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THE FACTORS OF DEVELOPMENT OF THE IT-SECTOR IN TIMES OF ECONOMIC INSTABILITY: THE EXAMPLE OF HUNGARY AND BULGARIA

The article presents the results of a study of the dependence of the annual turnover of the IT segment in Hungary and Bulgaria on groups of factors with the definition of the most influential groups for each country separately. The analysis of the IT/ITC sectors of the countries in terms of economic efficiency and the quantitative indicator of companies is presented in general. An indicator of the dimension of companies for each of the countries is also presented. The main indicator of the financial efficiency of companies for both countries was the annual turnover of companies. Three main areas were classified as groups of influence: tax rates, educational component indicators, and labor force indicators. Tax rates were considered under three main types: corporate tax, payroll tax, and social contributions. The educational component as a group of factors was divided into two subgroups: the quantitative characteristics of students, graduates, and education costs. The group of labor force factors was based on analyzing the number of employees in IT/ITC and company-level staff costs. Based on correlation regression and vector autoregression, each influencing factor group was analyzed when creating optimal models. Based on econometric analyzes and tests (for example, the Granger test), systems of factors influencing the performance indicator of technological companies in Hungary and Bulgaria were derived.

Key words: *turnover, IT sector, IT, tax rates, labor force, education spending, influencing factors, ITC, IT specialists, revenue.*

JEL classification: D22, E24, E62, E65, H32

Problem statement. The problem of searching for factors influencing the efficiency of companies is encountered regularly. The main reason is to determine the optimal environment for developing companies for a segment, country, and industry separately. In a period of financial and economic instability, determining factors of companies' development allows one to understand the most favorable development scenarios further to influence economic indicators' growth in the country. In addition, it makes it possible to identify the most stable groups of factors that allow for growth during financial instability.

Literature review. According to the studied literature, the influence factors are diverse. In the context of this issue, researchers have analyzed both the impact of economic and financial crises on companies' efficiency and determined companies' behavior regarding their expenditures as growth factors. For example, Cruz Castro et al. (2018) noted that not all companies begin to reduce spending on their growth factors, such as costs R&D. Hence according to Bollen et al. (2005), Barney (1991) determined the relationship between economic performance and impact factors like human capital and education. Agiomirgianakis et al. (2011) examined indicators of R&D spending, investment in human resources, science and technology graduates, and others as factors influencing the development of companies. In the work of A.V. Shapoval and S.O. Yakubovskiy, the dependence of the companies' revenues on the R&D expenses of these companies has been proved. Tax policy is the most studied group of factors influencing of companies' development. F.A.A. Sabbar and T.M.M. Sabri (2021) conducted a study on the impact of tax policy on the profitability of companies. Also, Dominese et. al (2021) reported that one of the options for increasing profits is to use tax disagreements [1–7].

Most of the studies studied were not directly related to IT/ITC. However, the existing base in most cases was based on the study of tax systems. Thus, in the work of R. Katz, and J. Jung, the influence of specific tax rates on the telecommunications sector regarding companies' decisions on the investment component was noted and given. In addition, Dominese et. al (2022) studied tax policy at the state level when determining special conditions for a sector or segment influencing the economic component of IT/ITC companies [8,9].

It is noted that IT/ITC as an industry has its characteristics in regions and countries. Therefore, improving the results of companies in this area requires the creation of an optimal external environment that requires further research.

The aim of the article is to identify the main factors influencing the economic efficiency of IT/ITC companies in Hungary and Bulgaria.

The main material. The fundamental indicators of technology sectors are the number and size of companies. The figure below shows the dynamics of the number of IT/ITC sector companies in Hungary and Bulgaria from 2008–2021.

Quantitative indicators by country allow noting a significant predominance of the number of companies in Hungary compared to Bulgaria. However, the trends in

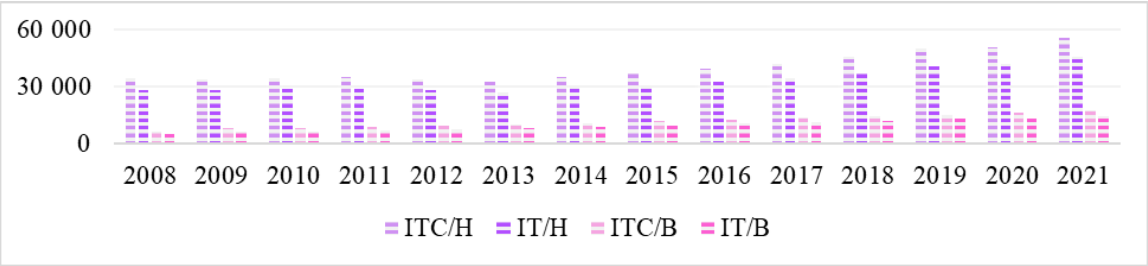


Figure 1 – Comparative dynamics of the number of IT/ITC companies in Hungary and Bulgaria during 2008–2021, units

Source: compiled by the author based on [10]

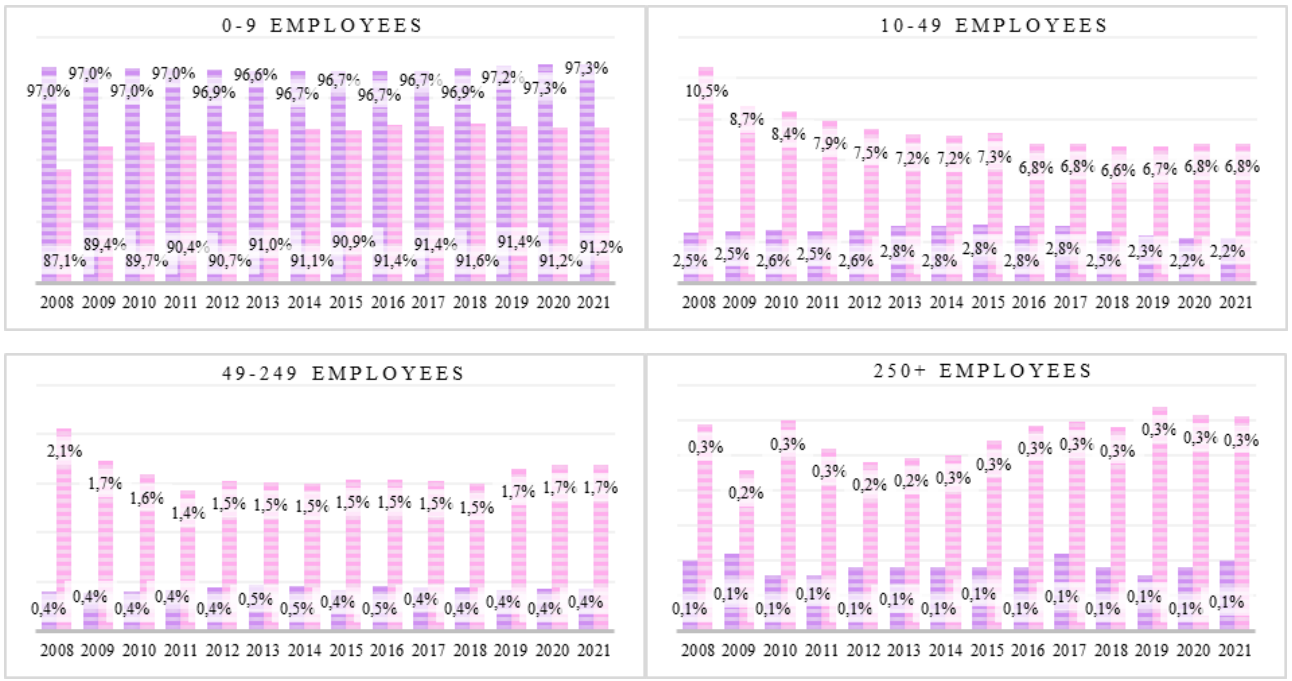
countries are somewhat opposite. There is a stagnation in the indicator of the number of companies, both representatives of the IT sector and the IT segment, in 2008–2021 in Hungary. At the same time, in Bulgaria, the number of companies in the technology segment and the information technology sector experienced growth.

Most of the Hungarian ITC sector companies are represented by IT-companies. And, the share of companies in the technology segment in the Bulgarian sector prevailed over the telecommunications segment.

A predominance of SMEs characterizes the technology segment and the information technology sector in the CEE countries. Bulgaria and Hungary are no exception. In Hungary, during the years studied, the number of SMEs in the total number of companies in the sector and segment was over 99%. The average annual value for the ITC sector was 99.89%, while the value for the segment was 99.91%. At the same time, the example of Bulgaria reflects a reasonably significant difference when comparing the indices of SME companies in the sector and the segment: the segment value is much larger than the sector value. During the years studied, the average share of Bulgarian SMEs in the sector was 63.6%, and for the technology segment – 99.72%.

According to the data provided by the statistical websites of countries and based on international organizations, indicators of the economic and financial efficiency of the IT segment companies for each country were selected. For Hungary and Bulgaria, it was determined through companies' annual turnover in the segment. For clarity, data are presented for two countries compared to the segment and sector in the figure below.

The initial analysis was carried out based on Hungarian data. The dynamics of the indicator of annual turnover from the activities of companies in the ITC sector and the IT segment have parallel dynamics. The main growth phase began in 2010. The period from 2005 to 2010 was characterized by an increasing trend for several years with significant growth indicators of the ratio of periods.



* pink – Bulgaria, purple – Hungary

Figure 2 – Comparison of the dynamics of the indicator of technology companies in Hungary and Bulgaria during 2008–2021 by size category, %

Source: compiled and calculated by the author based on [10]

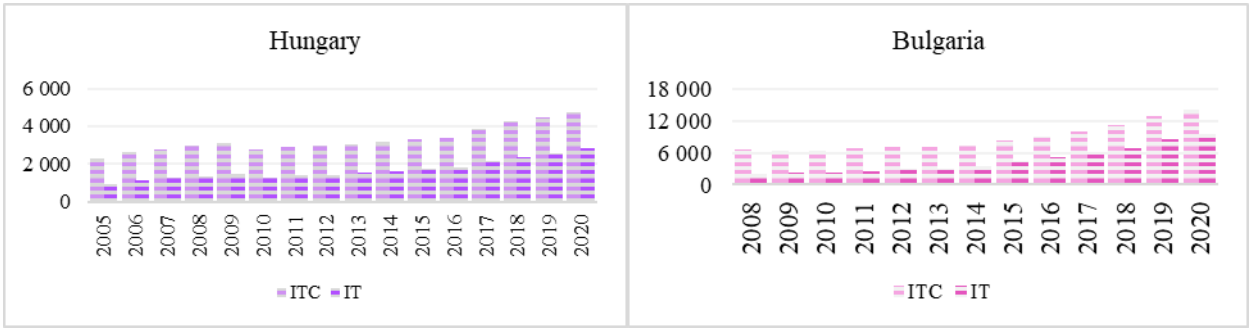


Figure 3 – Dynamics of the annual turnover of IT/ITC companies in Hungary and Bulgaria in the period 2005–2020, billion Hungarian forints and million Bulgarian levs

Source: compiled by the author based on [11–13]

In 2005, the annual turnover value for the ITC sector was 2,287 billion Hungarian forints, compared to 4,778 billion Hungarian forints in 2020. Growth over fifteen years was 2.09 times [11].

The statistical base of Bulgaria presents data for the general ITC sector without separating the subgroups of segments needed for the study. For a full-fledged analysis and presentation of data, the data of the structural categories of the ITC from Eurostat were taken with the calculated conversion of the amounts from the euro into the country's national currency. The annual turnover of IT segment companies has experienced significant growth as a share of the sector's total annual turnover. In the initial years of the study period, companies in the telecommunications segment were more effective in terms of financial review; since 2015, the situation has changed, and technology companies have formed a more significant part [12; 13].

A) Taxation rates as a factor influencing the economic performance of IT-companies.

The main rates used in the study with their historical change are corporate tax, payroll tax, and social contributions. In Bulgaria, the maximum reduction was subject to social contributions, while in Hungary, this reduction is reflected in the payroll tax.

Corporate tax rates in the studied countries are among the lowest in Central and Eastern Europe and Europe. Corporate tax in 2020 in Hungary was 9%. This tax has been established since 2016. In the period 2010–2016. the level of taxation was 19%. Taxes were low in 2005 and 2006, with a standard corporate tax of 16%. In 2006–2009, the tax consisted of two main parts: a corporate tax with a level of 16% and 4% solidarity surcharge rate. The second tax component was introduced in 2006 and took effect on 1 September for 4 years [14,15]. In Bulgaria, the corporate tax in 2020 was 10%. In the years since 2005, the value of the share of taxation did not change and remained at the standard level of 10% [16].

The payroll tax in Bulgaria for 2008–2020 remained unchanged at 10%; this value is identical to the corporate tax in the country. This rate was set in 2008. By the specified date, the three-year tax value was 24%. Going beyond the studied period, can note a decrease in the tax by 14 percentage points. The payroll tax in Hungary has changed since 2005. The overall decline was 23 percentage points. In 2020, the tax rate was 15%, and it was presented in 2016. The essential decrease was in 2011 from 32% to 16% [14–16].

Social contributions are presented separately for each country. Historical changes in Bulgaria are shown below.

Social contributions have undergone specific changes for their categories. During this period, there was an increase in the value of rates for workers and a decrease in rates for employers. The rate reduction for employers was 7.78 percentage points, while the rising rate of social contributions for workers was 3.02 percentage points.

Using the example of 2017 in Bulgaria, the main components that relate to the social contributions of companies and employees can be noted: social insurance – 13.8%, additional compulsory social insurance – 5%, illness – 3.5%, unemployment insurance – 1%, accidents – 1.1%, health insurance – 8%. The largest share is occupied by social insurance; at the same time, these are contributions of a pension nature. It should be noted that, despite the distribution of social insurance into two categories (main and additional), the total amount for 2017 was 18.8% [16; 17].

In Hungary, the subsequent decrease in changes has occurred in the social benefits of companies, as reflected in the table below.

During the study periods in Hungary, there was a decrease in the total tax rate by 35.5 percentage points from 2005 to 2020; in Bulgaria, from 2008 to 2020, the decrease was 11 percentage points.

B) Educational component as a factor influencing the economic performance of IT-companies.

Table 1 – Changes in social contribution rates in 2008–2020 in Bulgaria

Employers												
2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
26.8	18.7	18.1	17	17.9	18.1	18.1	18.1	18.1	19.06	19.02	19.02	19.02
Employees												
2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
16.8	13	12.1	12.9	12.9	12.9	12.9	12.9	12.9	13.34	13.78	13.78	13.78

Source: compiled by the author based on data [17]

Table 2 – Changes in social contribution rates in 2005–2020 in Hungary

Employers															
05	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
29	29	29	29	29	27	27	27	27	27	27	27	22	19.5	19.5	17.5
Employees															
05	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
12.5	12.5	15.5	15.5	15.5	17	17.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5

*years: 2000 = 20XX

Source: compiled by the author based on data [18]

The educational component as a group of factors was studied based on two indicators: education costs and students involved in education specializing in ITC. Expenditures were considered in each country's national currency for all levels of education and separately for higher education. These data and the indicator of spending on countries to GDP are presented in different periods for each country.

Comparing the indexes of each country's education spending concerning GDP, one can see the dominance of spending by Hungary versus Bulgaria.

In Hungary, from 2005–2020, there was a drop in the indicator's value, the overall decline in the indicator amounted to a decline of 0.56 percentage points. At the same time, in Bulgaria, during 2008–2020 there was an increase in the indicator by 0.66 percentage points, but the value is insignificant since it was less than 1 percentage point. Its one of the lowest among the CEE countries [19].

The reviewed data for Hungary allow noting the growth at the state level of spending on the educational component in the country. Growth over fifteen years was 1.73 times for higher education and 1.55 times for total education costs. A stable upward trend in spending on education has been reflected since 2013 and is characterized by a gradual increase in actual values [21].

Expenditure on education in actual recording in Bulgaria reflects an upward trend during the study period. Spending on higher education reflects the trend of total spending on the educational component: the years of decline are consistent. However, the trend is also reflected by an uptrend. The total spending from 2008 to 2020 has undergone an increase of 22.99 percentage points or an increase of 3.28 times. The average annual cost growth was 6.92% [13].

For the two countries represented, an increase in the number of students involved in training in the ITC specialization is presented. The number of students studying in Hungary in the field of ITC has experienced a significant increase since 2016. The initial number of students was 13,639 persons; in 2016, it was 10,626 persons, with an average annual decrease of 22.89 percentage points. Since 2016, the situation has been reversed, with an average annual growth of 95.55 percentage points. At the end of the period, the number of students was 22,497 persons. Since 2013, there has been an increase of 8,858 persons, or 64.95 percentage points. The number of students in Bulgaria in 2013 was 8,973 persons and in 2020 – 12,376 persons. There was an increase of 15.31 percentage points or 3,403 persons. The general trend reflects an upward trend [22].

Regarding the number of graduates in Hungary, the first half of the study period has a somewhat oscillatory trend: a year of growth and a year of decline until 2018. In 2013, the number of graduates in this specialization was 2,160 persons; in 2018 – 2,985 persons; in 2020 – 5,587 persons. Overall growth for 2013-2020 amounted to 158.66 percentage points, with an annual growth of 20.61. The number of graduates in Bulgaria was 1,862 persons in 2013 and 2,147 persons in 2020. The average annual growth for the number of graduates per category was 1.03 times. The total increase in the number of graduates in the specialization was 285 persons or an increase of 15.31 percentage points [22].

From 2013 to 2020, an increase in the share of students majoring in IT in the total number by 4.09 percentage points

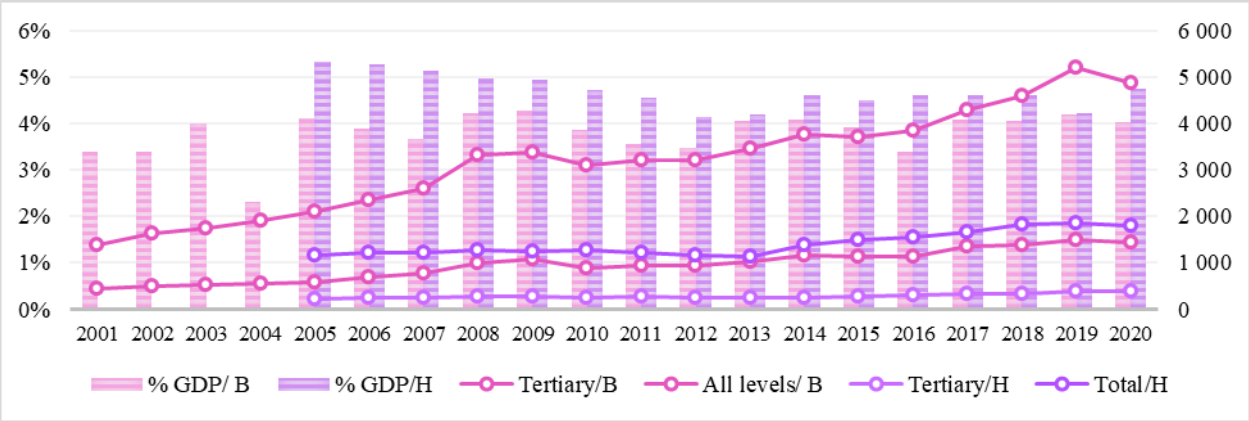


Figure 4 – Dynamics of expenditures in Bulgaria and Hungary on education, higher education, and as a ratio of expenditures on education to GDP during 2001–2020 billion Hungarian forints and million Bulgarian levs, %

Source: compiled by the author based on data [13; 19–21]

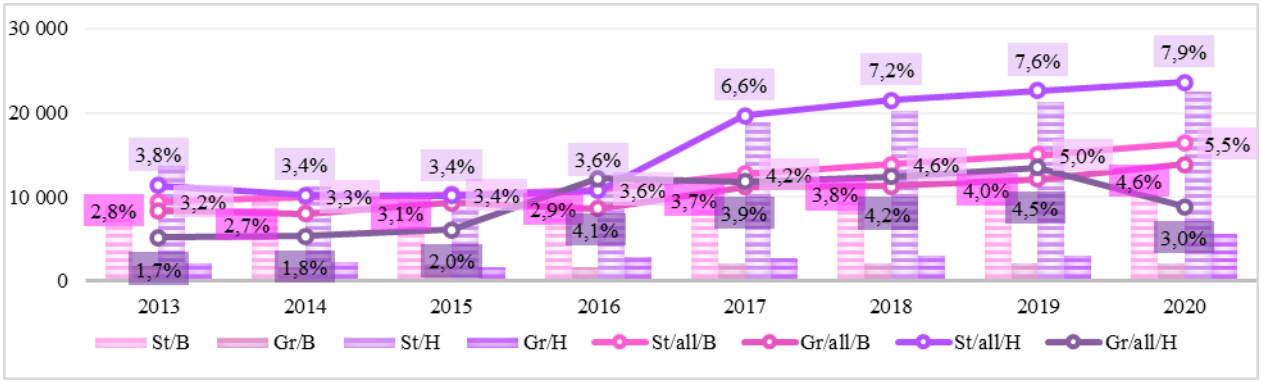


Figure 5 – Comparative dynamics of the number of students and graduates and ratio to all in Bulgaria and Hungary during 2013–2020, persons and %

Source: compiled and calculated by the author based on [22]

is noted in Hungary. The initial value of the studied index was 3.8% for students and 1.73% for graduates. In 2020, these values reflected the following shares of 7.89% and 2.97%, respectively. The growth value of the index for graduates was 1.24 percentage points. The number of students attracted to ITC in Bulgaria from all students in the country in 2020 amounted to 5.46%. There was an increase over the analyzed period by 2.3 percentage points from the value of 3.16% in 2013. For graduates, the share in 2020 was 4.63%, up 1.83 percentage points from 2.8% in 2013.

According to the studied indicators for students and graduates in the ITC specialization for both countries, can note an increase in the demand of students for this specialty and interest in this education at the university level, and not the transition to professional courses (Hungary) and the continuing trend of increasing student interest in this direction (Bulgaria).

C) Labor force as a factor influencing the economic performance of IT-companies.

The labor force category as a factor for each country was analyzed separately due to the different indicators of the study in one of the factor groups.

The general trend in the number of employees in IT/ITC in Hungary during 2008–2020 reflects an upward trend. A similar trend is reflected by the index of the employees' share in the IT segment in the ITC sector. In 2008, the segment employees in the sector were 70.6%, and in 2020 – 78.73%. There was an increase in the index by 8.13 percentage points with the reorientation of the labor force between sector segments [10].

The indicator of employees' earnings is also studied as the monthly average amount of money received by persons involved in the ITC sector. This indicator is also calculated based on the above data from the average value for the year to analyze the dynamics. These characteristics are shown in the figure below.

Companies' monthly spending on workers has been rising. As a result, the average annual growth of employees' earnings in monthly amounts in the sector amounted to 1.06 times or 5.77 percentage points. The overall value of growth amounted to 84.48 percentage points. Annualized growth indexes are similar since the final results are derived from monthly indicators [23].

The growth in company expenses as gross earnings and the number of employees reflect the parallelism due to the inter-indicator correlation. With the help of a correlation matrix, pairwise correlations between cost indicators (monthly, annual) and the number of employees (IT, ITC) were investigated. At the level of 0.98, there is a static relationship between these variables.

Bulgarian labor force data is presented below for 2008 to 2020.

The number of employees involved in IT/ITC experienced an increase during the period under review from 2008 to 2020. The sector's share of technology segment employees has been subject to gradual growth over the years. In 2008, the share of technology workers in the sector was 54.64%. The growth over the years amounted to 20.23 percentage points and reached a value of 74.87% in 2020 [10].

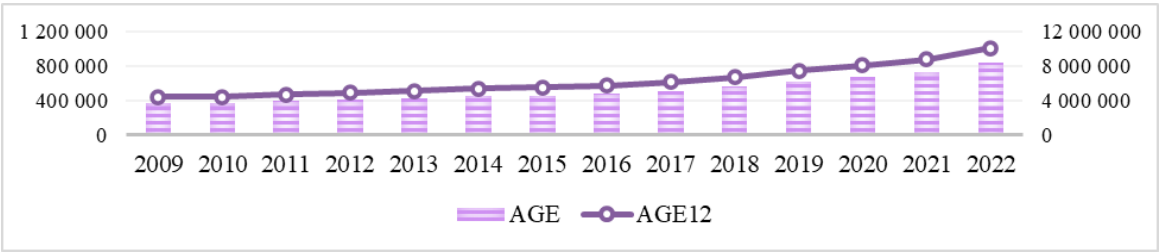


Figure 6 – Average gross earnings of employees in the ITC in 2009–2020 in Hungary (monthly, annual (12)), Hungarian forints

Source: compiled by the author based on data from [23]

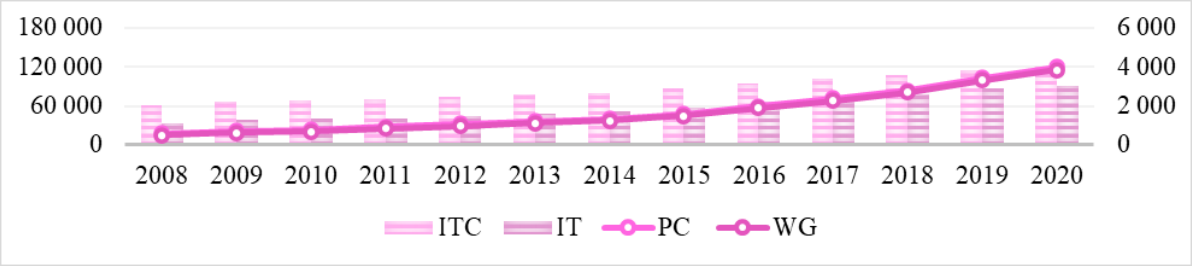


Figure 7 – Dynamics of the number of persons involved in IT/ITC, sectoral expenses for employees (PC) and salaries (WG) in IT in 2008–2020 in Bulgaria, million Bulgarian levs and persons

Source: compiled by the author based on data from [10; 12; 13]

This increase in quantitative indicators leads to an increase in the cost aspects of companies in the IT segment since an increase in the number of workers increases their costs. The expenses of IT-companies increased during the analyzed period by 671.08 percentage points or 7.71 times. In actual reflection, the growth amounted to 3,338 million Bulgarian levs [12; 13].

Personnel costs by technology companies in 2008 amounted to 604 million Bulgarian levs; in 2020, the value was 3,999 million Bulgarian levs. The increase reflects an increase of 562.4 percentage points since 2008 [12; 13].

The surveyed characteristics of the labor force have upward trends. Comparing the categories of the studied indicators, it should be noted that the growth in expenses of companies in the technology segment reflects the growing trend in the number of employees involved in the segment and the prevailing dynamics of growth indices. It allows noting that there is not only a proportional increase in costs per employee involved but also an increase in the wages themselves, which can encourage workers to choose this field of activity. It is confirmed by the results obtained from the constructed correlation matrix, according to which the correlation of indicators among themselves was 0.9895.

D) Obtained models of the dependence of the economic efficiency indicator for each country.

Based on all the data studied above, analyses were conducted to determine the impact on the economic performance indicator for each country for each group of factors. In most cases, even if there is a dependence of annual turnover on certain factors of the factor groups, the need to create a mixed system of influence factors was determined. Below are general models for combining groups of factors on annual turnover for each of the countries.

The main model for Hungary formed based on the best Var-model, while the main factors of influence are the number of persons involved in the ITC and the amount of taxable rates. The study period was 2008–2020. Hence, the general model based on the Var-study takes the following form:

$$\text{Turnover} = C_{(1,1)} * \text{Turnover}_{(-1)} + C_{(1,2)} * \text{Turnover}_{(-2)} + C_{(1,3)} * \text{Tax}_{(-1)} + C_{(1,4)} * \text{Tax}_{(-2)} + C_{(1,5)} * \text{EmpITC}_{(-1)} + C_{(1,6)} * \text{EmpITC}_{(-2)} + C_{(1,7)} \quad (1)$$

The acquired model allows studying the systemic influence of factors on the dependent change when conducting the Granger test by leveling the results of the number of employees and tax rates in the form of dependent changes. The test results are shown below.

Table 3 – The result of the Granger test for Hungary

Dependent variable: Turnover		
Excluded	**Chi-sq**	**Prob.**
Tax	6.477976	0.0392
EmpITC	23.23734	0.0001
All	43.77499	0.0001

Source: received and compiled by the author

The presented test results allow noting the influence of both factors separately and the simultaneous influence. It is noted that with a separate analysis for each factor separately for tax rates, there was less influence than with a systematic approach. With a 5% probability of accepting the hypothesis of non-influence, it is rejected; that is, the systemic nature of the factors is influential. However, despite the sufficiency of model adequacy measures concerning R^2, p-value, and log-likelihood, there is a problem with the values of AR-roots. The value of AR-roots is not adequate because not all values for the model are in the unit circle. For example, one of the AR-roots has an absolute value of 1.03, allowing to note a problem with stationarity. However, this model of all possible with different time intervals for the available data is the most appropriate to reality.

Under these conditions for the period 2008–2020. the model will take the following form:

$$\text{Turnover IT in Hungary} = -1.79e{+}06 - 1.07e{+}05\text{Tax} + 30.2\text{EmpITC} \quad (2)$$

The model fits sufficient R2 values, p-value, and log-likelihood. The acquired model is inversely and directly dependent on various factors: an increase in the number of employees and a decrease in rates will lead to an increase in annual turnover; with an increase in the tax burden and a decrease in the number of employees, the effect will be the opposite. However, despite the analyses and conformity of the adequacy model for most indicators to the base model based on Var, the polynomial issue does not allow recognizing the model as final. From here, additional impact factors exist apart from the studied factors of influence on companies' annual turnover in the technology segment.

Initially, tests were conducted for two separate groups for Bulgaria. Then, groups were built for specific periods: 2008–2020 and 2013–2020. According to the tests of the second group, a pair was determined to be optimal: the proportion of students specializing in IT and the number of employees in IT. However, against the receipt of all

model adequacy indices, according to the Granger Causality test, the influence of these categories in the period 2013–2020 was not confirmed.

Next, testing of possible groups and factors of influence was carried out under the grouping of the first type, which was noted from 2008 to 2020. After the tests, the optimal pairs of groups were selected according to the indicators of the adequacy and consistency of the models. Finally, to study the influence, a Granger Causality test was conducted for each pair or group of influencing factors, after which their probability was checked when building the final models. The results of these tests are shown in the table below.

Table 4 – Granger Causality test results and conformity with the final model for Bulgaria

Factors	lags	Res. Granger Casuality 5%	Cor. model
Study PC	2	0.0257	-
Tax Study Wg	2	-	-
Tax Emp	2	0.0015	+
Study Emp	2	0.011	-
Emp PC	2	0.0258	-

Source: received and compiled by the author

From here, the results of the Granger test for the model based on tax rates and the number of workers involved in IT acquire optimal and influential results to create the final model.

Table 5 – The result of the Granger test for Bulgaria

Dependent variable: Turnover			
Excluded	**Chi-sq**	**df**	**Prob.**
Tax	4.126329	2	0.1271
EmpIT	14.83879	2	0.0006
All	17.50309	4	0.0015

Source: received and compiled by the author

The results confirmed the influence of factors on companies' annual turnover with a simultaneous impact. According to the results obtained, suppose the hypothesis is rejected at 5%. In that case, it is noted that tax rates and the number of workers involved in the technology segment affect the size of the annual turnover of IT-companies. It should be noted that in addition to the general effect, the results obtained confirm the previously obtained results for each group of factors separately. In preliminary analyzes, taxation rates did not have the character of influence on the annual turnover, which is confirmed in the results obtained: the value of p-statistics alone is not enough, but influence exists in the system of factors.

From here, it is possible to present the final model for the annual turnover of technology companies. The study period is 2008–2020.

$$\text{Turnover IT in Bulgaria} = -5.65e{+}03 - 5.11e + 03\text{Tax} + 0.130\text{EmpIT} \quad (3)$$

The final model for the IT segment in Bulgaria notes the dependence of companies' annual turnover on the tax rate and the number of employees in companies. As for the tax factor, there is an inverse relationship concerning the dependent change: a decrease in the rate will improve financial results. The number of company employees reflects a direct relationship between indicators: an employee increase will lead to improved company results. With reverse dynamics, the effects will be reversed. According to p-statistics, the number of employees and the negative value of the constant are the most influential. As noted earlier, tax rates have less influence, which is associated with stable values (but low) of corporate tax and payroll tax rates. According to the indicators of adequacy and likelihood (R^2, p-statistics for the model, and log-likelihood), the model has the right to exist.

Results and conclusion. The conducted research shows that the economic efficiency of the components of the IT segment company depends on and is influenced by factors related to both external and internal. The groups of factors studied for two representatives of the CEE region were chosen as theoretically influential factors. The factors of the tax burden, educational component, and labor force are theoretically meant as indicators that can influence the development of the IT segment since most of the companies belonging to the technology representatives are representatives of SMEs. Small companies are more strongly subject to external factors and shocks than large ones.

Identifying the factors allows companies to improve their stability results and counteract economic instability in the world. Companies in the IT sector have been among the leading players over the years of the last years. Identifying factors allows managers to pay attention to their growth factors, allowing companies to grow and remain stable in years of economic fluctuations, confirmed by the last twenty years. Hence, identifying the influential factors will allow for building a valid growth policy both at the level of companies and at the level of states to maintain the economy's performance over time. Consequently, it was studied in more detail factor groups of influence on the effectiveness of companies, and the following results were obtained.

The final model of the influence of factors studied for Hungary made it possible to note the most optimal consistency when combining tax rates and the number of workers in ITC sector. However, the resulting model is only one of the final ones for the country in the search for influential factors since there are specific problems with one of the model adequacy indicators. Hence, there is a need and opportunity to continue the study of this topic and search for the most influential factors on the economic performance of Hungarian technology companies to create a more optimal space for their existence. In Bulgaria, the final model is optimal and allows noting the dependence of the annual turnover of technology companies on tax rates and the number of employees in companies. The data obtained allow to consider this feature of companies' dependence if they want to attract more foreign companies to the country or further develop the IT segment as a whole. However, it should be noted that the indicators not selected in the final model for Bulgaria from the educational component group also need to be addressed and improved by the state policy. Their lack of influence can be explained by the lack of dependence between indicators and somewhat leveled changes (low growth). This area needs further, broader research, considering a more extended period.

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ФАКТОРИ РОЗВИТКУ ІТ-СЕКТОРУ В УМОВАХ ЕКОНОМІЧНОЇ НЕСТАБІЛЬНОСТІ: ПРИКЛАД УГОРЩИНИ ТА БОЛГАРІЇ

Метою статті є визначення основних факторів, що впливають на економічний показник ефективності ІТ/ІТК компаній в Угорщині та Болгарії. Актуальність підтверджена тим, що у період фінансово-економічної нестабільності визначення факторів розвитку компаній дозволяє зрозуміти найбільш сприятливі сценарії розвитку для подальшого впливу на зростання економічних показників в країні. У статті представлено результати дослідження залежності річного обороту ІТ-сегментів Угорщини та Болгарії від визначених специфічних груп факторів. Для цього у дослідженні було проведено аналіз для визначення найбільш впливових груп для кожної країни окремо. У статті представлено аналіз ІТ/ІТК секторів Болгарії та Угорщини з точки зору економічної ефективності та кількісного показника компаній в цілому. Представлено показник розміру компаній для кожної з країн. Даний показник розглядається з точки зору кількості співробітників, що залучені в компанії та розподіляється на: мікро, малі, середні та великі компанії. Основним показником фінансової ефективності компаній для обох країн був річний оборот компаній. Три основні сфери впливу були класифіковані як групи впливу: податкові ставки, показники освітньої складової та показники робочої сили. Податкові ставки розглядалися за трьома основними типами: корпоративний податок, податок на заробітну плату та соці-

альні внески. Досліджено їх зміни протягом періоду понад десять років. Представлено зміну ставок соціальних сплат порівнюючи їх розмірність для робітників та роботодавців. Освітня складова як група факторів була поділена на дві підгрупи: кількісні характеристики студентів, випускників та витрати на освіту. Витрати на освіту розглядались за двома підгрупами: витрати на освіту по країні загалом та витрати на вищу освіту. Група факторів робочої сили базувалася на аналізі кількості працівників у сфері IT/ITK та витрат на персонал на рівні компанії. Витрати на персонал представлені через загальні витрати компаній на робітників, а також у вигляді середньої заробітної плати по сектору. На основі економетричних аналізів і тестів (наприклад, тесту Грейнджера) були виведені системи факторів, що впливають на показник ефективності діяльності технологічних компаній в Угорщині та Болгарії.

Ключові слова: *товарообіг, IT-сектор, податкові ставки, робоча сила, витрати на освіту, фактори впливу, IT-центр, IT-спеціалісти, дохід.*