,6	68,8	0,0
North Macedonia	0.21	729	21,5	12,5	63,4	2,6

Source: Eurostat, 2019; World Bank [1)], 2019

Besides the modest research community of only 729 registered researchers in R&D per million people in 2017, in the same year in the country are identified only 49 research units, within the business entities included in the sample of R&D survey of SSO (World Bank, 2019; SSO, 2019b).

[11] FTE Index – Ratio of the number of researches and total employment (FTE).

6.3. Intellectual Property rights

One of the main indicators for the innovation activity and economic performance of the businesses are the results in the domain of intellectual property rights. The main institution in North Macedonia responsible for the Intellectual Property (IP) protection is the State Office of Industrial Property (SOIP). In recent years, the capacity of the SOIP has been significantly enhanced by intensifying the participation of the staff at international seminars, improving its technical equipment, providing access to certain international databases, etc. (SOIP, 2016). The SOIP is promoting creativity and innovation through initiatives such as the International Intellectual Property day, the Patent of the Year, local exhibition of inventions, participation in the international exhibition of ideas, inventions and new products etc.

Analysed data in the selected years shows some improvement in the domain of the intellectual property rights in the country (patent applications, trademark applications and industrial design applications), sown in Table 5. This trend is mostly in accordance with the general trend in Western *Balkan* countries.

Table 5

Intellectual Property rights, in selected years

	2005	2011	2015	2018
Total number of patent applications	436	405	719	1094
National	53	37	31	32
Foreign	383	368	688	1062
Total number of trademark applications	1050	1391	1354	1322
National	433	944	815	843
Foreign	617	537	539	474
Total number of industrial design applications	60	61	388	227
National	47	45	21	33
Foreign	13	16	367	194

Source: SOIP, 2006, 2012, 2016, 2019.

The difference in the domain of patent applications and trademark applications may be a sign that despite the limited capacity for technological innovation, companies in North Macedonia do compete to design new products and new ways to commercialise them (OECD, 2011, p. 2). Another problem in the country in the field of patents and trademarks is the dominant share of foreign applicants before the domestic applicants as well as the fact that the domestic patents are awarded to individual inventors.

Furthermore, one of the most frequently cited criticisms that are mostly coming from international institutions, concerns the process of examining patent applications by SOIP. Namely, the State Office of Industrial Property does not conduct a substantive examination of patent applications. Instead, the validity of the registrations of the invention is estimated only at the stage of investigation of possible legal violations, which creates legal uncertainty over the patent rights (OECD, 2013).

6.4. Implementation of the strategic documents

One of the key weaknesses of the national innovation system is related to the inefficiency in the implementation of the key strategic documents. Although most of the strategies adopted in the past period (National Innovation Strategy 2012-2020, Competitiveness Strategy 2016-2020, Industrial Strategy 2018-2027, National Small and Medium-sized Enterprises Strategy 2018-2023 etc.) are documents with high quality, their huge number often creates confusion among policy-makers and implementers. The confusion is heightened by the fact that there are numerous institutions in the field, often with the same or similar competencies, making their coordination process considerably difficult.

For example, in the 2018 work programmes of the institutions, part of the Macedonian NIS, are identified 28 national support measures, relevant for innovation and technology development in the private sector. The large number of – 28 measures and the different responsible stakeholders make it very difficult for the private sector to understand which support is available to them. In 2018, EUR 23.18 million had been awarded for the purpose of support to innovation and technology development and SMEs. Most of the funds (97 %) were allocated through open calls by Fund for Innovation and Technology Development. The remaining part of the funds was allocated through the Ministry of Economy and the Agency for Entrepreneurship Support (FITD, 2019).

6.5. Efficiency of the institutions

The modern economic literature, in the recent years, is increasingly pointing to the importance of institutions, their quality, their capacity and their credibility to the sustainability of economic growth (Acemoglu and Robinson, 2012; Petreski, 2004; Fiti, 2019).

According to Nobel laureate Douglass North, the existence and development of the organisations are strongly influenced by institutions and, conversely, organisations influence the development of the institutions. This further means that if there are strong and efficient institutions, there will be strong and efficient organisations (North, 2005).

Despite the great importance of the institutions for the economic performance of the countries, it is a fact that North Macedonia is a country with weak, inefficient and non-credible institutions. “Macedonia has serious problems with the quality of institutions and the quality of governance” (MANU, 2017, pp. 87-88).

Important documents that perform qualitative analysis and evaluation of institutions in the country, their efficiency, quality and credibility are the annual reports of the European Commission (EC) on the progress of the Republic of North Macedonia in the process of EU accession. Almost all annual reports of the EC state that in North Macedonia there is a weak institutional capacity for law enforcement, fight against corruption, regulation and business agreements and that the judicial system is strongly influenced by political interests (European Commission, 2018, 2019).

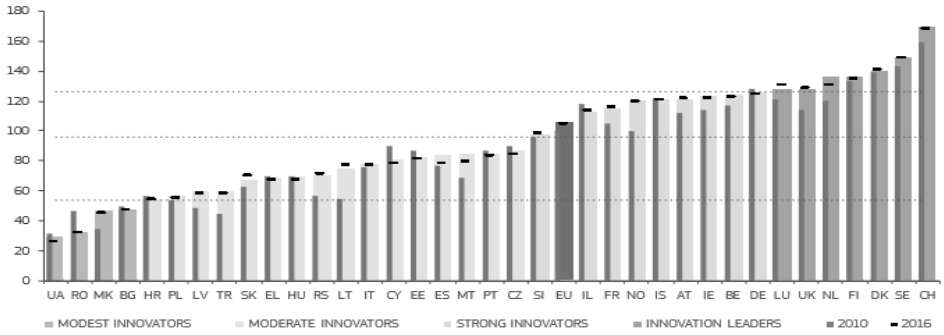
7. Assessment of the innovativeness and competitiveness of the Macedonian business sector according to international reports

Numerous challenges facing Macedonian NIS that were detected in analyses, result with modest innovativeness and low level of competitiveness of the Macedonian economy.

According to the relevant Report of EC[12] – European innovation scoreboard 2019, the North Macedonia Summary innovation index has a value of 43.4. With the innovation performance below 50% of EU average, North Macedonia falls in the group of modest innovators (Figure 4).

Figure 4

Performance of European and neighbouring countries' systems of innovation



Source: European Commission, 2019

Another relevant report that ranks countries annually in terms of competitiveness performance, is the Global Competitiveness Report of the World Economic Forum. According to the last Global Competitiveness Report from 2019, North Macedonia with Global competitiveness index of 57.3, is ranked on 82th place among 141 countries. In terms of this competitiveness indicator, North Macedonia in the analysed year has lower performance than all countries from the Region included in the research: Slovenia (70.2 / 35.), Bulgaria (64.9 / 49.), Romania (64.4 / 51.), Greece (62.6 / 59.), Serbia (60.9 / 72.), Croatia (61.9 / 63.), Montenegro (60.8 / 73.) and Albania (57.6 / 81.) (World Economic Forum, 2019).

Conclusions and recommendations

Performed analyses of the innovation system of the Republic of North Macedonia clearly points on the existence of numerous weaknesses in its key segments: business sector, research sector, technology transfer system and in its institutional policy framework. This

[12] The European innovation scoreboard provides a comparative analysis of innovation performance in EU countries, other European countries, and regional neighbours.

situation is expected, especially having in mind the fact that the weaknesses in one segment automatically spill over into the other segments of the system and limit its efficiency. The main challenges of the Macedonian NIS are detected in the domain of financial resources, human capital, intellectual property rights, in the process of implementation of the key strategic documents and efficiency of the institutions.

As a mostly important segments of the innovation system that can be denoted as typically entrepreneurial approaches, are identified the following:

Increment of the gross R&D expenditures, especially R&D expenditures of the business sector – for the achievement of this goal it is necessary: the government to treat those budget allocations as non-discretionary government spending; the dynamic of R&D expenditures growth should be higher than the GDP growth at medium term; for achieving this goal, unproductive government spending should be reduced. Increment in the usage of foreign scientific project funds (particularly the European funds) also should be achieved.

Improvement of the enterprises' access to funds for supporting of innovation activities and R&D – this measure includes: the well-capitalised, stable and liquid banking sector to facilitate the SMEs access to funds through the introduction of new banking products (credit lines) intended for supporting of innovative projects; preparation of high-quality project proposals by business sector; recapitalisation of the Development Bank of North Macedonia; increment of the available funds of FITD and affirmation of alternative sources of finance for business – venture capital funds and business angels, factoring, leasing, etc.

Harmonisation of the Macedonian formal education system according to the labour market requirements – for the achievement of this goal radical reform in the education system should be undertaken at all levels and dual education system should be implemented.

Continuing education of the employees in the business sector – the process of continuing education of the employees is of a high importance for the improvement of the innovation activities and of their productivity. Besides straightening of the management awareness for the benefits of the knowledge improvement and employee's skills, in the same time is necessary government subsidies and incentives to be established for enterprises that are investing in continuing education of their employees.

Increment of the entrepreneurial awareness for the importance and benefits of introducing of innovation – this presents a common measure of innovation policies among developed countries and it is implemented through organising seminars, round tables, media campaigns, affirmation of successful entrepreneurs, etc.

Straighten the cooperation of domestic enterprises with FDI – the low level of cooperation between domestic enterprises and FDI in the country is leading to a reduction of the positive impact of the FDI in the Macedonian economy. The support should be in the form of: tax and custom incentive for the domestic subcontracting enterprises that will be included as a part from the international value-added chain of foreign companies (in the import of machinery, technology, row materials, etc.); subsidising of the costs intended for the training of their employees for the usage of the new technologies and also some forms

of financial incentives should be established for the FDI that will start cooperation with the domestic enterprises.

Increment of the competitive pressure in the Macedonian economy – a large number of studies have confirmed that competitive pressure in the economy has a key role in the improvement of investments and innovativeness in the economy. This is a wide range measure and assumes changes in the key segments of the business climate, particularly in those with the highest importance for the competitiveness of the enterprises: protection of copyrights, including the industrial property rights, rising contracts efficiency, enhancing the efficiency of regulatory authorities, fighting against corruption with a focus on the corruption in public procurement.

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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ECONOMIC INNOVATION IN VIETNAM IN THE PERIOD AFTER 1986[5]

During the period from 1975 to 1986, Vietnam had to face a serious economic crisis. Difficulties and problems came from poverty, war consequences, unfavourable changes of the international situation and especially the outmodedness of the economic model of centralized bureaucratic planning. Therefore, Vietnam had to undertake a program of economic innovation, known as "Doi Moi" (Innovation) in 1986. Up to now, after 34 years, Economic Innovation has brought many achievements in terms of growth rate, the scale of the economy, the shifting of the economic structure toward modernization, institutional innovation and extended international integration… However, at the same time, there remain problematic issues such as quality of growth, productivity and sustainable development…., to be tackled with. In fact, this is the first economic innovation (1986-2019). These contents will be analyzed and evaluated by the article on the basis of the model of economic innovation through a process of change and continuity in the market economy thinking in Vietnam.
JEL: N00

1. Introduction

Adam Smith's theory of economic development was first propounded (1776) which stated that the process of development, once having started to gather momentum and transform into a cumulative period, can exist by itself. This theory is continuously developed by K.

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Marx and other economists to this day. K. Marx (1894) defined economic innovation through two stages: (i) technological innovation; (ii) expanded reproduction. Lenin's new economic policy (NEP) in 1921 was aimed at an integrated economic model consisting of the state economy, collective economy and private capitalist economy and emphasizing the role of the private capitalist economy. This was a prominent element in the new economic development policy implemented in Russia. This model was adopted by many socialist countries (before 1990) in their economic innovation programs. The development of the economic theory was marked by the birth of Joseph Schumpeter's innovative economics theory (1942), emphasizing the importance of institutional innovations, enterprises and technological innovation is the heart of the economy and the engine of growth.

By 1978, China had implemented an economic innovation program based on the socialist market economy model led by Deng Xiaoping (General Secretary of the Communist Party). In essence, this is an economic innovation model originated by innovating economic thought. Deng Xiaoping once said, "It doesn't matter whether it is a white cat or a black cat, as long as it can catch a mouse".[6] China implemented a mixed economic model, including the state economy, collective economy, private capitalist economy combined with mobilizing other resources in the entire society for economic development. Thus, by implementing this model, China abandoned the model of the planned and bureaucratic economy.

These theories are the basis for Vietnam to transform its thinking, to plan and carry out the economic renovation. Vietnam's economic innovation had been a gradual process with the landmark being the VI Congress of the Vietnamese Communist Party (1986). Since then, innovation policy officially became the long-term development direction of Vietnam. According to the Political Report of the Communist Party at the VI Congress mentioned above, economic innovation is defined as "the process of transforming the economy from a centralized and subsidized mechanism, based mainly on the system of mass and collective ownership to a multi-sector commodity economy, under the market mechanism with the regulation of the State, under the leadership of the Communist Party of Vietnam in the socialist orientation; step by step promoting industrialization and modernization; transforming the economy from a basically 'closed' economy to an 'open' economy in the region and the world, with a view to combine national strength with the global strength in economic development".

It must be emphasized that a market economy is a product of human civilization which is highly developed by capitalism, but the market economy by itself is not synonymous with capitalism. The socialist-oriented market economy in Vietnam is a mixed economy which

[6] In order to convince Chinese leaders, Deng Xiaoping thought that a private capitalist economy (black cat) was needed, considering it a key source of Chinese economic development, complementary to the state economic sector (white cat) which was not effective. And so far the Chinese have been very successful in economic development.

is affected by economic rules, combined with the exploitation of the elements that ensure the socialist orientation.[7]

After 34 years of economic innovation, Vietnam has changed a lot. From a backward agricultural economy, Vietnam has been able to build technical and economic infrastructure to meet the demand of the process of modernization and industrialization; the quality of life of the majority of the people is improved; politics and society are largely stable; national security is maintained; international relations are expanded and Vietnam has increased its role and reputation in the international arena.

There have been extensive literature writings on Vietnam's Innovation since 1986. The book by Vuong Dinh Hue (2016) titled "Looking back 30 years of Innovation: Prominent Achievements in Economic Development" has given an overview of the significant achievements of Vietnam's Innovation in the past 30 years; Tran Dinh Thien (2015) on "Assessment of the achievements of 30 years of Innovation and positioning of Vietnam's economy"; Report by the General Department of Statistics in 2006 also analyzes the Innovation and Development of Vietnam in 20 years; Report by the Economic Committee of the Congress (2013) on Macro-economy – challenges ahead; The article on "Socialist-oriented economy through the documents of the Party during the Innovation period" by Nguyen Thanh Tuan… These writings provide certain information and understanding about 30 years of renovation in Vietnam. However, there is a need to systematize these materials to provide a more comprehensive picture of this important period in contemporary Vietnamese economic history. Jerry Couvisanos et all (2014) argued that innovation economics is defined as a body of economic theory that contends a priori that economic development is the result of appropriated knowledge, innovation and entrepreneurship operating within an institutional environment of systems of innovation.

2. Why did Vietnam Design Economic Innovation?

There are several major reasons why Vietnam had to innovate. *Firstly, it was due to the serious economic crisis*. After the reunification of the country in 1975, the Vietnamese took lots of pride in winning the war and thought that if we could overcome the hardships of war, there should be no difficulty in building the grand socialist economy after 15 or 20 years. It was no coincidence that during this time, in Nghe An, a central province of Vietnam, there was the slogan that "we need only a sheath of rice, a packet of egg-plants and a communist heart" to build socialism in our country. However, in reality, the enthusiasm and rationalist thinking did not help create "an economic miracle" as we desired.

Until Innovation, Vietnam's economy had fallen into a serious predicament. Industrial production was stagnated. Circulation and distribution of commodities were congested due to the shortage of goods and the policy of closed-door by the government. Prices of

[7] Socialist orientation means the achievements of economic innovation must serve the interests of people of all strata, social welfare, poverty alleviation, etc. and create fairness and equality for the Vietnamese people.

commodities elevated. Inflation increased up to three digits. The life of government officials and employees and the urban population was in an extremely difficult situation. The life of rural people was even worse. Due to the implementation of the policy of planned agricultural development through the operation of a co-operative society, people develop a negative attitude of depending upon the collective. The result was that many people did not take much responsibility in work, agricultural products fell and the life of farmers became very difficult.

During the period 1976-1980, the GNP growth rate reached only 1.4%, while the population increased at 2.24%; In 1986, there was hyperinflation of 874.7% (General Department of Statistics, 2006).

Secondly, the out-modedness of the bureaucratic and centralized economic planning model. This was the Soviet Union style of economic and social development model. This model emphasized the role of economic planning, with the foundation being the state ownership. It did not acknowledge the commodity economy and market mechanisms. It did not acknowledge the multi-sector economy. It was to build a closed and inward-oriented economy. It gave priority to the development of the heavy industry. It was to implement the policy of equal distribution of goods. The widespread of the government's subsidy system generated a dependent attitude and eliminated the dynamics and activeness of the individuals. Besides, with limited financial resources, the state's subsidy policy became inefficient.

It is to be noted that, during the time of war, this centralized economic planning was effective, because it could centralize power and resources and direct everyone toward a cause, that is, to fight for the independence of the country. However, when the situation had changed, this model needed to be replaced. This was one of the urgent needs pushing Vietnam towards Innovation.

Thirdly, it was poverty, war and the consequences of war. As we may know that, the economy of Vietnam was mainly based on small manufacturing enterprises. The productive force was weak. In addition, it had to undergo years of war. Within only 4 decades (1945-1985), Vietnam had had to undergo four major wars, with France, the U.S., Cambodia and China. All wars left behind a heavy loss. Moreover, the frequency of natural disasters, especially storms (10 storms annually on average) made the poor Vietnam become poorer. At that time, Vietnam's per capita income was among the lowest in the world. Infrastructure and technologies were backwards and heavily damaged by wars. Labour was basically manual and thus, productivity was very low. Therefore, the life of the people was very difficult. In this context, Vietnam must find a way to get out of the crisis. People said that it was like to save them. In other words, this situation forced Vietnam to start Innovation.

Fourthly, it was the unfavourable changes of the international situation. It is important to note that, during the 2 wars against France and America, Vietnam had received enthusiastic support of socialist countries and many peace-loving people in the world. This showed that, Vietnam was well aware of the influence of external factors. The support of external factors contributed to the victory of Vietnam. After the country was unified (1975), large amounts of aid from allies were cut short due to various reasons. To make the situation worse, Vietnam got into 2 wars in the Southwest and the Northern borders. Investments in the

defence and security did adversely affect the social-economic development of the country. Meanwhile, the US and the West put an embargo on Vietnam, which lasted for several decades. This caused great loss to Vietnam in many ways, particularly in economic and diplomatic fields. "The Cambodia Question" made Vietnam's relations with many countries become worse. Vietnam was even isolated. In this situation, there was only one way for Vietnam to get out, that is to change its domestic and foreign policies. In other words, Vietnam must innovate. It was the only choice.

And fifthly, it was the impact of various reforms and innovations taking place abroad. Perhaps, the most direct impact came from the Soviet's programs of innovation. The socio-economic difficulties and inadequacies of Soviet socialist model were factors behind the process of innovation and reforms of the Soviet Union and socialist countries in Eastern Europe. In 1985, the 27th Congress of the Communist Party of the Soviet Union adopted a innovation policy with an impressive name, i.e., "Perestroika". However, the Soviet Union did not succeed in its reforms. As pointed out by some analysts, the Soviet Union failed because they started with "political innovation" and made lots of mistakes in policy-making and implementation measures. Yet, the reform policy of the Soviet Union had a great impact on the innovation process of Vietnam. During this time, Vietnam and the Soviet Union had a special friendship and every change in the Soviet Union had both a direct and indirect impact on Vietnam. It was quite obvious that the impact of the Soviet Union's reforms on Vietnam was greater than that of neighbouring countries such as China. During this time, Vietnam and China hardly had any interaction as a result of the border war in 1979. However, in East Asia, some "dragons" such as South Korea, Taiwan, and Singapore had made miraculous progress as a result of economic structural reforms and active foreign policy. This created a "domino" impact in the region, including Vietnam.

Interview 1: Economic Innovation in Vietnam

Vietnam is in the process of transitioning to a market economy and deeper and deeper integration into the world economy. The macroeconomic policies from 1986 up to now, in my opinion, have been on the right track, helping the economy to achieve certain results in economic growth and poverty reduction. The role of science and technology, and recently the role of innovation in economic growth have been reflected in the evolution of economic theories that govern our economic policy. Thus, it can be said that, Innovations in Vietnam was an inevitable outcome of a pro-long socio-economic process. The root cause of economic innovation in Vietnam was this social urge to make the entire society move in one direction. It was to seek a way out of a deadlock. The turning point was the policy of economic innovation, outlined in the 6th Congress of the Communist Party of Vietnam in 1986.

(Interview with Professor, Dr. Nguyen Quang Thuan, Vice Chairman of the Central Theoretical Council of Vietnam Communist Party, Former President of Vietnam Academy of Social Sciences)

As analyzed above, the combination of all these five kinds of elements forced Vietnam to innovate in order to survive. There was no other choice.

3. How has Vietnam Fostered Its Economic Innovation?

The policy of Innovation has officially been implemented since the 6th Congress of the Communist Party of Vietnam in 1986. Economic innovation guidelines have gradually been completed during the implementation process. Today, economic innovation is thus defined by the State of Vietnam as follows: the process of transition from the bureaucratic centralized planning economy to multi-sector commodity economy, operating under market mechanism, with the management and regulation of the State, in accordance with socialist orientation (Nguyen Thanh Tuan, 2016). Innovation in Vietnam has some important characteristics:

Firstly, the State is to accept the equal and legitimate existence of many economic sectors (The 9th Congress of the Communist Party of Vietnam regulated 6 economic sectors: State-owned economy, collective economy, individual economy, private capitalist economy, State capitalist economy, foreign-invested economy), many forms of ownership (public ownership, collective ownership, private ownership, mixed ownership). However, the State economy plays a key role.

Secondly, the economic mechanism is the social market economy; a school of economics represented by Paul Samuelson – a Nobel Prize Economist in 1970 – with his theory on mixed economy. Its argument is that the market economy under the management of the State, so the economy is operated by two hands: market and State. This helps promote optimal allocation of social resources to maximize profits through competition. At the same time, the management of the State helps avoid the failures of the market, such as inflation, social disparity, economic crisis…

Interview 2: market economy in Vietnam

Due to the intense pressure of the domestic and international situation, we have no other way but to renew. The first activity in the process is the renovation of thinking in which economic thinking should be renewed first and foremost. In my opinion, the process of renewing the economic thinking from the local to the global level is completed step by step through every Party Congress. In particular, the 2006 Party Congress outlined the socialist orientation in the market economy in Vietnam towards a multi-sector economy. This economic model in Vietnam still obeys the rules of market economy. Up to now, Vietnam has acknowledged the practical existence of many forms of ownership, many economic sectors other than the state ownership and the state economy. On this basis, various proper guidelines and orientations has been brought out to promote a commodity economy with various forms of ownership and economic sectors; thereby all resources have been mobilized for building the national economy.

This is a breakthrough in changing economic thought, helping liberate the production force that was constrained in the previous centrally-planned economy.

(Interview with Associate Professor, Dr. Hoang Van Hai, Director of Institute of Business Administration, School of Economics, Vietnam National University, Hanoi)

Thirdly, the economy is oriented toward socialism. Before Innovation, the State of Vietnam was of the view that, the market economy is a capitalist economy and does not operate very well. After Innovation, the State of Vietnam has changed and is of the opinion that the market economy is the general achievement of humankind and is not contradictory to socialism. Socialist orientation is understood to mean that the State-owned sector continues to hold a key role in the economy, because according to Marxist socialism, all means of production are owned by the people and the socialist State is a representative State.

And finally, economic innovation has been a transition from a closed-door economy to an open and internationally integrated economy. An outstanding advantage in the economic innovation in Vietnam is its positive and proactive integration into the regional and global economy. The great expansion of international relations and international trade has created favorable conditions for Vietnam to promote its comparative advantage.

4. Major Achievements of Vietnam's Economic Innovation

It can be said that the most significant achievement of Vietnam's Innovation after 34 years has been its transition from a bureaucratic and central planning economy based on the agricultural economy to a market economy. Thereby, the country has been able to get rid of the outmoded method of development. This has become an irreversible trend. This is the result of the continuous development of innovation thinking. The major achievements can be seen in the high economic growth, the reduction of poverty rate, economic structure shifting towards a positive direction, development of foreign trade, attraction of more FDI and ODA, proactive and positive opening and integration into the world economy.

Regarding the economic growth, Vietnam's economy has achieved a growth rate much higher than that of the pre-innovative period. In the initial stage of the Innovation (1986-1990), the annual GDP growth rate was of only 4.4%. But since 1990, Vietnam's economy has gone through nearly 20 years of impressive growth. In the second phase of Innovation (1991-1995), the annual GDP growth rate was of 8.2%, almost doubled the previous 5 years. In the following 5 years (1996-2000), despite the adverse effect of the regional financial crisis (1997-1999), Vietnam could manage to maintain the annual GDP growth rate of 7.6%. In the period from 2001 to 2005, GDP increased at 7.34% per year. In the period from 2006 to 2010, due to the slowdown of the world economy, Vietnam's GDP growth rate also reduced, yet could maintain at 6.32% per year (Vuong Dinh Hue 2016). In the following years, Vietnam continued to be affected by the global financial crisis of 2008 and public debt crisis of 2010, however, the current GDP growth rate of Vietnam is considered a relatively high rate in the region and in the world (Vuong Dinh Hue, 2016), and by 2018, it reachers 7.08% (Statistical Book of Vietnam, 2018).

The highlight of Vietnam's Innovation is not only the high growth rate, but it is its inclusiveness. The poverty rate reduced from over 85% of the population (according to the poverty line USD 2/person per day) in 1993 to 13% in 2013; extreme poverty (according to the poverty line USD 1.25/person per day) almost disappeared, while inequality did not rise much and is still within the average rate of the world (World Bank, 2019).

The scale of the economy has increased rapidly. In 2003, after 16 years of Innovation, GDP per capita of Vietnam was USD 471/year (Tran Dinh Thien, 2015) but in 2018, per capita income was nearly USD 2,600 (Statistical Book of Vietnam (2018). The productive forces have made progress both in terms of quantity and quality; the production technology has been improved. Macro-economy is largely stable; inflation is under control.

The economic structure of Vietnam has started to shift towards modernity. The composition of the economic structure has shifted in the direction that the agricultural sector is reduced; the industrial and service sectors are increased. The composition of the economy continues to shift toward promoting the potentials of all economic sectors and multiple forms of ownership.

The proportion of agricultural sector in GDP fell sharply, from 47% in 1988 to 18-20% in 2000 and has continued to fall until now. According to yearly Statistical Book of Vietnam, on the contrary, the proportion of industrial sector increased rapidly, from about 23% by the end of the 1980s to nearly 40% at present. The proportion of the service sector has also increased steadily and its contribution to the GDP structure has been quite stable, currently accounts for more than 40% (Statistical Book of Vietnam, 2018).

Regarding labour structure, agricultural labour force which accounted for more than 2/3 of the labor force in the period 1986-1990, has continuously reduced to about 6% in 2013 (Statistics of WDI). The industrial labour force increased proportionately: each year there is about 1% of workers moving out of the agricultural area and turned to the industrial area (Tran Dinh Thien, 2015).

Another point of achievement of Vietnam Innovation in economic growth is *FDI attraction*. FDI started to flow into Vietnam when the foreign investment law was enacted in 1987 and the market was opened. However, it was not until 1991 that FDI became a significant force. In 1994, the scale of FDI was equivalent to 10% of national GDP and made a significant contribution to the high growth rate of the country's economy in the years before the Asian financial crisis (Tran Dinh Thien, 2015). In the first wave of FDI, Vietnam reached a peak in FDI attraction in 1996, one year after Vietnam joined ASEAN. The same thing happened when Vietnam joined WTO in 2007 and FDI reached a peak in 2008.

By the mid-1990s, FDI enterprises contributed ¼ of the total industrial production value and accounted for over 6% of GDP (Tran Dinh Thien, 2015). Ten years later, the shares were 43.8% and 15.99%, respectively (Tran Dinh Thien, 2015). FDI has risen above the domestic industrial production value since 2014, ahead of export turnover since 2004 (Tran Dinh Thien, 2015) and FDI enterprises currently contribute about 23.5% of total social investment (nearly 20% of GDP), accounting for over 70% of export turnover (Pham Thien Hoang, 2019).

The structure of exports has improved significantly. Export turnover regularly increases at a double-digit rate. Vietnam's exports have increased rapidly with a high growth rate of over 15% in the period from 2011 to 2019 and officially reached a turnover of USD 500 billion in mid-December 2019 (Song Ngu, 2019). In 2011, there were 21 items with export turnover of over 1 billion USD, accounting for 81% of total export, whereas by 2019 there

are 32 items. In which, there are 8 items exported over 5 billion USD and 6 items exported over 10 billion USD, accounting for 92.86% of the total export (Agency of Foreign Trade, 2019). Exports shifted towards increasing the proportion of industrial products and reducing the proportion of agricultural products. Key economic zones have been founded, which are to be the force for the growth of the regional and national economy. Economic and industrial zones have been developed in order to attract investment, at the same time to establish specialized regions of certain crops and livestock linked with the processing industry.

Various sectors of the economy have witnessed rapid development. The industrial and construction sectors have maintained a fairly continuous growth. Industrial products have become more diversified and its quality improved, thereby enhanced its competition capacity, ensured the supply and demand of the economy, maintained a stable domestic market and expanded export market; given priority in the development of several new and hi-tech industries. The agricultural sector has maintained a relatively stable development. Rural industrialization and modernization have made an important shift. From a malnourished country, Vietnam has become the 2nd largest exporter of rice in the world, contributing to the international food security. Vietnam has also exported a large quantity of coffee, rubber, cashew nuts, pepper and seafood. The service sector has become more diversified; better meet the demands of production and people's life: tourism and telecommunication develop at a rapid rate; bank and finance services, legal counselling have become more efficient. The exploitation and use of national resources associated with sustainable development has received attention. Socio-economic infrastructure has been improved, especially transport, electricity, communication, telecommunications, irrigation, urban infrastructure, education and health care. The application of science and technology, especially high technology, has created preconditions for the building of a knowledge economy.

After 34 years of Innovation, Vietnam has made important institutional developments, giving the shape to a socialist-oriented market economy. Under the leadership of the Communist Party, the ideology and policy of development of a socialist-oriented market economy has been institutionalized into laws, creating a legal framework for an efficient economic operation. In 34 years of Innovation, the Constitution has been amended 3 times, over 150 laws and 70 ordinances have been issued. Recently, the Congress has passed the 2013 Constitution, thereby created a legal basis and promoted the institutionalization of the socialist-oriented market economy. It is to affirm the principle of a multi-sector economy, with multiple forms of distribution. It is also to affirm the principle of a uniform development of market elements and the smooth operation of all market categories. The state management of the economy in accordance with the principles of the market economy has been affirmed. The principle of social justice and progress has been implemented to a certain extent. The principle of open door, integration into the regional and international economy is affirmed.

Thirty-fourth years of economic innovation has seen *the positive role of economic actors in the national economy, free trade and competition in accordance with the law*: state owned economy gradually asserts its leading role; state-owned enterprises are gradually restructured, equitized under the Enterprise Law and declined in number. The collective

economy is reformed. New forms of cooperation are founded to suit the market mechanism. Private economy increased rapidly, which help improve business efficiency, create new jobs, and make a significant contribution to GDP. FDI economy is encouraged, foreign-invested enterprises have contributed remarkably to the implementation of the socio-economic development goals, reduce unemployment and increase exports. Social organizations and trade unions have played a more important role in the economy. The socialist law-governed State, under the leadership of the Vietnam Communist Party is being finalized, state apparatus has been refined. Innovation is seen not only in thinking but also in implementation.

The process of Innovation has helped establish uniform market elements and all market categories which operates smoothly, and is well integrated with regional and international markets. The scale and commodity structure of the markets is improved. Trade infrastructure, services, management mechanism, competitiveness… are all better. Financial and monetary markets have seen a dynamic and strong development. Besides the capital mobilization through banking channel, the formation of stock markets helps to diversify investment sources. At the same time, the operation of the insurance market has made a positive contribution to the stabilization of production and people's life. Real estate market is developing rapidly. The labour market is formed on a national scale. Sciences and technology markets are in the process of formation. The number and value of the technological transaction have increased markedly in recent years. The market of some basic public services, especially health care and education, have made new developments, for example, the mobilization of non-state resources.

Besides, *economic growth is largely in harmony with cultural evolution, social and human progress, social justice, environmental and natural resource protection.* Previously, the State had taken charge of the subsidiary system and employment allocation. After Innovation, new mechanisms have been established and policies have been made in order to maximize the participation of various economic sectors and labours. Previously, the State had not encouraged people to do business for fear of social disparity between the rich and the poor. After Innovation, the State encouraged people to do business in accordance with laws, which helped in reducing poverty in the country. Social security is largely ensured. Synchronous development is made in social and welfare system, especially in poverty reduction, employment, social insurance system, preferential policies for the veterans, and health care policies for all. In the difficult situation of the economy, Vietnam has increased the government budget and mobilized resources to implement social policies. Vietnam has completed ahead of schedule many Millennium Development Goals of the United Nations.

Thirty-fourth years of Innovation has been a long way of *deep and extensive international economic integration at many levels,* according to the principles and standards of the global markets. Vietnam has been able to set up many strategic economic partnerships. It has also made a positive contribution to the establishment of ASEAN Community in 2015. Domestic markets are more fully developed according to WTO commitments. As of 2020, Vietnam has negotiated, signed, and implemented 16 free trade agreements (FTAs) with nearly 60 partners; of which 12 FTAs have been implemented, 1 FTA was signed but not yet in effect and 3 agreements are in the negotiation round (Bui Thanh Son, 2020). The participation of Vietnam in the negotiation of FTAs has made a positive contribution to the

economic development of the country. It helps improve the country's competitive capacity. This is especially meaningful as Vietnam have been involved in three value chains which play an increasingly important role in the global economy, i.e.: food and food security value chain; energy and energy security value chain (oil, gas and coal); and textile and footwear value chain (Vuong Dinh Hue, 2016). Currently, Vietnam has stepped up its participation and implementation of new-generation FTAs in which the Comprehensive and Progressive Agreement for Trans-Pacific Partnership officially came into effect on January 14, 2019 and the Vietnam-EU FTA (EVFTA) was signed on June 30, 2019. After Vietnam signed and participated in a series of free trade agreements (FTAs), it became a highly open economy (reaching over 200% of GDP in 2018) (Pham Thien Hoang, 2019).

Interview 3: FTA in Vietnam

Joining new-generation FTAs is an opportunity for Vietnam to implement the policy of perfecting the socialist-oriented market economy institution, the legal system; improving the investment and business environment towards ventilation and transparency and international standards.

Besides great opportunities, Vietnam also faces many difficulties and challenges from implementing new-generation FTAs.

The implementation of the "new generation" agreements requires us to have a suitable roadmap and comprehensive solutions, i.e. to complete the institutional and legal system along with activities of information, propaganda, knowledge dissemination and capacity building for officials of ministries, departments and branches, localities and enterprises to ensure taking advantage as well as avoiding violations of CPTPP and EVFTA.

(Interview with Professor, PhD, Do Duc Binh, National Economics University, Vietnam)

5. Issues of Economic Innovation in Vietnam

Besides the major achievements mentioned above, the process of Innovation in Vietnam has also faced many challenges and hindrances. It is not difficult to realize that the economic growth rate is not truly adequate with the potentials and opportunities of the country. Some limitations of the Innovation process are: the low quality of growth; the process of restructuring of the economy has not been as expected; issues of labour productivity and enterprises…

Firstly, low quality of growth

The economic growth of Vietnam largely relies on the exploitation of resources, the increase of capital investment and cheap labour. Industries based on the exploitation and use of natural resources such as agriculture, forestry, fisheries, mining… always occupy a large proportion of GDP (about 30% during the period 1991-2009). The dynamics of growth and economic restructuring has been the processing and assembling industries which require high intermediate costs and are dependent on imports, often cause environmental pollution and have made no remarkable growth. Export turnover has

increased at a rapid rate, yet the export structure has changed slowly, focused mainly on exporting crude commodities and minerals. The competitiveness of exports is low.

Secondly, low quality and inefficiency of investments

The growth and restructuring of the economy have become more and more dependent on FDI. Yet, this capital source has not been allocated proportionately, is of low quality and has not contributed markedly to the quality of growth. The investment structure is not rational, use of capital investment, especially state investment, is not efficient. The efficiency of investment is expressed in the Incremental Capital – Output Ratio (ICOR) (capital investment/GDP ratio). According to the calculation of the General Department of Statistics, the period from 1991 to 1995, the ICOR was 3.5; the period (1996-2000) was 4.8; the period (2001-2005) was 5.1; it was 8 in 2008, 2009.[8] It is to be noted that in the area of public investment, especially state-owned enterprises, ICOR has been very high, which was 12 in 2009, while the general ICOR of the economy was 8. However, ICOR decreased in the period from 2016-2018, which were 6.42, 6.11 and 5.97 respectively. In recent years, investment efficiency and competitiveness have been improved by many new production capacities added to the economy but still far from ICOR at 3.0 to achieve investment efficiency and sustainable development (SBV 2019).

Thirdly, the foundations for economic growth (macroeconomic stability, socio-economic institution, basic health care and education, infrastructure) are inadequate, competitive capacity is slow in improving. Factors contributing to the quality of growth and competitiveness of the economy (quality of human resources, productive elements such as labour, land, technology, and innovative capacity) are weak and inadequate.

According to the Report of the World Economic Forum (WEF) as a result of a survey in 133 countries and territories, Vietnam has a very low index of infrastructural quality (111/133), quality of roads (120/133), quality of power supply (103/133), the cost of basic education (103/133), quality of training and management schools (11/133). According to the WEF Report on global competitiveness, the competitive capacity of Vietnam from 2001 up to now has hardly been improved. It has even been relegated in terms of competitiveness in recent years.

Fourthly, in reality, there are no close links between economic growth and social progress. High economic growth is not always accompanied with sustainable development and poverty reduction. Economic growth has also generated some urgent social issues: employment for workers, increasing gap between the rich and the poor, disparity in the level of development and income… among regions, environmental pollution and recession, increasing problematic social ills, especially drugs and prostitution.

[8] The high ICOR (Incremental Capital – Output Ratio) means low investment efficiency and low competitiveness. According to the recommendation of WB, the ICOR at 3 shows an efficient investment and a stable and sustainable development of the economy in developing countries.

The process of economic restructuring of the economy has not taken place as expected.

The scale of the state-owned sector has not reduced. On the contrary, it has increased. Employees working in the public sector by the end of 2013 were over 5.33 million, a strong increase compared to 4.794 million by the end of 2009. This explains why regular expenditure in the state budget tends to increase day by day, reaching about 70% of the national budget at present. Equitization of State-Owned Enterprises (SOEs) is superficial, the proportion of state ownership is maintained "overwhelmingly" in order to keep "socialist orientation". But in fact, it is a hindrance to change in the governance structure. Thus, the goal of improving the efficiency of enterprises is not achieved. It gives chances to interest groups to steal profits. That explains why investment effectiveness and ICOR is hardly improved.

A similar situation happens to the restructuring of Credit Institutions (CIs). Solutions to bad debt currently aim at "cleaning up" the grounds, dismantling temporary barriers. It has not thoroughly solved the bad debt issue according to market principles. Governance structure and operation of credit institutions has not much changed.

Restructuring of public investments seems to have made some progress when the proportion of public investment/GDP tends to decrease in nearly one decade. But as mentioned above, this does not mean that the amount of capital investment of the public sector decreased, but it is because investment in private and FDI sectors has expanded significantly. State budget deficit has often been at a high level (almost always at 5% GDP). Regular expenditure constantly increases. These are evidences of the unsuccessful efforts at administrative and public sector reforms. Borrowing situation (through debenture issuing) to reconvert the old debt of the Government may lead to incalculable consequences in long-term growth, because this will further increase debts in the future.

Domestic private enterprises have not had sustainable growth.

In the last 3 years, the number of bankrupt or deactivated enterprises has increased. In 2010, 47,000 enterprises stopped functioning. In 2013, the number was 61,000. In the first half of 2014, it was 34,000 (World Bank, 2014). The causes behind these numbers are partly due to the domestic and external economies have not recovered. But the major cause is that enterprises are not able to find a market or to get access to loans. In addition, the input costs are rising. Nearly 95% of Vietnamese enterprises belonging to the category of "small and medium-sized enterprises (VCCI, 2014) [in reality, they are small and super small enterprises], and only about 15% of them have access to official credit. SMEs tend to find informal sources of credit rather than from the banks due to the constraints of collateral security. On average, each SME in Vietnam lacks of $42,000 credits (Wignaraja and Jinjarak, 2014 – ADB working paper).

On the other hand, the technological capacity of domestic enterprises is also a problematic issue. In 2011, only 0.005% of enterprises had scientific initiatives (VCCI, 2014). Report on the global competitiveness in 2012-2013 of the World Economic Forum (WEF, 2013) shows that the level of technological absorption of Vietnam is very low (98/133). Moreover, the size of enterprises tends to become smaller. In 2007, the proportion of super

small enterprises accounted for 61.4%. In 2012, it increased up to 66.8% (VCCI, 2014). Some enterprises have become larger not because of production development, but thanks to the process of property speculation and investment. This is most evident in the real estate industry. Vietnam has no industrial billionaires. Even some strong domestic brands have been lost to foreign investors. For example, Kinh Đô has sold 80% of its share to Mondelèz International.

Labor productivity is low and the growth of labor productivity tends to decrease.

This is another challenge of long-term growth targets in Vietnam. In the 1990s, a high economic growth rate was accompanied by a rapid growth rate of labour productivity (World Bank, 2013), but thereafter, the growth rate of labour productivity declined sharply. During the period 2000-2006, labour productivity increased by nearly 6%/a year on average, which reduced to about 3%/ a year during the period 2007-2013 (CIEM, 2011). This shows that after more than 2 decades of Innovation, Vietnam's economy was not able to reach Lewis's turning point which means that the economy is still in the process of transition from the agricultural sector to industrial and service sectors. It has not achieved a high level of industrial accumulation. The shifting to an industrial and modernized economy seems not to have started. The target of reaching a per capita income of $3.000 in 2020 (in the Socio-Economic Development Strategy 2011-2020) has become impractical, because this means that from 2015 onwards, Vietnam must have the growth rate of per capita income at least 10% per year.

Growth of labour productivity is closely linked with labour's skills. Employers in Vietnam are facing many difficulties in finding skilled workers, although they are willing to pay higher wages (World Bank, 2014). This situation is very paradoxical if we look at the PISA results of Vietnam. However, it indicates the fact that the educational system of Vietnam has been doing well in transmitting academic knowledge; it has not been successful in turning this knowledge into working skills.

Numerous negative impacts come from environmental pollution, climate change and epidemics.

For more than three decades, Vietnam has focused almost exclusively on economic innovation and neglected its environmental protection leading to environmental pollution of soil, water, air and noise. This phenomenon takes place in many industrial zones, big cities such as Hanoi, Hai Phong, Ho Chi Minh City and craft villages. To name a few, water pollution in the Thi Vai River, Dong Nai or the Formosa disaster in Ha Tinh have seriously affected coastal ecosystems in 6 provinces in Central Vietnam ...

Climate change is having adverse impacts on sustainable development in the Mekong Delta. For example, continuous drought occurs in the central provinces such as Binh Thuan, Ninh Thuan, and Central Highlands; Salt-water intrusion has been becoming more and more serious in the Mekong delta since 2018 reaching its peak in early 2020 when the saline water reaches 80 to 100 km in width in some main rivers.

The biggest challenge for economic innovation in Vietnam in the coming time is to handle the consequences of human and cattle diseases such as COVID-19 in humans and African swine fever in pigs, Bird flu H1-N1….

Conclusion

In brief, thirty-fourth years of Innovation is a significant period in the history of Vietnam's development and modernization. The socialist market-oriented economy is gradually taking shape; institutions of the socialist market-oriented economy have been formed and improved. The investment environment is constantly improved. Position and strength of Vietnam in the international arena is enhanced. This helps promote industrialization and modernization and improve the quality of life of the people. At the same time, we are also aware of the remaining limitations and challenges of the economy. It is important to attend to these challenges if we are to aim at rapid and sustainable development. Naturally, dealing with these issues will take time. It is believed that, with the high political will of the leadership of Vietnam and the consensus of the majority of the people, the obstacles on the path of the Innovation will gradually be resolved. Also, we are to realize that, these limitations are inevitable consequences of the market economy mechanism and we have to learn to live with it and to implement specific measures to reduce its negative impact. The internal economic situation and the commitment to international integration require Vietnam to implement early fundamental and systemic institutional innovations rather than merely partial innovations. The second innovation is being demanded by reality (Le Dang Doanh, 2016).

It should be noted that, in order to deal well with the challenges or issues facing Vietnam as mentioned above, the second economic innovation suggested by many Vietnamese scholars needs to be fostered. In fact, Vietnam has been continuing to renovate its economy and during economic innovation period, however, in this second economic innovation, it is necessary to be institutionalized in official documents of the Communist Party and the Government of Vietnam. It should clearly define the goals and implications both in terms of the theoretical and practical models of the second economic innovation process. It should also state what contents it can inherit from the first economic innovation (since 1986) and what it should develop in the 2nd economic innovation.

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APPENDIX

Index of Vietnam Economic Growth during Inovation Period (1990-2018)

Indicator \ Year	1990	1995	2000	2005	2010	2015	2018
GDP per capita (current US$) (billion USD)	98.03	288.02	433.33	699.50	1333.58	2107.01	2452.14
GDP growth (annual %)	5.101	9.540	6.787	7.547	6.423	6.679	7.076
Exports of goods and services (% of GDP)	36.039	32.813	49.966	63.699	72.002	89.779	102.475
Imports of goods and services (% of GDP)	45.277	41.908	53.278	67.015	80.215	88.988	105.832
Merchandise trade (% of GDP)	79.676	65.607	89.539	120.075	135.489	169.845	199.756
Inflation, GDP deflator: linked series (annual %)	42.095	17.040	11.594	9.204	12.074	-0.191	3.398

Source: Tradingeconomic.com/World Bank, https://data.worldbank.org/country/vietnam.

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EXAMINING THE CHARACTERISTICS OF THE LEADERS IN NON-PROFIT ORGANIZATIONS

At almost every moment of our lives, we are in contact with organizations. Our daily actions are greatly influenced by organizations around us, from school and non-profit organizations to workplaces. In our study, we deal with the particular case of non-profit organizations.
The current study provides a deeper insight into the factors of effective leadership of non-profit organizations. The research conducted in the period from 2018 to 2019, made it possible to establish that the leaders of Hungarian non-profit organizations mostly belong to the transformational leadership style. Our purpose with this study is to provide an understanding of the leader's characteristics which has an impact on non-profit organizations' operating.
JEL: M10; M12; M13

Introduction

In the first half of the 1990s, non-profit organizations that appeared after the collapse of the eastern European socialist systems took over some of the former duties of the state. Some common features of non-profit organizations which do not divide profits between stakeholders or directors are that they operate independent of the government and are institutionalized. They also govern themselves, are based on non-mandatory membership,

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and rely on self-employment. The non-profit organization is characterized by volunteering, charity, citizens' initiatives, public benefit and public service. Overall, it can be said that non-profit organizations deal with problems that the socio-economic sector has not solved. Therefore, non-profit organizations are important and necessary, so it is worthwhile to research elements of their leadership style.

The main difference between profit and non-profit sector is that any profit that is made in the non-profit sector is used for the organizations' mission and not for profits to the organization's owners (Andreasen, Kotler, 2008).

The groups around non-profit organizations consist of clients, volunteers, donors. Clients are those who are the beneficiaries of the organizations' output while volunteers and donors supply the non-profit organization with various resources, for example, working time, money, knowledge, etc. (McLeish, 2011).

In nowadays fierce market conditions the non-profit organizations face a number of challenges. According to Tschirhart and Bielefeld (2012) one of the most important challenges for non-profit organizations is keeping continuously their mission in mind. Another critical point that can be considered as a challenge in the non-profit sector is a heavy reliance on volunteers. The main problem is often a different motivation of the volunteer and a paid worker in the for-profit sector and usually, this leads to more difficult human resources management practice in the non-profit sector (Andreasen et al., 2005).

Leadership in non-profit organizations is an area of study which has a lack of the attention of both the academic researcher and the non-profit organization practitioner. According to Green (2009), the five basic problems of the non-profit sector include the lack of funding, government regulation, insecurity of funds, lack of volunteers, and the 'lack of good leadership'.

Leaders play a significant role in the development of the non-profit organization, they inspire, motivate, and encourage those who make up these organizations. The intent of our research is to understand the role of a leadership in the non-profit organizational setting. To achieve this goal, we would like to examine how the leadership style influences the non-profit organizational performance. This paper seeks to contribute to the emerging literature on leadership in the non-profit sector by exploring leadership in practice.

Theoretical Background

Over the last century, there has been considerable theoretical and empirical work conducted on leadership theories. During the past decades, the impact of leadership styles on organizational performance has been the main topic of interest among academics and researchers (Yukl, 1999; Hofmann, Jones, 2005; Rowe et al., 2005; Tatar et al., 2017).

Several studies are shows how to improve the efficiency of organizations through the improvement of the leadership style, the use of various instruments of the influence of leaders on employees. In some of the research, it is noted that leaders in their work as incentives use the possibility of self-realization, collegiality in making managerial

decisions, favorable working conditions, good internal communications (Sahraee, Abdullah, 2018; Liu, Perry, 2016). Organizational leadership has been defined as an interpersonal process for influencing individuals to achieve organizational goals (Noda, 2005).

According to House et al. (1999) leadership is "the ability of an individual to influence, motivate, and enable others to contribute toward the effectiveness and success of the organization".

For the purpose of effectiveness, every organization must exploit the full potential of its employees, and leadership plays an essential role in this process. Burns (1978) considered that leadership is the key factor in directing all organizational components towards effective accomplishment organizational goals and it needs to provide interaction between all members of the organization.

Several kinds of research on the relationship between leadership style and motivation have shown that leadership style influences employees' motivation. According to Kotter (1990) the leader has to communicate with the employees, support cooperation, and motivate and inspire the employees in order to create a commitment to the goals.

According to great man theories, the leaders are born, not made. The basic of the trait theory was an assumption that some people are natural leaders and therefore possess personal attributes that other people do not have (Tannenbaum, Schmidt, 1973).

Kouzes and Posner (1987) asked in their study the workers and lower-level managers what the characteristics of superior leaders were the first two choices were honesty and competence.

In theory, there are three basic leadership styles: autocratic, democratic and laissez-faire (Lewin, Lippit and White, 1939). Autocratic leaders make all the decisions themselves, they do not consult their team. This kind of leader is likely to ignore suggestions made by subordinates. Democratic leaders take an active role in the decision-making process but they involve others. In contrast, laissez-faire leadership behaviour or 'hands-off' leadership is where leaders avoid accepting their responsibilities. Laissez-faire leaders have very little involvement in decision-making, mostly leaving everything up to their subordinates.

Modern theories of leadership have tended to focus more on the interaction between leaders and followers, as well as the situational context. For example, Fiedler's (1967) contingency theory suggests the success of a leader depends on a given situation's favorability.

Table 1

Main leadership theories

Theory	Main representatives
Great Man or Trait school	Tannenbaum and Schmidt, 1973
Behavioral school	Lewin et al., 1939; Blake and Mouton, 1964; Skinner, 1974; Kouzes and Posner, 1987
Situational school	Hersey and Blanchard, 1977; Vroom and Yetton, 1973
Contingency school	Fiedler, 1967
Transactional and Transformational school	Bass and Avolio, 1990; Burns, 1978

Hersey and Blanchard's (1977) situational leadership theory is one of the famous theories in the field of leadership. In this model, a leader applies different leadership styles according to a subordinate's maturity level.

Vroom and Yetton (1973) in their model, five decision processes were specified that ranged from highly autocratic through consultative to highly participative.

The two leadership theories that have dominated the New Leadership Theories are transactional and transformational (Woods, 2007). According to Bass and Avolio (1990), the transactional leader understands employee's needs and makes provision to meet the needs through the given reward. Employees' relationship with the transactional leader is based on the outcome of their performances.

Burns (1978) argues that transformational leadership is when 'leaders and followers help each other to advance to a higher level of morale and motivation'. Transformational leaders inspire people because they expect the best from them, they communicate a shared vision, they are self-aware and highly empathetic.

According to Naylor (1999), the effective leader must be visionary, passionate, creative, flexible, inspiring, innovative, courageous, imaginative, experimental, and initiates change.

Humane oriented leadership draws especially on the moral or ethical school of leadership theory (Ciula, 1995). According to Trevino et al. (2000), ethical leaders personify certain traits such as honesty, integrity, truthfulness, openness to input, respect and principled in decision making, and concerns for others. De Hoogh and Den Hartog (2009) defined ethical leadership as the process in which a leader influences group activities to the attainment of the organizational goals in a socially responsible way.

Greenleaf (1977) defined servant leadership as the one who emphases on empowering and development of followers. According to Buchen (1998), empowerment is one of the most important characteristics of servant leadership. Empowerment is entrusting power to others, and involves effective listening, making people feel significant, putting an emphasis on teamwork (Russell, Stone, 2002).

Non-profit organizations are created by civil society and rely on volunteers who dedicate their efforts to mitigate social problems (Drucker, 1990). They actively participate in youth, students, implementing the principles of self-employment (Demchenko et al., 2017).

According to Estrada and Garza Carranza (2016) leaders of the non-profit organizations generally tend to face a greater need to adapt to changing economic means and need to encourage team spirit, sense of belonging, inspiration, motivation, and integration of staff (mostly volunteers).

Non-profit leaders exhort staff to greater effort on behalf of their mission. Effective non-profit leaders embody passionate missions (Dym, Hutson, 2005).

Leaders in the non-profit sector differ from the leaders of profit-oriented organizations. Dobbs (2004) suggests that relationship building is very important in non-profit leadership (thinking in the 'social collective'). For a non-profit organization's vision and mission to be efficient, they must involve the organization's culture and must be evaluated internally and

externally. Internal evaluation involves how the organization is interpreted by its members. External evaluation – which involves all the stakeholders – is valuable because it offers a different viewpoint (Dimitrios et al., 2013).

Lindberg (1999) states that it is difficult to manage a non-profit organization because the leaders are expected to be effective in their work and at the same time stand up for their organization's ideals and values. Furthermore, also be difficult to manage non-profit organizations since part of the working force is employed while others work voluntarily, which could create conflict between employees.

Summarizing the literature review, leadership has extensive literature, but there are fewer studies on the leadership of non-profit organizations, so it is definitely worth researching further.

Research Aim and Objectives

The purpose of this paper was to examine Hungarian non-profit organizations to see how leadership characteristics relate to these organizations effective operation. This research further suggests that the interrelationship of leadership and employee seems to foster a synergy that may have qualities that achieve an effective organizational performance. The above view also supported by many researchers (Knies et al., 2016, Lowe and Kroeck, 1996, Yammarino et al., 1993) who argues effective performance by an individual, group, or organization is assumed to depend on leadership.

In order to achieve the aim, this paper has the following objectives:

1. *To evaluate the characteristics of leaders in Hungarian non-profit organizations.*
2. *To analyze the impact of leadership on the performance of non-profit organizations.*

In order to find answers on the paper objectives, the following research questions are defined:

What are the main characteristics of leaders in Hungarian non-profit organizations?

What is the relationship between the leadership style and organizational performance in Hungarian non-profit organizations?

Methodology

To collect data, we chose the mixed method. The mixed-method is widely used to collect primary data in social science research. Mixed methods research is a methodology for conducting research that involves collecting, analyzing and integrating quantitative (e.g. surveys) and qualitative (e.g. interviews) research. This approach to research is used when this integration provides a better understanding of the research problem. According to Stentz et al. (2012), the mixed-method approach can develop more complete and complementary understandings, and increase the validity of results.

Qualitative methods were used within the first phase, using semi-structured interviews for the exploration and examination of opinions regarding the importance of the topic. Interviews are some of the most widely used data collection methods in qualitative research. Easterby-Smith et al. (2014) argue that interviews are the best method for gaining information. This is because the researcher can gain an understanding of the phenomenon based on the interviewees' own perspective. Interviews can be divided into structured, semi-structured or unstructured interviews (Saunders et al., 2012). In our research, we used the method of semi-structured interviews. These interviews have an outline of predetermined questions or themes to be discussed during the course of the interview, but the interviewer is free to moderate the wording and sequence of the questions. Another important characteristic of semi-structured interviews is that there is a possibility to ask clarifying and supplementary questions to form a better understanding of the interviewee's views on the topic.

Table 2

Research structure

Literature review
Methodology
Data collection (interview and questionnaire survey)
Research findings, conclusions

Source: Designed by the authors

Each of the interviews lasted for approximately 45 minutes, and in total 10 participants took part. Interviews were conducted in the first half-year of 2019. The participants were leaders of Hungarian non-profit organizations. The interviews were recorded with a speech dictation device and later transcribed verbatim in order to ease the analysis of them.

Within the second phase, we used a questionnaire survey to identify the leadership role and impact on non-profit organizations. A simple random sampling technique was used to select the respondents between 2018 and 2019. A total of 500 questionnaires were sent out via email, from which 364 were fully answered and involved in the research.

Before own research, pilot testing was conducted to help identify and change confusing, awkward, or offensive questions and techniques, thereby enhancing the validity and reliability of the research instruments. Feedback from the pilot test was generally agreed by the respondents that the questionnaire had been constructed in a clear way.

When constructing the questionnaire, we formulated simple and clear questions. The self-filling questionnaire contained both closed (mostly Likert-scaled) and open questions. The first part of the questionnaire asks about the general data of the respondents (gender, age, educational level, etc.). The second part of the questionnaire deals with questions such as leadership style, decision-making process, used motivation tools, and organizational performance etc.

This was followed by questionnaire coding and data entry, data preparation and addressing inaccuracies in the coding. Collected data were processed using Microsoft Excel and SPSS 21.0 software.

All participants were advised that their participation was voluntary. Respondents were also assured that their own identity together with the name of the organizations they work for will remain confidential. It was explained to participants that the questionnaire is completely anonymous and does not include questions asking for any personal details, such as names of participants or names of non-profit organizations.

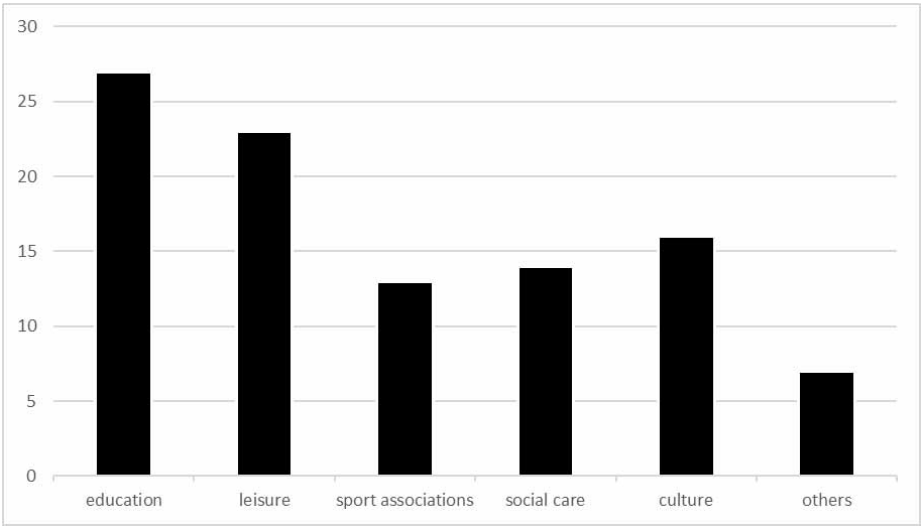
Empirical Results and Discussion

According to data from the Hungarian Central Statistical Office (KSH), by 2018, the total number of non-profit organizations in Hungary was around 62,000 and the total number of people working in the sector was over 142,000 people including 101,000 full-time and 41,000 part-time employees.

Figure 1. is shown that in our research we examined non-profit organizations related to education (27%), leisure (23%), sports associations (13%), social care (14%), culture (16%) and others (7%).

Figure 1

Type of examined non-profit organizations, percentage



Source: own research.

Table 3 represents the main characteristics of interviewees. According to the data, 60% of the interviewees were male, while 40% were female. The interviewees had 2 years to 21 years of leadership experience in non-profit organizations. The experience year and age are a correlation with each other. The youngest interviewees were 36 years at the research time, while the oldest one was 57 years old.

The non-profit organizations are facing challenges everywhere in the world. In our first interview question, we asked from our interviewees *what is the main challenges of Hungarian non-profit organizations*. Figure 2 shows what are the main challenges of Hungarian non-profit organizations.

Table 3

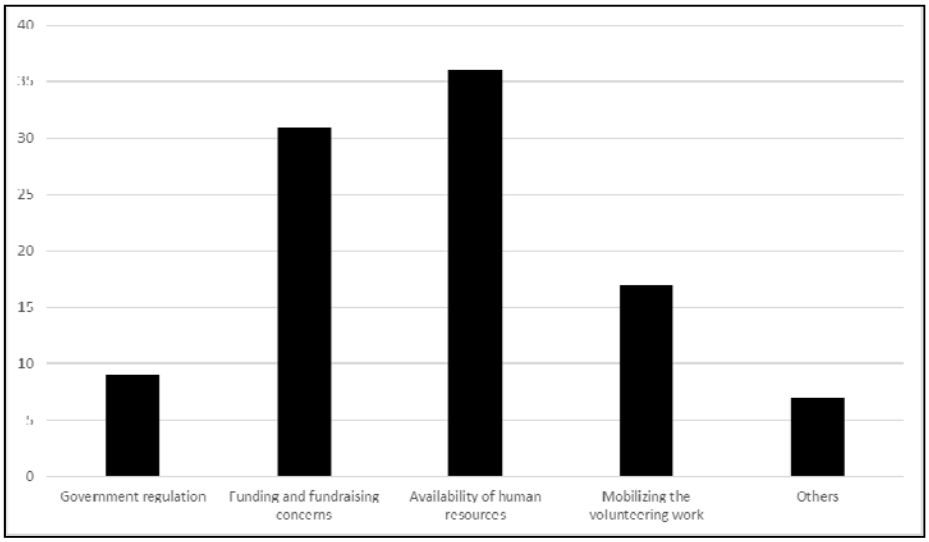
Main characteristics of interviewees

CODE	Age	Gender	Type of non-profit organization	Experience in leadership (year)
INT1	47	male	education	13
INT2	41	female	social care	9
INT3	54	male	sport	21
INT4	43	male	sport	14
INT5	36	male	leisure	3
INT6	44	female	education	8
INT7	57	male	leisure	19
INT8	47	female	social care	14
INT9	52	female	education	20
INT10	36	male	culture	2

Source: own research.

Figure 2

The main challenges of Hungarian non-profit organizations, %



Source: own research.

According to interviewees the main challenges of Hungarian non-profit organizations were the availability of human resources (36%), funding and fundraising concerns (31%), mobilizing the volunteering work (17%) and government regulation (9%). For example, INT4 stated that *"continuously we face the lack of employees…"* Similarly, INT6 indicated

that *"without loyal and committed employees, non-profit organizations cannot be successful..."* INT2 stated that *"governmental funding is vital for us…if is not enough we face big problems...."*. In relation to funding, INT8 stated that *"we should survive and for this, we need support from government and local communities..."* This view was further supported by INT9, who noted that *"we are worried from the government funding structure change..."*. According to interviewees to find volunteers nowadays is an almost impossible mission. Because, very few people want to help wholeheartedly, voluntarily and selflessly for non-profit organizations. In relation to this sentence, INT5 stated that *"finding volunteers to organize programs is almost impossible ..."*.

As described above, non-profit organizations leaders face more challenges than profit-oriented organizations leaders, because they have less budget, which makes it harder to motivate their employees and find the right people to operate the programs.

Table 4

The ranking of the main traits and skills of examined non-profit organizations leaders

Traits and skills of leaders	Rank
Trustworthiness	1
Inspiring	2
Emotional stability	3
Friendly	4
Warmth	5
Courage	6
Self-confidence	7

Source: own research.

The interviewed leaders consider trustworthiness (1st place), inspiring (2nd place), and emotional stability (3rd place) to be the most important traits and skills of the leader that is needed for a non-profit organization to work well.

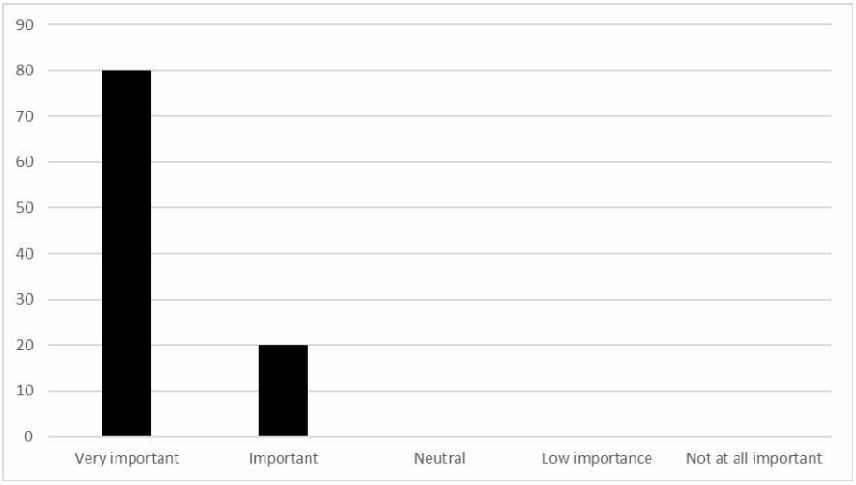
Working with subordinates in non-profit organizations is a very important factor to achieve high organizational performance. In our semi-structured interview, we asked from the leaders: *How important is the personal relationship with employees for them?* The percentage of responses received for this question is shown in Figure 3. Based on the results obtained, it can be unequivocally stated that for the evaluated leaders, the relationship with their subordinates is a very important factor (80%). For example, INT9 stated that *"the personal relationship is important because it has its influence on the work. …"* Similarly, INT3 indicated that *"without subordinates, we are incapable of success and for this important to maintain a favourable relationship with them…"*. None of the interviewed leaders said that, would not be important a good relationship with their subordinates in daily work.

To confirm the above results, in our questionnaire, we asked the respondents how they evaluate the relationship with their leaders?

The result of Figure 4 shows that 74% of the subordinates agree that they have good relationships with their superiors. 21% of the workers believed that their level of relationship is average, while 5% agree they have a bad relationship.

Figure 3

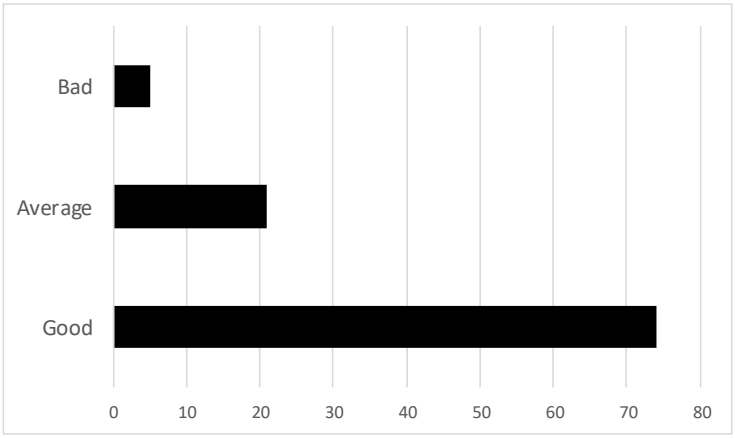
How important is the personal relationship with employees? %



Source: own research

Figure 4

Relationship with the leaders, percentage



Source: own research

In our opinion, the good relationship between the colleagues promotes the effectiveness of workers. Therefore, leaders should strive to establish a good relationship between members of the organization with good communication or a pleasant organizational culture.

Table 5 shows the main demographic characteristics of the respondents, 65.7% of respondents were male and 34.3% were female. We can see that there is a negative

tendency for non-profit organizations in the age group, as there are very few young people among the employees in these organizations. In terms of age, 32.97% of respondents declared themselves to be under 35 years, while 67.03% over 35 years. Most respondents (142 persons) are more than 45 years, followed by those between 35 and 44 years (102 persons). The age group with the smallest representation in the sample (36 persons) was the group between 18 and 24 years of age. If we take a look at the educational background of the respondents, most of them, 191 persons (52.5%) have finished their secondary school education. The following group is the respondents with a university qualification (36.3%). Those who finished primary school make up below 11.3% of the respondents and are mainly from the older age groups. It was found that 26.37% of the employees had 0 to 2 years of experience, while 34.07% had more than 2-5 years of work experience (Table 5).

Table 5

Demographic characteristics of the respondents

Age	**Frequency**	**Percent**
18-24	36	9,89
25-34	84	23,08
35-44	102	28,02
45+	142	39,01
Gender	**Frequency**	**Percent**
Male	239	65,7
Female	125	34,3
Education	**Frequency**	**Percent**
Primary	41	11,3
Secondary	191	52,5
University degree	132	36,3
Work experience	**Frequency**	**Percent**
0-2 year	96	26,37
2-5 year	124	34,07
6-10 year	103	28,30
more than 10 year	41	11,26

Source: own research.

Table 6

Comparison of transformational and transactional leadership qualities

Factor	Transformational Leadership	Transactional Leadership
Time orientation	long	short
Coordination mechanism	goal and value	rules and regulation
Communication	multidirectional	vertical
Focus	employee	financial
Reward system	personal (intrinsic)	organizational (extrinsic)
Source of power	from below	from position
Decision making	decentralized	centralized
Employees	valuable resources	replaceable commodity
Guiding mechanism	vision	profit

Source: Alsayah, 2011.

In our research, we assumed that leaders of non-profit organizations belong to the category of transformational leadership. We based this assumption on the fact that there are many references (Estrada, Garza Carranza, 2016; Geer et al., 2008; Freeborough, Patterson, 2015; Renz, Herman, 2010) in the scientific literature that leaders of non-profit organizations belong to the transformational leadership type.

A transformational leader is a person who stimulates and inspires followers to achieve extraordinary outcomes. In the following Table 7, we show the most important characteristics of examined non-profit organizations leaders.

Table 7

Characteristics of examined Hungarian non-profit organizations leaders

	Mean	Std. Deviation
Importance of teamwork	3,41	0,785
Respect always subordinates	3,78	0,741
Build a balance between power and confidence	3,34	0,561
Values and beliefs are important	3,75	0,597
Considering the moral and ethical consequences of decisions	3,37	0,751
Emphasize the importance of having a collective sense of mission	3,32	0,596
Talk enthusiastically about what needs to be accomplished	3,69	0,562
Vision for the future	3,44	0,743
Express confidence that the team can achieve its goals	3,25	0,751
Seek different perspectives when solving problems	3,27	0,593

Source: own research.

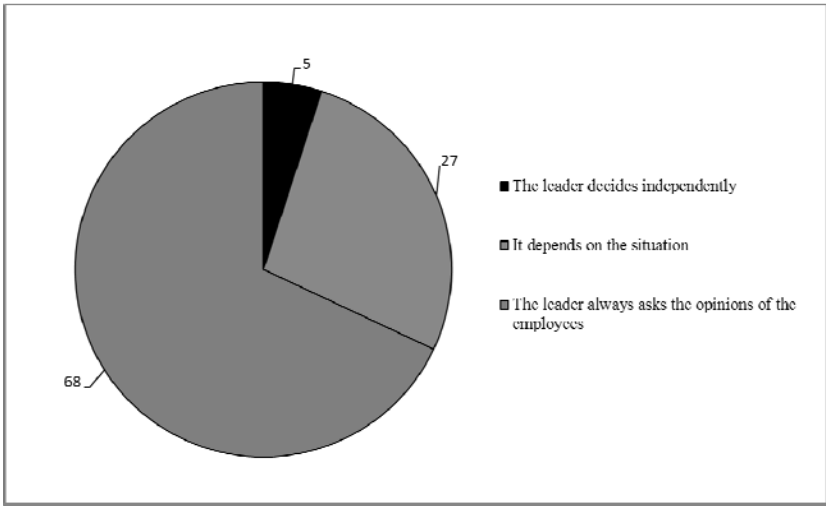
Respondents were asked to adopt a 5-point scale for their responses ranging from 0 (not at all) to 4 (frequently, if not always). The results in Table 7 indicate that our respondents believe they exhibit most of the behaviours listed to a significant extent. All the mean scores are of the order of 3-4. The highest mean is related to respect always subordinates with a value of 3.78, followed with little difference by values and beliefs are important 3.75, enthusiastically talk about what needs to be accomplished 3.69, vision for the future 3.44, and importance of teamwork 3.41, respectively. Finally, it is evident that all transformational leadership factors stand higher than average.

In considering leadership decision making (Figure 5), we came to the conclusion that leaders of non-profit organizations are characterized by a transformational leadership style: 68% of respondents said that the leader asks their opinion before decision making, and another 27% of respondents said that in some situations the leader consults with them before decision making. Only 5% of respondents to the questionnaire said that leaders make decisions alone.

It is important for every organization to find suitable methods for motivating its employees. In our questionnaire survey, we examined the non-profit organizations' employee motivational tools too. According to Figure 6, it can be concluded that in the case of non-profit organizations, recognition and praise (64%) for a job were extremely high as motivating tools. It is interesting that some of the questioned leaders (15%) do not use motivational methods to encourage employee performance.

Figure 5

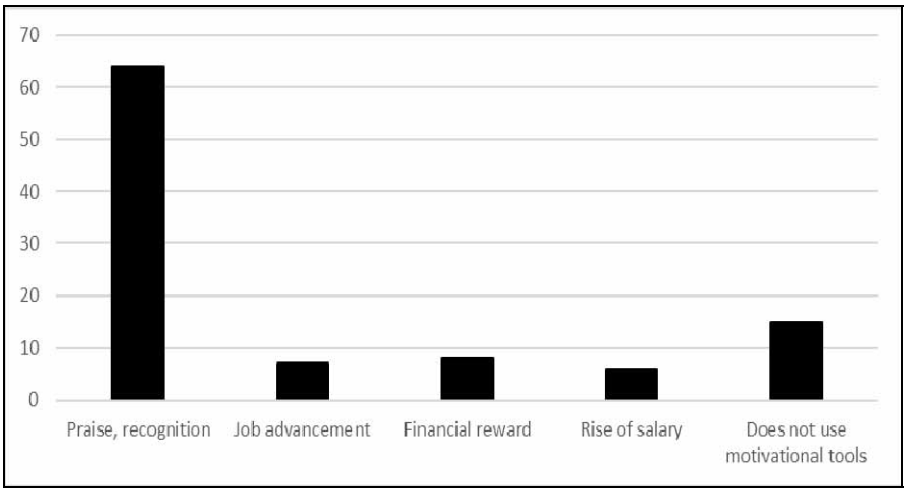
Decision making process in examined non-profit organizations, %



Source: own research.

Figure 6

Motivational tools used by evaluated non-profit organizations, %



Source: own research.

The above result also confirms that leaders of non-profit organizations have less money at their disposal and therefore need to use non-financial incentives to motivate their employees.

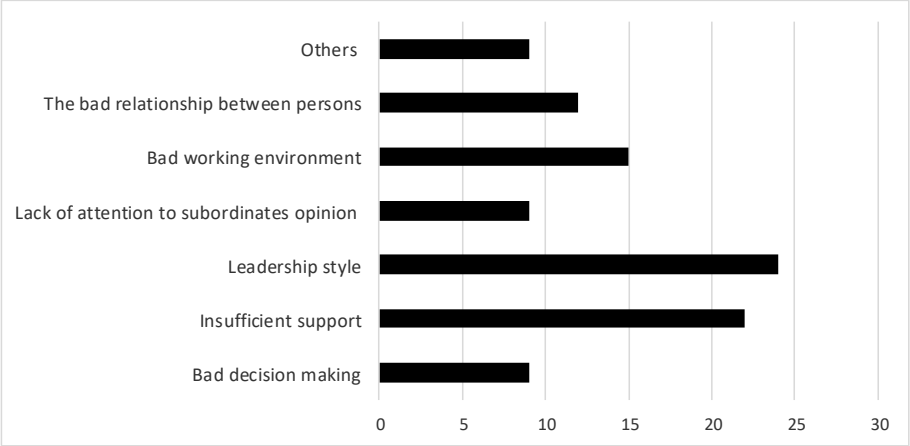
There are many factors that influence organizational performance. According to our respondents, the following factors could have a negative impact on the performance of their non-profit organization.

24% of respondents agreed that a leadership style could be a factor which has a negative impact on organizational performance, 22% of respondents said that the insufficient support is responsible for low organizational performance, while 15% of respondents picked a bad working environment as a factor acting against organizational performance (Figure 7).

Leaders have a role not only in the organizational performance of the for-profit organizations but also in non-profit organizations. Because the success and future of an organization depend on the decisions and attitudes of its leaders, it is very important to choose the best leaders to be successful in non-profit organizations.

Figure 7

Which factor has a negative impact on organizational performance? %



Source: own research.

Based on the above and on the data obtained from processing the questionnaires, we tried to position the style of the leaders of examined Hungarian non-profit organizations. In summary, we came to the conclusion that the leaders of non-profit organizations are mostly characterized by a *transformational leadership style*.

In our hypothesis, we assumed that *the relationship between transformational leadership and organizational performance has a positive correlation.*

According to the data in Table 8., there is a moderate (.449) correlation between transformational leadership style and organizational performance, and it follows that the results of the questionnaire analysis described above can be statistically proven.

Table 8

Regression analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,449[a]	,202	,199	2,183

a. Predictors: (Constant), transformational leadership style
b. Dependent Variable: organizational performance

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	435,626	1	435,626	91,399	,000[b]
	Residual	1725,372	362	4,766		
	Total	2160,997	363			

a. Dependent Variable: organizational performance
b. Predictors: (Constant), transformational leadership style

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,822	,310		9,111	,000
	transformational leadership style	,567	,059	,449	9,560	,000

a. Dependent Variable: organizational performance

Source: own research

In our regression model the transformational leadership style was the independent variable and organizational performance the dependent variable. The regression analysis (Table 8.) indicates that transformational leadership style has a considerable impact on the organizational performance of Hungarian non-profit organizations. As the Model Summary section of Table 8. shows, the R value is 0.449. The R value represents the correlation value between transformational leadership style and organizational performance. The R Square value is 0.202 and the Adjusted R Square value is 0.199. Since, the Adjusted R Square value is 0.199, it can be concluded that the independent variable accounts for nearly 20% of the variation in the dependent variable. The ANOVA section of Table 8. illustrates that the F value is 91,399. Since the F statistic is significant at 0.000 it can be said that transformational leadership style an important role in determining the organizational performance orientation of non-profit organizations. The Beta value is 0.449 at a significance level of 0.000. It indicates that transformational leadership style contributes significantly to organizational performance. The t value is 9.560 and the associated p value is 0.000. As the p value is smaller than 0.05 it can be concluded that the independent variable (transformational leadership style) reliability predicts the variation in the dependent variable (organizational performance) and the relationship between them is significant. This clearly indicates that the transformational leadership style has a positive

impact on the organizational performance undertaken by Hungarian non-profit organizations and thereby *supports our hypothesis.*

Conclusions

The results of the research show that the peculiarity of leaders of examined Hungarian non-profit organizations is that leaders use transformational leadership style, based primarily on the motivation of employees, providing them with the opportunity for a favourable socio-psychological climate, good, sincere relations between all members of the collective and favourable working conditions.

Leadership style plays a decisive role in the life of every organization. The purpose of our study was to evaluate the leadership styles used by non-profit organizations. A lot of scientific literature demonstrates that one of the most important parts of organizational performance is the leader of the organization. This conclusion is also supported by our own survey, non-profit organizations, where leaders used a transformational leadership style, had higher organizational performance due to the favourable working conditions.

We recognized during our research that the leaders of the non-profit organizations did their best to try and find the leadership style that best suited their own internal and external environment.

The transformational leaders involve their employees in their decisions, listen to their opinions, and even encourage their employees to confidently voice their views. It can be said of the leaders of the non-profit organizations surveyed that they have an appropriate professional background and experience, and are characterized by positive attributes. Praise and recognition play a decisive role among motivational tools for non-profit organizations where it is well-known that a lack of capital is common.

In our opinion, to increase organizational performance, the leaders of the examined non-profit organizations should pay more attention to creating a better workplace atmosphere, in which the creation of a favourable organizational culture can be of great help.

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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DEVELOPMENTAL PATTERNS OF VOLUNTARY PENSIONS IN CEE COUNTRIES: ANALYSIS THROUGH THE BASS DIFFUSION MODEL REFLECTING THE OBSERVATIONAL LEARNING MECHANISM

Global population ageing forces governments to transfer pension risks to individuals and employers by introducing voluntary private components into national pension systems. Diffusion theories in combination with behavioural economics can help to understand the nature of developmental patterns of voluntary pensions. This paper modifies the Bass Diffusion Model by introducing hypotheses regarding the information cascade when joining a voluntary pension schemes, a variance of participants' growth and its moderation effect on the information cascade. We trace the diffusion of voluntary pensions in four CEE countries (Bulgaria, the Czech Republic, Romania, and Ukraine), and show that the modified model delivers better overall performance than previous models both in terms of model fit and *understanding this process. In addition, we demonstrate that the modified model allows us to correctly describe the wave-like nature of the evolution of voluntary pension provision caused by pension transformations.*
JEL: C52; G23; P36

1. Introduction

The global demographic trend – population ageing – affects the financial health of national pension systems and increases the burden on national economies. But this is probably the greatest challenge for the ageing countries of Central and Eastern Europe (CEE), in which the negative impact of the demographic trend is intensified by the non-completed transformational processes, both in institutional and in mental terms. In the pre-reform period, a generous state pension system operated in the CEE countries, called pay-as-you-go (PAYG), in which the current pension welfare of the elderly is financed by the contribution from the current working population. However, in an ageing society, PAYG systems become burdensome for the state, while not providing decent pensions to citizens. Therefore, the World Bank has recommended the introduction of multi-pillar pension

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systems that include voluntary professional and personal funded components. However, the evolution of such systems occurs in different ways.

In this study, using diffusion models, we will explore the evolution of voluntary pension provision in four CEE countries, namely: in Bulgaria, the Czech Republic, Romania, and Ukraine. We chose these countries to ensure, on the one hand, comparability of pension models, and on the other, certain diversity in income, innovative development and demographic ageing. The old-age dependency ratio, calculated as the ratio of the number of elderly people (aged 65 and over) to the number of people of working age (aged 15-64) according to the World Bank (2019) is the highest in Bulgaria (32.02%) and the Czech Republic (29%), followed by Romania (26.69%) and Ukraine (24.19%). However, in terms of the sustainability of pension systems, Bulgaria, the Czech Republic and Romania are included in the cluster of lower-spending transition countries; in these countries, life expectancy at retirement is 14-19 years, and pension spending averaging around 35% of GDP per capita (Schwarz and Arias, 2014). At the same time, Ukraine is included in the cluster of high-spending transformation countries (life expectancy at retirement is 14-17 years old, and pension spending is at least 60% of GDP per capita). As for the financial capabilities of the population in terms of private pension savings, according to the World Bank Income Group Classification, selected CEE countries are in different income groups, but the Global Innovation Index does not differ significantly, namely: the Czech Republic (Score is 48.75) is high-income economies, Bulgaria (42.65) and Romania (37.59) are upper-middle-income economies, and Ukraine (38.52) is lower-middle-income economy (Cornell University et al., 2018).

The question arises: do diffusion processes of voluntary pensions in these countries differ? We assume that diffusion theories in combination with behavioural economics help to understand the nature of the specific patterns of development of voluntary pension provision. The purpose of this study is to develop the Bass Diffusion Model (BDM) for voluntary private pension provision that reflects the observational learning mechanism. We assume that potential participants in voluntary pension funds make decisions based on empirical observations of the behaviour of previous participants. We introduce three hypotheses: (1) there is an information cascade when joining voluntary pension scheme, (2) the variance of the flow of information on participants' growth is the inverse measure of the perception of pension innovations, and (3) the variance is a moderator of the relationship between the previous participants' growth and imitators' growth. Empirical results show that the Modified Bass Diffusion Model (MBDM) delivers better overall performance than previous models both in terms of model fit and understanding this process. This study contributes both to diffusion theory and to pension research, empirically analyzing the developmental patterns of voluntary private pension provision for the entire period of its existence in four CEE countries using the original and modified Bass Diffusion Models.

The remainder of the paper is structured as follows. Section 2 presents the institutional background of the pension provision in selected countries and a literature review. Section 3 shows the special cases of the BDM for voluntary private pension provision and presents modified hypotheses and a model. Section 4 discusses the results of modelling and hypotheses testing, and then carries out a parametric analysis of diffusion patterns of

voluntary pensions in selected CEE countries. Finally, the conclusion and future research perspectives are given in section 5.

2. Institutional background and literature review

2.1. Background for the voluntary private pension systems in selected CEE countries

At present, pension systems in the post-communist countries of CEE are multi-pillar and are based on diversifying the principles of administration and financing of the pensions – publicly and privately managed, redistributive and funded, defined benefit (DB) and defined contribution (DC), personal and occupational with mandatory and voluntary participation. Pillar I in all countries studied (Bulgaria, the Czech Republic, Romania, and Ukraine) is a mandatory public pension insurance system (redistributive DB pension scheme); in fact, it is a slightly reformed PAYG system. Pillar II in Bulgaria and Romania is a privately managed mandatory funded DC pension system based on individual retirement savings accounts. In Ukraine, a similar Pillar II is legally established, but not yet introduced. In the Czech Republic, formally, Pillar II is absent, but there is a third voluntary pillar with state contributions and tax incentives, i.e., with signs of Pillar II according to the World Bank classification (Holzmann and Hinz, 2005). In all countries considered, Pillar III is a voluntary private pension system, which is represented by fully-funded DC schemes with individual accounts, but the institutional framework differs – professional and/or personal voluntary private plans. Furthermore, in all countries, governments provide tax incentives to encourage participation in voluntary pension provision.

In Bulgaria, Pillar III is voluntary personal schemes. Voluntary private pension funds (VPF) were introduced in 1995. Participation in VPFs is open to all those aged 16 and over; contributions are paid by the members themselves or by their employers and are not taxable up to a certain limit. As of 31 Math 2019, personal voluntary pillar encompasses 9 VPFs, offering pensions to 630 514 members; Allianz Bulgaria (34.11%) and Doverie (22.96%) occupy the largest market shares in terms of membership (Financial Supervision Commission [FSC], 2019). In addition, on January 1, 2007, voluntary occupational Pillar IV was introduced, in which the collective bargaining agreement or the collective employment contract determines the coverage.

In the Czech Republic, voluntary Pillar III was established as a supplementary pension insurance system in 1994. The system had generous government support (state contributions, tax deductibles, exemption of employers' contributions from social insurance premiums) and, as a result, in 2010, operating costs accounted for 1.4% of total assets, higher than in Bulgaria (1.2%), Hungary (1.0%), Slovenia (.9), Slovak Republic (.5%), Poland (.4%), but less than in Ukraine (5.9%) (OECD, 2011). In 2013, the supplementary pension system was reformed. Pension funds had to transform into "pension companies", the existing supplementary pension insurance plans were closed for new participants and renamed as "transformed funds", each managed by a pension company; new clients may enter one of the new "participation funds" managed by a pension company, and participants in transformed funds may switch to new participation funds (Vostatek, 2016). In 2019, 8 pension companies managed Pillar III funds. But, despite the reform, substantial state

support has been preserved, so Pillar III can be characterized as a nudging system, and in fact, it is the Pillar II according to the World Bank classification, which explains a very large number of participants in the system. The total number of participants in the Pillar III in the first quarter of 2019 reached 4 442 424 persons (of which 3 425 736 in transformed funds and 1 016 688 in participation funds) (Association of Pension Companies CR [APCCR], 2019).

In Romania, Pillar III is the voluntary occupational pension system introduced in 2006. Currently, 10 voluntary pension funds are active; the total number of participants is 469 532 persons; NN Optim (36.51%) and BCR Plus (28.73%) occupy the largest market shares in terms of membership (Financial Supervisory Authority [FSA], 2019). The Romanian third pillar allows both the employee and employer to contribute and each of them is entitled to a deduction of 200 Euros per fiscal year.

In Ukraine, Pillar III is the voluntary occupational-personal pension system introduced in 2004. It is based on three types of voluntary non-state pension funds (NPFs) – open, corporate and professional. Participants in an open fund may be any individuals, regardless of location and nature of their activities, and citizenship; participants of the corporate fund are individuals who have been in labour relations with employers-founders or payers of the fund; participants in the professional fund are individuals linked by their professional activity (occupation) defined in the fund's charter. As of March 31 2019, 61 NPFs are registered, and the total number of participants is 858 400 persons (National Commission for Regulation of Financial Services Markets [NCRFSM], 2019). The structure of the pension fund market in terms of membership is as follows: 54.58%, 43.19% and 2.23%, respectively, for open, professional and corporate NPFs. At the same time, the professional NPF Magistral (38.03%) (Administrator of the Pension Fund "Center of Personified Accounting" [APFCPA], 2019) and the open NPF Europe (15.59%) (All-Ukrainian Pension Fund Administrator [APFA] 2019) occupy the largest market shares. As in other countries, in Ukraine tax relief is given to participants and payers of NPFs. In particular, pension contributions paid by an employer to non-state pension coverage of its employees are related to the company's expenses in full, and are not included in the basis for calculating the single contribution to compulsory state social insurance; for an individual, the amount of his personal pension contributions is not included in the calculation of the total monthly (annual) taxable income.

Summing up, we note that the participation rate in voluntary pension Pillar III (the percentage of the population over 15 years old) is 10.4% in Bulgaria, 49.5% in the Czech Republic, 2.8% in Romania and 2.3% in Ukraine. Dependence on the degree of state support is obvious, given that "the overall value of state subsidies for Czech private pension plans is the highest in the world" (Vostatek, 2016). However, such a government policy distorts the essence of voluntary private pensions. The questions arise: Why does voluntary pension provision develop only with strong government funding? What hinders the diffusion of voluntary pension schemes?

2.2. Literature review

Voluntary pension provision is an innovative product in the pension markets of post-communist countries, therefore, the innovation diffusion theories are applicable and appropriate for describe and predict their diffusion. Three diffusion theories that differ in the underlying causal mechanism of diffusion can be distinguished in contemporary studies: (i) classic diffusion theory (contagion mechanism) (Rogers, 1962/1983; Bass, 1969), (ii) institutional diffusion theory (conformity mechanism) (e.g., Tingling and Parent, 2002), and (iii) cognitive-institutional diffusion theory (social or observational learning mechanism) (e.g., Strang and Soule, 1998). In reality, however, diffusion mechanisms often act simultaneously and complement each other throughout the entire diffusion process, which is manifested in the diffusion of pension innovations. Contagion implies the commonly observed S-shaped cumulative adoption curve (Strang and Soule, 1998) that established by analyzing the spread of the first retirement systems worldwide (Orenshtein, 2003), voluntary pensions in Ukraine and Romania (Yakymova 2013; 2018).

Conformity or social influence is determined by (i) imitation of peers, (ii) context or pressure (coercion of influential institutions), and (iii) compliance with accepted norms. Brooks (2005; 2007) identified institutional mechanisms in the cross-national diffusion of pension privatization (Pillar II), namely, the imitation of peers, the impact of the demographic, political, and economic context. Brooks (2005) stresses that the likelihood of adopting pension privatization should be higher in nations where demographic pressures are high, and in nations where macroeconomic incentives are strong (e.g., where domestic capital markets are underdeveloped). At the same time, empirical evidence of the significant role of financial coercion by the Word Bank was not found (Brooks, 2007). In addition, researchers point to the impact of the pension context – the generosity of public pension systems. For instance, Marcinkiewicz (2019) found that in countries where mandatory pension benefits are expected to be lower, and in countries where a flatter pension benefit formula is adopted in the public system, voluntary pensions are better developed. However, our evidence above regarding voluntary private provision coverage in selected CEE countries does not confirm these findings. In Ukraine, demographic pressure is high, domestic capital markets are underdeveloped, mandatory pension payments are expected to be the least, but coverage is the least. Thus, we see that social influence, like a contagion, does not provide a clear reason why people do not accept innovation, while others have already accepted it.

From an economic standpoint, the social or observational learning is the most plausible diffusion mechanism. Social learning mechanism occurs when prospective adopters obtain necessary knowledge and information from collective rationales (Bui, 2015), when the evidence is generated by the outcomes among prior adopters (Young, 2009). At the same time, the learning literature distinguishes between social learning (information is communicated directly) and observational learning (potential adopters simply observe whether or not others are adopting, and thus interpret such adoption as a signal of quality) (Gilchrist and Sands, 2016). However, with incomplete information and limited ability to process it, people make decisions using simple mental shortcuts – heuristics "which sometimes yield reasonable judgments and sometimes lead to severe and systematic errors" (Tversky and Kahneman, 1974). When analyzing the behaviour of individuals in the field

of voluntary pensions, heuristics and cognitive biases that arise at the stage of (i) retirement planning, (ii) joining a voluntary pension fund, and (iii) retirement savings and investing can be identified.

Accumulating sufficient retirement income requires timely retirement planning. However, people postpone retirement planning due to the perceived length and complexity of the process (Ontario Securities Commission [OSC], 2018), low expectations of success (Brucker and Leppel, 2013) especially when considering the generally unpleasant thought of ageing and possible mortality (Howard and Yazdipour 2014). In addition to barriers of "overload" and emotional burdens, barriers to retirement savings are "bounded self-control" (Mitchell and Stephen, 2003) and procrastination caused by hyperbolic discounting (Knoll, 2010). The reason is that the primary benefits of retirement planning accrue in the future, but people discount long-term outcomes compared to short-term outcomes (OSC, 2018); that is, retirement savings involves a trade-off between more money in one's paycheck now and a more comfortable life in the future (Knoll 2010). It should be noted that previous studies have also revealed other factors affecting retirement planning: current income and wealth, the expected primary source of retirement income, gender, age. Brucker and Leppel (2013) found that women, people with low net wealth, and those who expect to rely primarily on social security as their retirement income, are least prone to retirement planning. Hedesstrom et al. (2007) revealed that participation in choosing a fund increases with the amount invested, but decreases with age.

With regard to the stage of joining the pension fund, empirical studies (Benartzi, Thaler, 2007; DiCenzo, 2007; Hedesstrom et al., 2007; Rudolph, 2016; Knoll, 2010; Mitchell, Utkus, 2003; OSC, 2018; Romanos, 2013; VanDerhei, 2010) indicate a possible default bias and framing effect – people, as a rule, are tied to the default parameters and do not make any changes. Therefore, occupational voluntary pension funds use automatic registration as a nudge mechanism, which has two effects: participants join earlier and eventually more participants join (Benartzi, Thaler, 2007). However, in open voluntary pension funds, this option cannot be applied. At the same time, peers may influence the decisions of individuals to save for retirement (DiCenzo, 2007). The effect of peers is explained by the fact that individuals, in essence, want to conform to the behaviour of others. Conformity can be achieved if early individuals explain the advantages of alternatives to later ones (Rogers, 1962/1983). Bikhchandani et al. (1992) offer "an alternative explanation for the influence of peers: that individuals, especially those with little information or experience, obtain information from the decisions of others". Sequential observation of the decisions of previous people can start the information cascade both up and down. Bikhchandani et al. (1992) show that cascades can explain not only conformity, but also the rapid spread of new behaviour. In this study, we will try to verify the validity of these findings for behaviour in the field of voluntary pensions, using the historical data of selected CEE countries.

Having joined the pension fund, individuals continue to use convenient rules of thumb, which can lead to negative results that will be communicated to their "peers ". Empirical studies show (e.g., Mitchell, Utkus, 2003) that the default bias and framing affect both the saving choices and the investment decisions of fund participants. Participants usually agree with the default options and make the easiest, rather than the best, decision. The researchers

explain this behaviour by other anomalies, for example, saving heuristics (e.g., "saving the max"), naive diversification strategies (e.g., "1/n rule"), loss aversion, mental accounting, anchoring, inertia and procrastination (Benartzi, Thaler, 2007; Hedesstrom et al., 2007; Mitchell, Utkus, 2003; Romanos, 2013).

Thus, people apply simple rules of thumb at all stages of their "retirement trajectory"; and one of the most important reasons for their use is often called the financial illiteracy of the population. But, for instance, the findings by Romanos (2013) suggest that financial literacy cannot significantly mitigate the effects of framing. Therefore, behaviourists advise stakeholders "to accept the behaviour of participants and think more about changing their own, using the automatic functions of the plan" (DiCenzo, 2007).

Behavioural heuristics also manifest themselves in the cross-country diffusion of pension reforms. Weyland (2005; 2007) identified three heuristics that explain the nature of diffusion of the so-called Chilean pension model in Latin America countries: (i) the availability heuristic explains strong neighbourhood effects in diffusion innovation (geographical clustering); (ii) the representativeness heuristic affects the assessment of innovation, giving rise to the S-shaped temporal diffusion pattern; and (iii) the heuristic of anchoring explains the spread of commonality amid diversity (Weyland, 2005). At the same time, however, cultural, political or historical similarity can overcome the effects of geographic proximity (Weyland, 2007). Our previous study (Yakymova, 2018) found that in some cases classical diffusion models are unable to describe the diffusion of voluntary pension provision. The theory of observational learning, and especially informational cascades, can help increase the explanatory abilities of diffusion models.

In this study, we use BDM as the base model because, firstly, it allows us to describe the diffusion of private pension, which is essentially a new durable product in CEE countries. Secondly, the main causal mechanism of diffusion of voluntary pensions is the imitation (or contagion) mechanism that underlies BDM. Thirdly, the contagion mechanism explains the S-shaped cumulative curve that is observed in the diffusion of voluntary pensions, as we will see below. Fourth, the estimated BDM parameters help explain the nature of the diffuse process to policymakers. Finally, the BDM specification makes it possible to incorporate predictors that reflect behavioural heuristics.

3. Methodology

3.1. Special cases of the Bass Diffusion Model for the diffusion of voluntary pension provision

The Bass Diffusion Model for voluntary private pension provision (Yakymova, 2018) is based on the following assumptions: (i) pension innovation (participation in Pillar III or in a voluntary pension fund) is available in the pension market with m persons, in other words, m is the size of the pension market; (ii) the diffusion process is binary, that is, individual either joins Pillar III or does not join at time t; (iii) eventually, all m potential participants will join Pillar III; (iv) no-repeat joining or replacement; (v) the marketing strategies supporting the voluntary pension provision are not explicitly included. Moreover, the

increase in the number of participants in Pillar III is due to two effects: (i) the effect of advertising (mass-media); (ii) the effect of interpersonal communication (word-of-mouth, WoM). In this sense, the pension society with *m* persons can be divided into two categories of individuals: (i) innovators themselves learn and "try" voluntary pension provision; (ii) imitators learn from the first and join Pillar III. According to (Bass, 1969), the key difference between an innovator and an imitator is the influence of the participants, namely: innovators are not influenced in the timing of their joining by the number of people who have already joined Pillar III, while imitators are influenced by the number of actual participants. Then, the original BDM in the form of a decomposition of the number of participants joining Pillar III at time t to innovators and imitators can be represented as follows:

$$n(t) = In(t) + Im(t) = p[m - N(t)] + q\frac{N(t)}{m}\,[m - N(t)], \tag{1}$$

where $n(t)$ is a non-cumulative number of participants (participants' growth) at time t, $N(t)$ is a cumulative number of participants at time t, m is the size of the pension market, p is the coefficient of innovation (coefficient of external influence), q is the coefficient of imitation (coefficient of internal influence), $In(t)$ and $Im(t)$ are non-cumulative number of innovators and imitators at time t.

The nature of diffusion depends on the values of the parameters p and q, as well as the relationships between them. In estimating the parameters m, p, and q from discrete time series data is used the discrete analogue of the BDM (1)

$$n_t = \beta_0 + \beta_1 N_{t-1} + \beta_2 N_{t-1}^2 + \varepsilon_t\,, \tag{2}$$

The OLS method is used to estimating the unknown parameters β_0, β_1, and β_2, by transforming a nonlinear form into a linear one; and the BDM parameters are calculated by the following formulas:

$$\hat{m} = \frac{-\hat{\beta}_1 \pm \sqrt{\hat{\beta}_1^2 - 4\hat{\beta}_0\hat{\beta}_2}}{2\hat{\beta}_2},\ \hat{p} = \frac{\hat{\beta}_0}{\hat{m}},\ \hat{q} = -\hat{m}\hat{\beta}_2\,. \tag{3}$$

It should be noted here that the OLS procedure has three shortcomings (Mahajan et al., 1990): (i) due to the likely multicollinearity between the regressors, OLS-estimates of the coefficients of the model (2) may be unstable, and their standard errors may be wildly inflated; (ii) the procedure does not directly provide standard errors for the estimated parameters p, q, and m, i.e., their statistical significance cannot be estimated; (iii) there is a time-interval bias because discrete time series data are used to evaluate a continuous model. Other methods can be used, but we must consider the purpose of the BDM. As emphasized by Mahajan et al. (1990), the estimation of BDM parameters is primarily of historical interest; by the time sufficient observations have developed for reliable estimation, it is too late to use the estimates for forecasting purposes. The estimates can be used to test models

and compare new products. Considered in such a context, the methods often yield estimates that do not differ greatly.

In the original BDM, the estimates p and q are positive (for simplicity, we omit the symbols of the estimates ^ in notation); otherwise, it was assumed that the model does not make sense. However, more recent studies indicate that non-positive parameters are plausible and explain the nature of this diffusion. Rafi and Akthar (2011) note that there are two special cases of the BDM: the first case occurs when $q = 0$, when the model reduces to the Exponential distribution; and the second case reduces to the logistic distribution, when $p = 0$. In other words, if ($p > 0$, $q = 0$), this is a pure innovation scenario; if ($p = 0$, $q > 0$), this is a pure imitation scenario.

In addition, we received negative values of the imitation coefficient q, when modelling the diffusion of voluntary pension provision (Yakymova, 2018). We found that if ($p > 0$, $q < 0$), this is a negative diffusion, and the diffusion curve follows a modified logistic curve concave down. We interpreted the negative diffusion of voluntary pensions by analogy with diffusion in physical systems. In general, a negative diffusion coefficient means a process of "concentration" as opposed to diffusion.

If ($p < 0$, $q > 0$), in general, this means that there is a barrier to initial adoption and triggering diffusion. However, if $q > |p|$, the barriers to adoption can be overcome by seeding (Orbach, 2016). The nature of the diffusion of voluntary pensions for a negative innovation coefficient will be empirically established in the next section.

The fraction (q/p) determines the shape of the diffusion curve. If $(q/p) > 1$, the non-cumulative number of participants $n(t)$ peaks at time $T^* > 0$, which is the point of inflexion of the S-shaped curve of a cumulative number of participants $N(t)$. If $(q/p) \leq 1$, $n(t)$ decreases monotonically with time t and $T^* < 0$ (negative peak). The sum $(p + q)$ determines the rate of adoption (or scale of diffusion). According to Rogers (1962/1983), "rate of adoption is a numerical indicant of the steepness of the adoption curve for an innovation". The larger the sum $(p + q)$, the steeper the diffusion curve and the larger the diffusion scale.

Thus, the following conclusions can be formulated regarding the adoption of pension innovation by the society. The larger the sum $(p + q)$, the greater the diffusion rate of voluntary pension provision in society. If $q > p$, the pension innovation is successful; the influence of WoM is greater than the external influences (media). If $q \leq p$, the pension innovation is unsuccessful; the influence of WoM is less than the external influences.

Summing up, it is necessary to distinguish four special cases that can be encountered in the practical use of the BDM: (i) the negative square root error when estimating m by the formula (3); (ii) the negative peak ($q \leq p$); (iii) the negative coefficient of imitation ($q < 0$); and (iv) the negative coefficient of innovation ($p < 0$). When studying the diffusion of voluntary pensions in Romania and Ukraine (Yakymova, 2018), we found the first three cases, and this led us to the need to revise the BDM hypotheses.

3.2. A modification of Bass's hypothesis for predicting diffusion of voluntary pension provision

When analyzing the spread of voluntary pensions in CEE countries, an association with two manifestations of imitative behaviour – the informational cascade and herd behaviour – intuitively arises. These phenomena are considered pathological, because erroneous outcomes can occur, despite the individual rationality (Celen, Kariv, 2004). However, in the case of pension innovations that are long-term in nature, they actually become the norm of collective behavior. "An informational cascade occurs when it is optimal for an individual, having observed the actions of those ahead of him, to follow the behaviour of the preceding individual without regard to his own information" (Bikhchandani et al., 1992).

The term "herd behaviour" is often used as a synonym, but Smith and Sorensen (2000), and Celen and Kariv (2004) indicate to the following difference: an informational cascade occurs "when an infinite sequence of individuals ignore their private information when making a decision, whereas herd behaviour occurs when an infinite sequence of individuals make an identical decision, not necessarily ignoring their private information". Thus, an informational cascade implies a herd, but a herd is not necessarily the result of an informational cascade (Celen, Kariv, 2004).

The collective behaviour of individuals in the field of voluntary pensions probably has the nature of an informational cascade, as the individual (imitator) considers it optimal to follow the behaviour of his predecessors, ignoring his private signal – the expediency of individual pension savings. We assume that the acts of joining and leaving voluntary pension funds are observable. Thus, innovators, as before, themselves learn and "try" voluntary pension provision, and imitators are exposed to an informational cascade, i.e., follow the behaviour of the preceding individual. In other words, the diffusion of voluntary pension provision is an autoregressive process. In this study, we assume a first-order autoregressive process – the AR (1) process. It is important to note that this approach to identifying the information cascade was used by Walden and Browne (2008) to explain the formation of the Internet bubble. This line of argument suggests that: H_1: The imitators' growth at time t is a function of the participants' growth at time t-1: $Im_t = f(n_{t-1})$.

Furthermore, imitators observe/study the flow of information on the growth of participants in voluntary pension provision; and the more controversial this information is, the less probability it is that they will make a positive decision on joining a voluntary pension fund. In other words, the variance of the flow of information on participants' growth is the inverse measure of the perception of pension innovations. This line of reasoning suggests that: H_2: The imitators' growth at time t is a function of the variance of the participants' growth in the previous period: $Im_t = f(Variance_{t-1})$. Note that in this study, we use the variance (σ^2) as a measure of variation. Moreover, we assume that a potential participant can monitor either the entire period of the existence of Pillar III (or voluntary pension fund), or only a certain last period, for example, a year. In the first case, we use the total variance of the time series up to the moment t-1, and in the second case, it is the 12-month rolling variance.

Finally, it is obvious that the influence of the previous participants' growth on the current imitators' growth varies depending on the variance, i.e., there is a so-called interaction

effect, where the variance is a moderating factor. Therefore, the third hypothesis is H_3: Variance is a moderator of the relationship between the participants' growth at time *t*-1 and the imitators' growth at time *t*: $Im_t = f(Interaction_{t-1})$. In what follows, we use the terms "interaction" and "moderation" synonymously. In our case, there is an interaction between the participants' growth in the previous period and variance, or variance moderates the relationship between the previous participants' growth and imitators' growth. Thus, summing up the hypotheses, the imitators' growth at time *t* is given by $Im_t = f(n_{t-1}, Variance_{t-1}, Interaction_{t-1})$.

3.3. Moderation effect test

Moderation occurs when the relationship between *X* and *Y* depends on *Z* (Jaccard et al., 1990), that is a moderator (*Z*) is a "variable that affects the direction and/or strength of the relationship between an independent or predictor variable and a dependent or criterion variable" (Baron and Kenny, 1986). In this study, the moderation effect is tested using hierarchical "moderated multiple regressions" (MMR) (Saunders, 1956) as follows. The regression equation used to assess the predictive effect of two independent variables (n_{t-1} and $Variance_{t-1}$) on participants' growth n_t is:

$$n_t = b_0 + b_1 n_{t-1} + b_2 \sigma^2_{t-1} + \varepsilon_{1t}. \quad (4)$$

To incorporate interaction in regression (4), we add the explanatory variable $Interacttion_{t-1} = n_{t-1}\sigma^2_{t-1}$

$$n_t = b_0 + b_1 n_{t-1} + b_2 \sigma^2_{t-1} + b_3 n_{t-1}\sigma^2_{t-1} + \varepsilon_{2t}. \quad (5)$$

Note that all predictors are centred prior to regressions estimation to reduce multicollinearity among predictor variables. Further, in accordance with Carte and Russell (2003), to identify the moderation effect, we test the null hypothesis H_0: $\Delta R^2 = R^2_{mult} - R^2_{add} = 0$ against the alternative hypothesis H_A: $\Delta R^2 \neq 0$, where R^2_{add} and R^2_{mult} are coefficients of determination for additive regression (4) and multiplicative regression (5). To do this, we use *F*-statistic calculated by the formula

$$F_{(df_{mult} - df_{add}, N - df_{mult} - 1)} = \frac{\Delta R^2}{df_{mult} - df_{add}} \cdot \frac{N - df_{mult} - 1}{1 - R^2_{mult}}, \quad (6)$$

where df_{add} and df_{mult} are degrees of freedom for additive regression (4) and multiplicative regression (5), *N* is a sample size.

In the general case, if the calculated *F*-value is greater than *F*-critical value, the null hypothesis is rejected and it is concluded that either $Variance_{t-1}$ moderates the $n_{t-i} \rightarrow n_t$ relationship or n_{t-i} moderates the $Variance_{t-1} \rightarrow n_t$ relationship. But we theoretically exclude

the existence of the so-called reverse interaction effect (Andersson et al., 2014), in which the independent variable n_{t-i} is actually affecting the relationship between the moderator $Variance_{t-1}$ and dependent variable n_t. In conclusion, it is important to emphasize that using b_3 instead of ΔR^2 as an indicator of moderator effect size is an error (Carte and Russell, 2003).

3.4. Modified Bass Diffusion Model

According to the discrete analogue of BDM, the participants' growth at time t is equal to the sum $n_t = In_t + Im_t$, where $In_t = p(m - N_{t-1})$, $Im_t = q\frac{N_{t-1}}{m}(m - N_{t-1})$, and p, q, m parameters are constants. But in reality, the coefficient of imitation q is not constant, and by virtue of the accepted hypotheses, the imitators' growth at time t can be expressed as a linear regression:

$$Im_t = b_1 n_{t-1} + b_2 \sigma_{t-1}^2 + b_3 n_{t-1}\sigma_{t-1}^2 + \varepsilon_t . \quad (7)$$

Therefore, the number of individuals who join Pillar III at time t is defined as:

$$n_t = \beta_0 + \beta_1 N_{t-1} + \beta_2 n_{t-1} + \beta_3 \sigma_{t-1}^2 + \beta_4 n_{t-1}\sigma_{t-1}^2 + \varepsilon_t . \quad (8)$$

Thus, the regression equation (8) is the Modified Bass Diffusion Model (MBDM), which takes into account the effect of the informational cascade, the variance of the flow of participants and the effect of moderation. The OLS method is used to estimating the unknown parameters β_j, $j = 1, 2, 3, 4$, and the MBDM parameters are calculated by the following formulas:

$$\hat{m} = -\frac{\hat{\beta}_0}{\hat{\beta}_1},\ \hat{p} = -\hat{\beta}_1,\ \hat{b}_1 = \hat{\beta}_2,\ \hat{b}_2 = \hat{\beta}_3,\ \hat{b}_3 = \hat{\beta}_4,\ \hat{q}_t = \frac{\hat{Im}_t \cdot \hat{m}}{N_{t-1}(\hat{m} - N_{t-1})}. \quad (9)$$

4. Results and discussion

4.1. Data

Data on Pillar III membership have been collected from national sources. Official pension statistics provide monthly data for Bulgaria (FSC, 2019) and Romania (FSA, 2019), and quarterly data for the Czech Republic (APCCR, 2019) and Ukraine (NCRFSM, 2019). We use data for Bulgaria for the period from December 2002 to September 2018, the Czech Republic – from Q4 1994 to Q3 2018, Romania – from September 2017 to November 2018, and Ukraine – from Q1 2005 to Q3 2018. We also use data from 6 out of 9 voluntary pension funds in Bulgaria, 6 out of 10 funds in Romania, 6 out of 8 funds in the Czech Republic; other funds have a short history due to late establishment, closure or merger, so their use would violate the comparability of model results. As for Ukraine, we analyzed the

membership in 61 non-NPFs from the date of their establishment, but we present the simulation results for only 6 funds (monthly statistics) (APFCPA, 2019; APFA, 2019). This choice is due to a long history of funds, the availability of comparable information, the diffusion of participants, etc. For example, the corporate non-state pension fund Poshtovyk was founded by the Ukrainian State Enterprise of Posts Ukrposhta in 2008, and by 2011 the number of participants reached 20, but in 2017 the fund was reduced to 13 people, and in April 2019 there were 3 people remained (APFCPA, 2019). It is obvious that modelling such a process is meaningless, and similar funds are subject to consolidation (merger) or rethinking of their strategy; therefore, we did not use such data series. Next, we use diffusion models to explain these processes both at the macro-level (by countries) and at the micro-level (by pension funds).

4.2. Empirical results and discussion

4.2.1. Discussion of simulation and hypothesis testing results

First of all, in order to confirm the need to modify the Bass model when predicting the diffusion of voluntary pension provision, we have tested the hypothesis about the moderation effect of the variation of participants on the relationship between the previous and current participants' growth. We have tested the moderation effect of the total variance ($\sigma^2(n)$), as well as the rolling variance with a 12-month windows ($\sigma^2(12)$) for Bulgaria and Romania and with a 4-quarter windows ($\sigma^2(4)$) for the Czech Republic and Ukraine. Table 1 shows the calculated F-statistics values by (9) and the significance of F. As we can see, the null hypothesis of the absence of moderation was categorically rejected for all data, with the exception of the Bulgarian VPF CCB-Sila, the Ukrainian Pillar III, and the NPF Magistral. For these data, there is no convincing evidence of the interaction (p-value > .1 for the effect test), so a model without interaction should be used. As for CCB-Sila, the unsatisfactory result can be explained by a technical reason: in January 2010 there was a merger with Lukoil Garant-Bulgaria-VPF, which ceased its activity, so we used the total number of participants over the entire simulation period. For all other data, the interaction model adopted for analysis is appropriate and valid.

The test results also show some significant differences between countries in the moderation effect of the variance of participants' growth for the entire period or only for the last year. Bulgaria and the Czech Republic show a significant moderation effect of the variance of the last year, despite the differences in the aggregation of data (monthly and quarterly, respectively); whereas in Romania (monthly aggregation) and in Ukraine (quarterly aggregation) such homogeneity is absent.

Table 1

Testing moderation effects of total and rolling variance (*F*-statistics)

Pillar III, voluntary pension funds	Total variance	Rolling variance	Pillar III, voluntary pension funds	Total variance	Rolling variance
Bulgaria			The Czech Republic		
Pillar III, total	1.15	12.97****	Pillar III, total	.19	9.91***
Allianz Bulgaria	1.85	19.52****	Allianz PS	.23	13.28****
CCB-Sila	1.40	.12	CS PS	5.64**	19.17****
Doverie	29.41****	25.96****	CSOB PS	32.64	43.91****
DSK-Rodina	15.94****	12.05****	KB PS	18.18****	19.98****
NN VPF	3.16*	4.11**	NN PS	4.86**	40.78****
Saglasie	158.14****	131.50****	PS CP	1.17	5.88**
Romania			Ukraine		
Pillar III, total	13.92****	.08	Pillar III, total	0.50	0.002
AZT Moderato	32.73****	.60	Europe	15.04****	19.57****
AZT Vivance	.003	11.59****	Magistral	0.99	.25
BCR Plus	1.97	42.77****	OTP Pension	3.50*	2.20
NN Activ	15.26****	.14	Pension Capital	6.06**	.0006
NN Optim	2.36*	.05	Social Standard	6.27**	11.63****
Pensia Mea	.17	15.28****	Vzaemodopomoga	9.93***	18.34****

** p < .10, **p < .05, ***p < .01, ****p < .001*

Table 2 shows the values of the correlation matrix (R) determinant and the variance inflation factors (VIF) for testing multicollinearity among MBDM predictors, taking into account the findings of Table 1. VIF is computed as $VIF_j = \left(1 - R_j^2\right)^{-1}$ for each of the j – 1 independent variable of the MBDM. *VIF*-values greater than 10 indicate a problematic amount of multicollinearity only for AZT Vivance and Europe; for the same funds, the values of det *R* tend to zero (.04 and .06, respectively). This result indicates the absence of systemic multicollinearity among the independent variables of the model (8). In addition, Kutner et al. (2005, p. 283) note "the fact that some or all predictor variables are correlated among themselves does not, in general, inhibit our ability to obtain a good fit nor does it tend to affect inferences about mean responses or predictions of new observations". Based on this, we will not try to reduce the detected multicollinearity.

The next step is to estimate (OLS) the parameters of the modified Bass diffusion models to test the hypotheses put forward and the performance of these models. In estimating the parameters, the type of variance was used, which showed convincing evidence of the interaction. In addition, we estimated the parameters of the Bass models in order to compare the explanatory and predictive capabilities of BDMs and MBDMs for all funds and countries. Table 3 and Table 4 show the results of the estimation.

Table 2

Testing multicollinearity among independent variables, autocorrelation and heteroskedasticity in the MBDM residuals

Country	Pillar III / Fund	Multicollinearity tests					Autocorrelation tests			White test for hetero-skedasticity, *F*-statistic
		det R	*VIF*				*DW*[a]-statistic	*h*-statistic	*LM•*-statistic	
			N_{t-1}	n_{t-1}	Var_{t-1}	Int_{t-1}				
Bulgaria	Pillar III	.42	1.38	1.66	1.30	1.68	1.31	n.a.[b]	.38*	2.74*
	Allianz Bulgaria	.39	1.05	1.51	1.72	2.10	.57	-1.71*		6.25***
	Doverie	.28	1.26	2.11	1.62	2.32	1.54	n.a.	8.33***	11.78
	DSK-Rodina	.34	1.91	2.15	1.58	2.05	1.65(.23*)[c]	n.a.	13.84	1.42*
	NN VPF	.23	1.16	4.10	1.06	3.93	1.75**	n.a.	.68*	0.49*
	Saglasie	.12	1.04	7.23	1.15	7.19	1.25	n.a.	5.29**	46.90
The Czech Republic	Pillar III	.25	2.17	1.53	2.49	1.72	1.70*	n.a.	12.96	2.06*
	Allianz PS	.11	1.22	7.03	1.41	6.59	1.54**	n.a.	2.05*	3.91**
	CS PS	.44	1.26	1.93	1.19	1.84	1.66*	n.a.	.53*	.62*
	CSOB PS	.75	1.13	1.25	1.07	1.20	.97	.39*		.28*
	KB PS	.42	1.29	2.21	1.12	2.03	1.75*	n	.41*	1.24*
	NN PS	.69	1.13	1.30	1.11	1.26	.90	-.86*		6.22***
Romania	Pillar III	.13	2.86	1.84	4.12	2.91	1.99*	n.a.	8.38***	35.27
	AZT Moderato	.15	3.24	2.23	3.14	2.24	1.90*	-1.33*		2.30*
	AZT Vivance	.04	2.76	1.77	14.84	12.70	2.48	-1.50*		7.32***
	BCR Plus	.24	1.23	1.36	3.50	2.77	2.53	1.18*		4.90**
	NN Activ	.12	2.69	2.03	3.96	2.94	1.56(.74*)	3.63		6.92***
	NN Optim	.33	1.43	1.91	1.68	2.21	1.80*	n.a.	.40*	4.03**
Ukraine	Pillar III	.21	1.32	3.97	1.32	3.69	2.05*	n.a.	.15*	.57*
	Europe	.06	10.2	1.73	10.03	1.62	2.40*	-4.57		9.25
	OTP Pension	.23	1.99	2.23	1.99	2.23	2.12*	n.a.	.002*	42.80
	Pension Capital	.18	1.41	2.30	2.05	3.17	1.60**	n.a.	1.77*	.43*
	Social Standard	.17	1.15	5.69	1.03	5.43	1.37	n.a.	.41*	2.65*
	Vzaemodopomoga	.17	1.38	5.49	1.32	4.60	1.41	n.a.	13.05	1.30*

[a]The Durbin – Watson statistic value for BDM; [b]n.a. = not available (a negative square root error); [c]in parentheses is the LM•-statistic for cases where the DW-statistic falls in the inconclusive region; *significance at .05 level; **significance at .01 level; ***significance at .001 level.

However, before analyzing the quality of fitting models and the diffuse process, it is necessary to check the fulfillment of the conditions of the Gauss-Markov theorem. Table 2 reports the results of testing the null hypotheses of the absence of residual autocorrelation and homoskedasticity of residues. Durbin-Watson test results for 14 Bass models (2) indicate that the null hypothesis is not rejected and no significant residual autocorrelation is assumed at the .05 level of significance. Since MBDM (8) includes a lagged dependent variable, we used Durbin h-test as a test for autocorrelated residuals. In case of a negative square root error of the h-test (i.e., $Tvar(\beta_2) > 1$), we applied the F-test version of the Breush-Godfrey test that uses a modified version of the Lagrange multiplier statistics: $LM^{\bullet} = \frac{R^2}{1-R^2} \cdot \frac{T-p-k-1}{p} \approx F(p, T-p-k-1)$, where R^2 is the value calculated for

regression $e_t = \beta_0 + \beta_1 N_{t-1} + \beta_2 n_{t-1} + \beta_3 \sigma_{t-1}^2 + \beta_4 n_{t-1} \sigma_{t-1}^2 + \rho_1 e_{t-1} + ... \rho_p e_{t-p} + \delta_t$, T is the original sample size, k is the number of independent variables of (8). Recall that if $p = 1$, the BG test checks first-order autoregression and is also called the Durbin M-test. The test results indicate the rejection of null hypothesis (no autocorrelation) for only 5 MBDMs. To test the null hypothesis of homoskedasticity, we used the White test. Test results indicate rejection of the null hypothesis for only 5 MBDMs. It should be noted that multicollinearity, autocorrelation, and heteroskedasticity were found only for the Ukrainian fund Europe. A typical strategy followed by econometrics with residual autocorrelation and heteroskedasticity is the use of generalized (GLS) or weighted least squares (WLS) methods, respectively. However, Safi and White (2006) proved that if the disturbance structure is autoregressive and the dependent variable is nonstochastic and linear or quadratic, the OLS performs nearly as well as GLS in terms of efficiency of the estimates. In this sense, our models allow the use of OLS estimates, but we will bear in mind that standard errors can be underestimated.

We use an adjusted coefficient of multiple determination Adj. R^2 as a measure of goodness-of-fit for comparing models fitted to different data sets, with different numbers of observations and explanatory variables. For all types of models, Adj. R^2 is calculated by the formula $R_{adj}^2 = 1 - \left(1 - R^2\right) \cdot \frac{T-1}{T-k-1}$, where R^2 is the value calculated for the model, T is the sample size, k is the number of independent variables. Conclusions that we can draw include the following. First, as expected, the Adj. $R^2(N_t)$ for cumulative curves are significantly higher than for non-cumulative curves Adj. $R^2(n_t)$ due to the high volatility of the time series of the participants' growth.

Secondly, the adjusted R^2 values indicate that the Bass models are definitely better fitted only in three cases (12.5%), namely: Romanian and Ukrainian Pillar III, and the Romanian NN Activ. Moreover, in two other cases (the Bulgarian VPF Saglasie and the Romanian NN Optim) the goodness of fit of the cumulative curve is better, but non-cumulative is worse. Thirdly, we did not manage to avoid the negative Adj. R^2 value when evaluating the cumulative Bass model for the Czech fund NN PS and the Ukrainian fund Vzaemodopomoga. We apply the proposed Cohen and Cohen (1975) convention of reporting Adj. $R^2 = 0$ when the value becomes negative. Generally speaking, a negative value of Adj. R^2 appears when the residual mean of squares is greater than the total mean of squares and means the insignificance of the explanatory variables. Theoretically, the results can be improved by increasing the sample size. But in our case, the ratios of a sample size to independent variables are 70/2 and 162/2, that is, significantly exceed the requirement to have 20 times more observations than independent variables (Tabachnick and Fidell, 1989). At the same time, these funds have one thing in common: a significant and long-lasting reduction in the number of participants (concentration of funds): in the Vzaemodopomoga since July 2009 and in the NN PS since the first quarter of 2009. As a result, the cumulative diffusion curve is not S-curve, but a bell-shaped curve. Thus, the Bass model is not able to adequately describe the substantial and long-lasting concentration of funds; and the only strategy, in this case, is to modify the model.

Table 3

Bass Diffusion Model (BDM) and Modified Bass Diffusion Model (MBDM) OLS estimates: Bulgaria and the Czech Republic

	BDM	MBDM	BDM	MBDM	BDM	MBDM
Bulgaria						
	Pillar III		Allianz Bulgaria		Doverie	
Intercept	43396.6	9837.04****	79762.5****	68.883	74669.2***	775.95
N_{t-1}	-.1339	-.0160****	-.6763****	-.0004	-.9608***	-.0052
$(N_{t-1})^2$	1.0E-07		1.4E-06****		3.1E-06**	
n_{t-1}		.5118****		.8940****		.4100****
Variance		-5.6E-05		-.0003**		.0001****
Interaction		-8E-08****		-7E-07****		-1E-07****
Adj. $R^2(n_t)$	.0696	.2476	.2249	.6448	.0519	.2356
Adj. $R^2(N_t)$	.6716	.9140	.8173	.9918	.3082	.4250
Observations	177	177	177	177	177	177
	DSK-Rodina		NN VPF		Saglasie	
Intercept	390.31**	-118.65	1687.41	632.06***	-15763.1****	139.23
N_{t-1}	-.0101	.0069****	-.0797	-.0158***	.7866****	-.0027
$(N_{t-1})^2$	2E-07***		9.6E-07		-9.3E-06****	
n_{t-1}		.3050***		.2809*		1.8985****
Variance		.0002		-6.4E-05		-2.1E-05
Interaction		-6E-07*		-1.4E-07		-3E-07****
Adj. $R^2(n_t)$	.1980	.2200	.0576	.0696	.0605	.5106
Adj. $R^2(N_t)$	.9763	.9871	.9320	.9441	.9158	.9114
Observations	186	186	177	177	177	177
The Czech Republic						
	Pillar III		Allianz PS		CS PS	
Intercept	231305****	341499****	-8233.7	2007.5	-70130****	9911,7
N_{t-1}	-.0995***	-.0561****	.1795	-.0036	.2942****	-.0093
$(N_{t-1})^2$	1.1E-08**		-3.4E-07		-2E-07****	
n_{t-1}		.1626*		1.1579****		.6433****
Variance		-9E-06****		-1.4E-06		4.3E-06
Interaction		1.2E-11*		-5E-10****		-4E-10****
Adj. $R^2(n_t)$	.2093	.3542	.0075	.1515	.2806	.2878
Adj. $R^2(N_t)$	.8652	.9668	.7859	.9143	.9314	.9729
Observations	96	96	71	66	70	66
	CSOB PS		KB PS		NN PS	
Intercept	-95133****	7277*	-76548****	7435	34218*	8996**
N_{t-1}	.4372****	-.0106	.4644****	-.0130	-.1361	-.0238**
$(N_{t-1})^2$	-4E-07****		-6E-07****		1.3E-07	
n_{t-1}		.7819****		.6408****		.7155****
Variance		-1.3E-06		5E-06		3.3E-05**
Interaction		-2E-09****		-2E-09****		-7E-09****
Adj. $R^2(n_t)$	.2685	.6123	.3320	.2929	.1869	.6278
Adj. $R^2(N_t)$	.4829	.9844	.9676	.9773	0	.8527
Observations	70	66	70	66	70	66

* $p < .10$, ** $p < .05$, *** $p < .01$, **** $p < .001$

Table 4

Bass Diffusion Model (BDM) and Modified Bass Diffusion Model (MBDM) OLS estimates: Romania and Ukraine

	BDM	MBDM	BDM	MBDM	BDM	MBDM
Romania						
	Pillar III		AZT Moderato		AZT Vivance	
Intercept	16661.3****	7013.0****	6707.56****	5276.01****	5564.86****	355.82****
N_{t-1}	-.0913****	-.0149****	-.4138****	-.1360****	-.5234****	-.0172****
$(N_{t-1})^2$	1.4E-07****		6.4E-06****		1.2E-05****	
n_{t-1}		.3596****		.3198****		.4538****
Variance		-5.4E-06		-.0003****		-.0003
Interaction		-4.7E-09*		-1.6E-08		-2.6E-06
Adj. $R^2(n_t)$	.4836	.3040	.7250	.7441	.5899	.5548
Adj. $R^2(N_t)$	.9759	.9188	.8015	.9368	.8104	.9149
Observations	133	133	133	133	133	119
	BCR Plus		NN Activ		NN Optim	
Intercept	3266.45****	333,73***	3647.64****	1364.4****	2712.04****	2204.9****
Intercept	-.0531****	-.0005	-.2213****	-.0311****	-.0337***	-.0085***
N_{t-1}	2.6E-07****		3.4E-06****		1.6E-07***	
$(N_{t-1})^2$		.4621****		.7432****		.3034***
n_{t-1}		.0019****		-.0004****		-.0001**
Variance		-2E-06****		-7.3E-08		9.2E-08**
Interaction	.2543	.5094	.7955	.5924	.0723	.1023
Adj. $R^2(n_t)$	.9793	.9973	.9020	.8234	.9931	.9777
Observations	133	119	133	133	133	133
Ukraine						
	Pillar III		Europe		OTP Pension	
Intercept	20825.67	45815.3***	503.06	2169.85	.6590*	.7564**
N_{t-1}	.0478	-.0497*	.4536****	-.0184	.0293	-.0411***
$(N_{t-1})^2$	-8.7E-08		-3E-06****		-.0012	
n_{t-1}		-.1815		.7969****		-.2772**
Variance		-5.3E-07		1.9E-06		.6883**
Interaction		2.3E-11		-3E-08****		.4696*
Adj. $R^2(n_t)$	.0439	.0069	.7667	.6186	.0373	.0771
Adj. $R^2(N_t)$	.9138	.8813	.9696	.9872	.7944	.8902
Observations	56	52	52	52	116	116
	Pension Capital		Social Standard		Vzaemodopomoga	
Intercept	37.24****	34.30****	75.46***	60.86**	30.39****	23.36***
N_{t-1}	-.0192	-.058****	.0043	-.0120**	.0008	-.0217***
$(N_{t-1})^2$	-7.3E-05		-3.7E-06		-2.4E-05	
n_{t-1}		.0532		.7391****		.7010****
Variance		.0023		-.0002		.0098*
Interaction		.0006*		-2E-05***		-.0007***
Adj. $R^2(n_t)$	.3930	.4358	.0852	.1936	.2104	.3781
Adj. $R^2(N_t)$	.9294	.9461	.4592	.8263	0	.5831
Observations	92	92	165	153	162	150

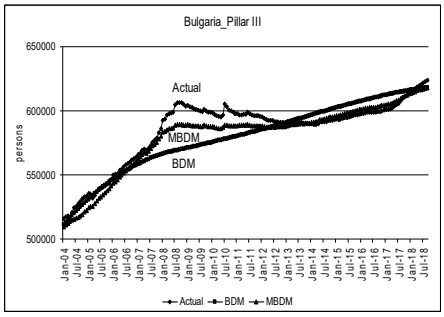
*$p < .10$, **$p < .05$, ***$p < .01$, ****$p < .001$

Figure 1 and Figure 2 visualize the goodness-of-fit of the models to the data. In all cases, with the exception of Ukrainian Pillar III, the MBDMs are better fitting than the BDMs (even for the Romanian Pillar III). In this sense, the results of modelling by VPF Allianz Bulgaria and the Czech fund CSOB PS are especially indicative. As for the Ukrainian Pillar III, none of the models captures a Q4-13 jump (participants' growth of 42.64 %). However, after the jump, the BDM is a well-fitting model; probably it should be used in forecasting.

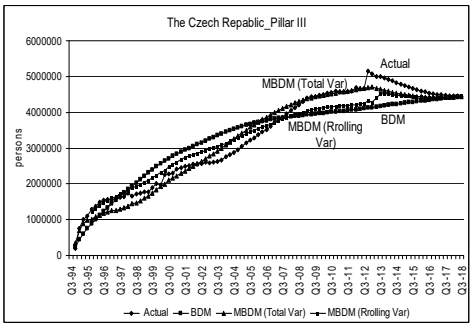
Figure 1

Actual and predicted cumulative number of participants in national Pillars III

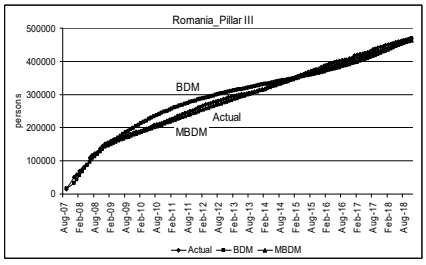
a) Bulgarian Pillar III



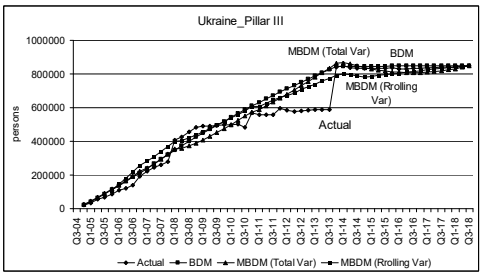
b) Czech Pillar III



c) Romanian Pillar III



d) Ukrainian Pillar III

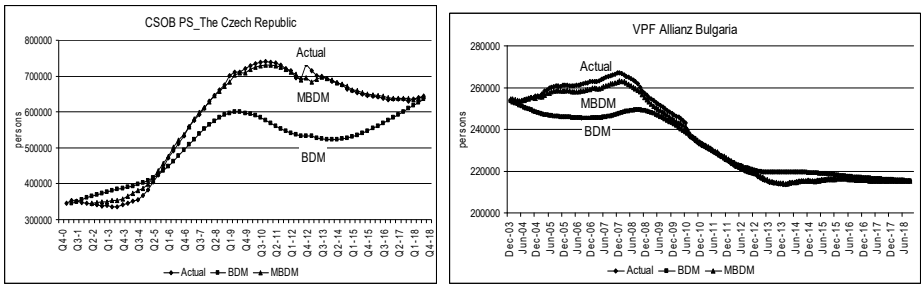


The following remark applies to Czech Pillar III. For these data, the rolling variance showed significant moderation (see Table 1), but the model with the total variance is better fitted. We obtained for the model with a rolling variance Adj. $R^2(n_t) = .1425$ and Adj. $R^2(N_t) = .9310$, and for the model with a total variance, these coefficients are .3542 and .9668, respectively. In addition, Figure 1 shows the best fitting for this model. Therefore, we recommend using a model with a total variance (see Table 3), i.e., a better fit of one model over another to a given data set is a reason to prefer that better fitting model, and there is no difference in the complexity variables (Schunn and Wallach, 2005). This approach should be used in the practice of funds.

Figure 2

Multiple cascading S-curves in the evolution of voluntary pension funds

a) CSOB PS (The Czech Republic) b) Allianz Bulgaria



As for the hypotheses about the existence of informational cascade, the effect of variance in the flow of participants and its moderation, the decision on their acceptance/rejection is made based on the significance of the estimated parameters β_2, β_3 and β_4 of MBDM (8). As Table 3 and Table 4 show, the empirical testing supported the hypothesis H_1 about the existence of informational cascades for Pillar III in all countries, except for Ukraine, and for all funds, except for Ukrainian Pension Capital. Moreover, only for Ukrainian data, we obtained a negative β_2 values. These are Pillar III, OTP Pension, and Magistral. The reasons for the results that are different from other countries are obvious. Ukraine differs from other countries, firstly, by significant political and, as a result, financial and economic turbulence. Secondly, in corporate pension funds employers use the nudging mechanism, but this process is also uneven both in time and in space due to the political and economic instability. Therefore, individuals at the collective level make pension decisions in the conditions of current instability, ignoring both their own signals (about the need for additional voluntary pensions) and the actions of earlier participants. Most likely, in the whole country, we observe "herd behaviour on the contrary" – the collective unwillingness to think about financing future retirement benefits, including employers.

With regard to the second hypothesis, for all national Pillars III, the variance of the participants' growth in the previous period is the inverse measure of the level of joining in the current period. However, we received strong evidence of this hypothesis (p-value < .001) only in the Czech Pillar III. For pension funds, the results are different, and there is no dependence on the level of a country's development or pension reforms. Romania demonstrates the most stable results; only BCR Plus shows the positive effect of rolling variance on the participants' growth that has become quite stable since 2013 – the value of the correlation coefficient is .5992.

Finally, on the third hypothesis, the interaction effect is negative in the Bulgarian and Romanian Pillars III, but positive in the Czech and Ukrainian (in Ukraine, as expected, moderation is not significant, see Table 1). In addition, in all pension funds, except for the Romanian NN Optim and the Ukrainian OTP Pension and Pension Capital, the interaction

effect is negative. For 13 out of 20 pension funds, empirical evidence confirms the significant negative impact of the interaction between the participants' growth and its variance in the previous period on the participants' growth in the current period; and variance is a moderator of the interaction effect. The controversial result obtained from Czech data should also be noted, namely: the positive impact of the interaction in Pillar III (p-value < .1) and the statistically highly significant negative impact of interaction in all funds (p-value < .001).

4.2.2. Parametric analysis of diffusion patterns

This part of the discussion focuses on analyzing the estimated diffusion parameters for the Bass model and the modified model that are shown in Table 5. First of all, it should be noted that when using the Bass model, we received a negative root error in 9 cases, and the modified model allowed us to avoid this error and find the diffusion parameters. MBDM identified 4 types of diffusion: (i) a successful product ($q > p$); (ii) unsuccessful product ($q < p$); (iii) negative diffusion ($q < 0$); (iv) multiple cascading S-curve ($p < 0$). Diffuse processes with negative q or p parameters require detailed analysis.

A negative q does not necessarily mean a negative WoM effect, due to the fact that most of the previous participants are dissatisfied with a new pension product or fund. There are several reasons that inhibit imitation and, therefore, cause the concentration of voluntary pension provision. First, the negative effect of word of mouth can be caused by the rejection of the new product due to premature introduction (Kalish and Lilien, 1986). In post-communist countries, breaking established behavioral pattern – an orientation toward state paternalism in welfare provision – is a long process; and the early introduction of voluntary pension provision is the reason why society does not accept it. The most significant in this sense is Ukraine, where the impact of socialism was the longest: the innovators accepted voluntary pensions, but there were not enough imitators to start diffusion. In addition, the paternalism of employers replaced the state paternalism and the nudge mechanism explains the spasmodic nature of the cumulative curve of the Ukrainian Pillar III; and individual entry into voluntary pension funds has not acquired the nature of a mass process.

Secondly, "negative information tends to be more diagnostic or informative than positive or neutral information" (Herr et al., 1991), it spreads faster (especially in combination with the previous aspect) and the overall effect becomes negative. Third, the negative WoM disseminated by resistance leaders significantly undermines market growth; the more prolific and influential these resistance leaders are, the smaller the eventual market (Moldovan and Goldenberg, 2004). For example, in Ukraine, such influential resistance leaders are life insurance companies. Fourth, negative q may correspond to the case when the benefit from a product declines as more people adopt (Orbach, 2016). For instance, for some corporate funds, the local market has reached its potential. Finally, the savings behaviour of people is subject to the negative impact of political and economic crises; and the poorer the country, the stronger and more prolonged such influence. Figure 1 shows that in all 4 countries, the diffusion of voluntary pensions (Pillar III) slowed down in 2008 –

2009, especially in Bulgaria and Ukraine. During this period, the imitation coefficient is negative in all countries, including Romania, where the average value is positive.

Table 5

Estimated diffusion parameters

Model	Pillar III, VPFs	*p*	*q*	Comments	Pillar III, VPFs	*p*	*q*	Comments
Bulgaria					The Czech Republic			
BDM	Pillar III	n.a.[a]	n.a.	n.a.	Pillar III	n.a.	n.a.	n.a.
MBDM		.0160	-.0068	concentration		.0561	-.0921	concentration
BDM	Allianz Bulgaria	.3720	-.3043	concentration	Allianz PS	-.0172	.1623	multiple S
MBDM		.0004	.0030	successful		.0036	.0154	successful
BDM	Doverie	.4970	-.4638	concentration	CS PS	-.0724	.2218	multiple S
MBDM		.0052	.0305	successful		.0093	.0303	successful
BDM	DSK-Rodina	n.a.	n.a.	n.a.	CSOB PS	-.1366	.3006	multiple S
MBDM		.0069	-.0051	concentration		.0106	.0498	successful
BDM	NN VPF	n.a.	n.a.	n.a.	KB PS	-.1428	.3216	multiple S
MBDM		.0158	.0033	unsuccessful		.0130	.0281	successful
BDM	Saglasie	-.3078	.4788	multiple S	NN PS	.0858	-.0503	concentration
MBDM		.0027	.0358	successful		.0238	-.4043	concentration
BDM	CCB-Sila	-.3024	.3546	multiple S	PS CP	-.0277	.1874	multiple S
MBDM		.0195	.1093	successful		.0310	.0896	successful
Romania					Ukraine			
BDM	Pillar III	n.a.	n.a.	n.a.	Pillar III	.0248	.0726	successful
MBDM		.0149	.0179	successful		.0497	-.0168	concentration
BDM	AZT Moderato	.2201	-.1937	concentration	Europe	.0037	.4573	successful
MBDM		.1360	-.2298	concentration		.0184	-.1321	concentration
BDM	AZT Vivance	.2783	-.2451	concentration	Magistral	n.a.	n.a.	n.a.
MBDM		.0172	.0095	unsuccessful		.0574	-.0774	concentration
BDM	BCR Plus	n.a.	n.a.	n.a.	OTP Pension	.0166	.0459	successful
MBDM		.0005	.0084	successful		.0411	-.0194	concentration
BDM	NN Activ	n.a.	n.a.	n.a.	Pension Capital	.0624	.0433	unsuccessful
MBDM		.0311	-.0182	concentration		.0576	-.0226	concentration
BDM	NN Optim	n.a.	n.a.	n.a.	Social Standard	.0147	.0190	successful
MBDM		.0085	.0008	unsuccessful		.0120	.0047	unsuccessful
BDM	Pensia Mea	.1987	-.1166	concentration	Vzaemodopomoga	.0264	.0272	successful
MBDM		.0560	.0084	unsuccessful		.0217	.0119	unsuccessful

[a] *n.a. = not available (a negative square root error when estimating m)*

The following concerns diffusion with a negative innovation coefficient. The interpretation of a negative *p* value does not necessarily mean that the product is useless (Orbach, 2016). In the case of long-term dynamics of voluntary pension provision, diffusion graphs with negative *p* show multiple cascading S-curves (see, e.g., the BDM trajectory for SCOB PS). S-curves are known to cascade with a new one beginning where the last one leaves off (Modis, 2007); new pension schemes (products) replace old schemes just as new technologies replace old technologies. In this sense, we obtained the expected results in the Czech Republic. Table 5 shows that in 5 of 6 founds, the BDM-estimates of innovation coefficients are negative, while $q > |p|$, i.e., these are cases where sowing (reform 2013) overcomes the barriers to adoption, expressed by a negative *p*. Notably, MBDM-estimates

identify a successful product, since $q > p$, p and q are positive. Figure 2 demonstrates which diffusion identification is more accurate for the CSOB PS. On the BDM graph, a pronounced new growing wave (since 2013) doesn't fit the actual pattern. At the same time, the MBDM resulted in a well-fitted curve that shows the growth in participants since the fourth quarter of 2017. However, for the Czech Pillar III and NN PS estimates indicate negative diffusion. In particular, Figure 1 illustrates that, both actual and predicted by the modified model, the total number of participants in Pillar III continues to decline. Probably, an additional fall in the number of participants reflects the natural difficulties associated with structural changes in voluntary pension provision. In addition, the introduction of a new product (pension reform) should take place in a timely manner so that there is no decline during the transition period.

In the terms of multiple cascade S-curves, we obtained similar findings for the Bulgarian VPFs Saglasie and CCB-Sila explained by the transformations. For example, the merger of CCB-Sila and Lukoil Garant-Bulgaria-VPF caused a downswing wave in the trajectory of the total number of participants, which was later replaced by an upswing wave. In addition, the Allianz Bulgaria diffuse curve should be noted. For this fund, BDM estimates ($p > 0$, $q < 0$) identify negative diffusion; and the MBDM estimates ($p > 0$, $q > 0$, $q > p$) identify a successful product, but $p \to 0$. Figure 2 shows that (i) the MBDM-curve is better fitted, and (ii) since 2014, a new growing wave of the fund's life cycle has been observed. Thus, $p \to 0$, as well as $p < 0$, recognizes the case of multiple cascading S-curves.

5. Conclusions and perspectives

When modelling the diffusion of pension innovations – voluntary pension schemes – the original Bass Diffusion Model does not always provide interpretable results. Therefore, our study consisted of two aspects: (i) the modification of hypotheses and the BDM specification in terms of observational learning, and (ii) hypothesis testing and analysis of the diffusion of voluntary pension coverage using estimated models based on data from 4 CEE countries: Bulgaria, the Czech Republic, Romania and Ukraine. The first hypothesis about the informational cascade in joining the voluntary pension provision has been convincingly confirmed in all countries, except Ukraine. This result is explained as follows: (i) in the Czech Republic, the influence of the behaviour of previous participants is enhanced by strong state financial support; (ii) in Romania, voluntary pension funds are occupational and this also supports the information cascade; (iii) Bulgaria has a real interest in voluntary private pensions, perhaps because the old-age dependency ratio is the highest (32.02%); (iv) in Ukraine, high political turbulence causes unstable behaviour in the field of voluntary pension savings. Regarding the second hypothesis, the variance of the flow of information about the growth of participants is indeed the inverse measure of the level of perception of a new pension product in all national Pillars III. However, this conclusion is statistically significant only for the Czech Pillar 3. At the same time, the hypothesis for the Czech pension companies is rejected; this once again confirms that the decision to join is mainly dependent on state subsidies for private pensions. We confirmed the third hypothesis about the negative moderation effect of variance on the information cascade in all Bulgarian and Czech funds, in three Ukrainian NPFs and in one Romanian fund.

As for the goodness-of-fit of the models, the modified models were unambiguously (that is, both non-cumulative and cumulative diffuse curves) better fitted for 87.5% of time series. In addition, the modified models allowed us to avoid the error of the negative root, which was obtained by the Bass model, and therefore we were able to identify diffuse processes. We obtained an interesting result when the BDM-estimate of the innovation coefficient is negative, but the MBDM-estimate is positive. We argue that this diffusion of voluntary pensions is described by a multiple cascade curve, and the pension product (scheme or fund) is successful. We identified such diffusion in 5 of 6 pension companies in the Czech Republic, where a structural reform of Pillar 3 was carried out in 2013, as well as in 2 Bulgarian funds, where funds merged and new organizations joined. Thus, we conclude that the modified model allows us to correctly describe the wave-like nature of the evolution of voluntary pension provision, which is caused by pension reforms and fund transformations.

Our findings will be useful to policymakers and actuaries in both transition economies and high-income countries, since the issue of the development of voluntary pensions is on the agenda in all countries. Future empirical research may examine the effects of observational learning on joining voluntary funds in age and gender contexts. Future theoretical research may assess the impact of the financial indicators of the performance of voluntary funds in combination with the income of the population.

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SUMMARIES

Victor Yotzov

FOREIGN DIRECT INVESTMENTS AND ECONOMIC GROWTH IN BULGARIA: THEORETICAL CHALLENGES AND EMPIRICAL RESULTS

The assessment of the strength and direction of the link between foreign direct investments (FDIs) and economic growth has long been the focus of research activities, but empirical findings remain mixed. Most results, however, show that the overall effect of FDIs is positively related to growth and vice versa. At the same time, it is widely argued that the impact of FDIs is closely related to the so-called 'absorptive capacity' of the host economy, with the highest weight being the quantity and quality of the workforce; the degree of trade openness and economic freedom; the fiscal policy pursued and the degree of financial development. These are key factors for the effectiveness of foreign direct investment, which in turn further stimulate economic growth. The present study provides an overview of the basic theoretical concepts and empirical assessment of the impact of FDIs on the rate of economic growth in Bulgaria, taking into account other factors of growth as well. Quarterly data for the period 1990 Q1-2019 Q3 were used for this purpose. Relevant conclusions and recommendations are made regarding the economic policy pursued.
JEL: F21; F23

Lesia Tkachyk
Mariya Rubakha
Nataliia Ilkiv

OPTIMIZATION OF CORPORATE PROFIT TAXATION IN THE CONTEXT OF STIMULATING THEIR INVESTMENT ACTIVITY: THE CASE OF UKRAINE

The article describes various methods of tax optimization in the implementation of corporate tax management of a business entity, in particular mechanisms for reducing the tax base, using tax breaks, and a special tax regime, changing the place of registration of taxpayers.
The methodology of economic and mathematical modelling was used to optimize the tax burden of a business entity by balancing between the part of corporate income tax (investment tax credit), that an enterprise should use for investing, and the part paid to the budget.
The developed economic-mathematical model of determining the proportion of «investment tax credit» entity has two objective functions – maximum value of the entity's profit and maximum of the accrued taxes sum. The offered economic-mathematical model will allow to define effective strategies of management of enterprise's profit and demonstrate advantages of preferential taxation for activation of investment activity of the enterprise.
JEL: C02; H25; H32; G30

Stoycho Dulevski

SCIENTIFIC AND APPLIED CHALLENGES IN THE CONCEPT "FIXED ESTABLISHMENT" IN THE MODERN TAX SYSTEMS

This paper presents a research on the concept of the "fixed establishment" (FE) regarding the European and the Bulgarian tax practice. The term determines the place of supply of services in the field of indirect taxation which reflects the fair taxation. The aim of this study is to examine the key features of the FE both from practical and theoretical aspect and to draw a conclusion on the future of the concept. The comparison between the European and the domestic legislation outlines the significance of the FE and provides a more detailed survey on its legal nature.
JEL: K2; K33; K34

Inna Lola

A MULTIDIMENSIONAL CLASSIFICATION FOR THE INFORMATION TECHNOLOGY MARKET

This paper expands the existing informational and analytical opportunities of application of the results of business tendency surveys which solve the problem of the loss of valuable statistical information in its traditional aggregation into simple and composite indicators. Based on methods of multidimensional classification, we develop and discuss an algorithm of statistical analysis that significantly raises the analytical opportunities for the more wide measurement of trajectories of development and short-term fluctuations of the information technology (IT) industry. This allows the construction of behavioural models of business tendency data which improve the understanding of the business cycle in more detail. Furthermore, the empirical results confirm the possibility of receiving various information which increases the analytical potential of business tendency surveys.
JEL: C1; C81; C38; C83; E32; E39; L26; L1; O10; O11; O19; M2

Yanica P. Dimitrova

CORPORATE SOCIAL RESPONSIBILITY AND INNOVATION – THE MEANINGFUL CONNECTION

The purpose of this study is to present the relationship that exists between the Corporate Social Responsibility concept and the innovations realised by companies. The connection is determined by corporate culture and is linked to overall organisational performance. The fundamental theoretical statements of the above constructs are outlined, as well as the relationship that exists between them. The importance of the CSR – innovation relationship is formulated. The theory is exemplified by a case study of a real Bulgarian company, VB Studio Ltd.

The conclusion is that understanding the essential importance of the two-way link between the implementation of innovation in the context of CSR leads to an increased overall organisational performance by meeting specific public needs, and current general needs encourage the generation and introduction of innovation.
JEL: M14; O30

Marica Antovska-Mitev

MACEDONIAN NATIONAL INNOVATION SYSTEM – STATES, CHALLENGES AND PERSPECTIVES

The key segments of Macedonian National Innovation System: business sector, research sector, technology transfer system and in its institutional policy framework are analysed in the paper. The results of the performed analyses point the numerous weaknesses in its key segments, particularly detected in the domain of financial and human resources, intellectual property rights, implementation of the key strategic documents and efficiency of the institutions. This paper results in a series of recommendations for innovation policy intervention that can be considered for the National Innovation System improvement.
JEL: O38; O32; O52

Ngo Xuan Binh
Nguyen Thi Ngoc
Le Thi Hang Nga
Tran Ngoc Diem

ECONOMIC INNOVATION IN VIETNAM IN THE PERIOD AFTER 1986

During the period from 1975 to 1986, Vietnam had to face a serious economic crisis. Difficulties and problems came from poverty, war consequences, unfavourable changes of the international situation and especially the outmodedness of the economic model of centralized bureaucratic planning. Therefore, Vietnam had to undertake a program of economic innovation, known as "Doi Moi" (Innovation) in 1986. Up to now, after 34 years, Economic Innovation has brought many achievements in terms of growth rate, the scale of the economy, the shifting of the economic structure toward modernization, institutional innovation and extended international integration… However, at the same time, there remain problematic issues such as quality of growth, productivity and sustainable development…., to be tackled with. In fact, this is the first economic innovation (1986-2019). These contents will be analyzed and evaluated by the article on the basis of the model of economic innovation through a process of change and continuity in the market economy thinking in Vietnam.
JEL: N00

P. Karacsony
M. V. Vinichenko
T. S. Demchenko
Sz. Szabo
M. V. Demchenko

EXAMINING THE CHARACTERISTICS OF THE LEADERS IN NON-PROFIT ORGANIZATIONS

At almost every moment of our lives, we are in contact with organizations. Our daily actions are greatly influenced by organizations around us, from school and non-profit organizations to workplaces. In our study, we deal with the particular case of non-profit organizations.
The current study provides a deeper insight into the factors of effective leadership of non-profit organizations. The research conducted in the period from 2018 to 2019, made it possible to establish that the leaders of Hungarian non-profit organizations mostly belong to the transformational

leadership style. Our purpose with this study is to provide an understanding of the leader's characteristics which has an impact on non-profit organizations' operating.
JEL: M10; M12; M13

Larysa Yakymova

DEVELOPMENTAL PATTERNS OF VOLUNTARY PENSIONS IN CEE COUNTRIES: ANALYSIS THROUGH THE BASS DIFFUSION MODEL REFLECTING THE OBSERVATIONAL LEARNING MECHANISM

Global population ageing forces governments to transfer pension risks to individuals and employers by introducing voluntary private components into national pension systems. Diffusion theories in combination with behavioural economics can help to understand the nature of developmental patterns of voluntary pensions. This paper modifies the Bass Diffusion Model by introducing hypotheses regarding the information cascade when joining a voluntary pension schemes, a variance of participants' growth and its moderation effect on the information cascade. We trace the diffusion of voluntary pensions in four CEE countries (Bulgaria, the Czech Republic, Romania, and Ukraine), and show *that the modified model delivers better overall performance than previous models both in terms of model fit and* understanding this process. In addition, we demonstrate that the modified model allows us to correctly describe the wave-like nature of the evolution of voluntary pension provision caused by pension transformations.
JEL: C52; G23; P36