

FACTORS IMPACTING INVESTMENT DECISIONS IN ICT INDUSTRY

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The article analyzes the main factors influencing investors' decisions on the advisability of investing capital in companies in the information and communication technology industry. The present article's relevance lies in identifying the main investment objectives that determine investment decisions in innovative sectors of the economy which comprise security, growth and stable income and in identifying the most impacting factors on investment attraction in the ICT industry in a number of developed and developing European countries, the main factors being: political stability, legal environment, investments attraction policies; taxation; infrastructure development, level of country digitalization, science and technology; workforce, competitiveness in terms of cost and productivity.

Keywords: *investment decisions, factors impacting investments, company information and communication technology.*

FACTORI CU IMPACTUL DECIZIILOR DE INVESTIȚII ÎN INDUSTRIA TIC

Articolul analizează principalii factori care influențează deciziile investitorilor cu privire la oportunitatea investiției de capital în companiile din industria tehnologiei informației și comunicațiilor. Relevanța articolului dat constă în identificarea principalelor obiective de investiții care determină deciziile de investiții în sectoare inovatoare ale economiei care includ securitatea, creșterea și veniturile stabile și în identificarea factorilor cu cel mai mare impact asupra atragerii investițiilor în industria TIC în careva țări dezvoltate și țări europene în curs de dezvoltare, cei mai importanți factori fiind: stabilitatea politică, mediul juridic, politicile de atragere a investițiilor; impozitare; dezvoltarea infrastructurii, nivelul de digitalizare a țării, știință și tehnologie; forța de muncă, competitivitatea în termeni de cost și productivitate.

Cuvinte-cheie: *decizii de investiții, factori care influențează investițiile, tehnologia informației și comunicațiilor companiei.*

Introduction

The current stage of economic development in both developed and developing countries is determined by the need to modernize structures, forms, methods of organizing economic activity, and transform methods of stimulating business activity in the state. In the context of the sharp growth of digital technologies, the creation of a competitive economy requires the development of its most innovative sectors first. Increasing investment activity is a necessary condition for solving this problem, which is achieved by increasing the volume of attracted investment resources and their most effective use in the highest priority areas of production. In this case, investments contribute to the formation of production potential on a new scientific and technical basis, which predetermines the strengthening of competitive the country's position at the global level.

The experience of recent decades shows that in most countries, despite the active involvement of existing reserves and opportunities to attract investments in the domestic market, the available resources are not sufficient to solve the ambitious tasks that were set, which makes it necessary to search for funds in foreign markets. Attracting foreign investment brings with it many positive aspects: foreign capital expands the country's financial capabilities, brings with it new technologies, a modern business culture, etc. However, solving the problem of attracting investments both in the domestic and foreign markets, as well as their optimal distribution, requires the creation of favorable conditions for investment activity, which makes us think about the factors influencing the decision of capital owners to invest in a particular country. Obviously, the determining factors in this matter are several economic and political factors, the level of institutional development of the country as a whole and a few other qualitative and quantitative indicators. Therefore, the issues of creating a favorable investment climate that facilitates the adoption

of positive investment decisions, the conditions and factors of its formation, are relevant today, which determines the need for this study.

Applied Methods and Sources of Information

The investigation presented in this article was implemented based on such research methods as: general-scientific methods of cognition, logical analysis of theoretical and practical materials, documentary method, analogy and grouping of quantitative and qualitative data method, graphical method, method of synthesis and comparative analysis method. The analysis is grounded on the data obtained from European Commission, Eurostat, United Nations Conference on Trade and Development, official websites of governments and central banks of the European countries, etc.

Literature Review

The search for mechanisms for attracting foreign direct investment in modern conditions of fierce competition both at the national and international levels is an urgent problem, and therefore there are many studies dedicated to the analysis of factors that contribute to the creation of favorable conditions that facilitate the adoption of positive investment decisions by potential investors. Identification factors that are significantly associated with financial decision-making are relevant and are some of the crucial issues for investment attraction [20].

Researchers Y. Hartini, N. Suarmanayasa et al., analyzing factors impacting investment decisions, identified three main investment objectives of potential investors: security, growth, and income. The authors concluded that initially, in making investments investors used estimates of the prospects of investment instruments/products and psychological factors that became *internal factors* that determined the investment. In addition, there are *external factors* in determining an investor's investment decision, including regulation by policymakers (government), and information technology, which is currently developing very rapidly [15]. Kang, J. Xing et al., analyzing influencing factors of investment, identified similar main groups of determining factors, but as *internal factors* they called: behavior factors, company's performance and risk in the investment decision, and as *external factors* the authors defined government policy, within which they distinguish different economic policies, such as macroeconomic policies and globalization policies, and environmental factors [10].

In A. Avatesyan's study, the following factors influencing the investment attractiveness of a country were identified: market size, degree of urbanization, level of human capital development, level of economic integration, trading regime, labor costs, exchange rate volatility, political stability, etc. An analysis of investment attractiveness factors influencing investment decisions, conducted by S. Tocar, revealed the positive impact of market size and the level of infrastructural development and the negative impact of wage levels, corruption, income tax rates and political risks. A study of the evolution of FDI based on econometric calculations for the long term in African countries, conducted by P. Jaiblai and V. Shenai, revealed a significant positive impact on these calculations caused by inflation and infrastructure and an insignificant but positive impact due to changes in the exchange rate and the degree of openness of the economy, as well as a negative impact income level and market size [12]. An empirical study made by Basemera et al. found corruption, inflation, openness of economy and GDP per capita as determining factors of investment inflows in Africa. A study conducted by Kaliappan et al. in ASEAN countries revealed that human capital, infrastructure, trade openness and market size affects investment inflow positively with negative effect of inflation [14]. The research results of V. Ta, A. Duc Do et al. identified, that in Vietnam FDI attraction policies have the strongest impact on the investors' FDI intentions; infrastructure, public services and human capital have the following strong effects on intentions of investors' FDI, and finally, the standards of living that affects the investors' FDI intentions [16].

Results and Discussions

The factors considered by foreign investors when making investment decisions are influenced by the features of industry for investments. Taking into consideration the specific of ICT sector, and its independ-

ence from the presence of natural resources, the value of the quality of suppliers, as well as delivery chains, the following main factors that impact investment decisions and matters for FDI attraction in innovative industries can be determined as follows:

- political stability, legal environment, FDI attraction policies;
- infrastructure development, level of country' digital transformation, innovation, science and technology;
- taxation;
- human capital, skilled workforce and talent pool;
- competitiveness in terms of cost and productivity;
- productivity of the analyzed sector, etc.

Considering that the factors belonging to the first group are not a topic for study in this work, we will begin the study by considering such prerequisites as infrastructure development, level of the country' digital transformation, innovation, science and technology (Table 1).

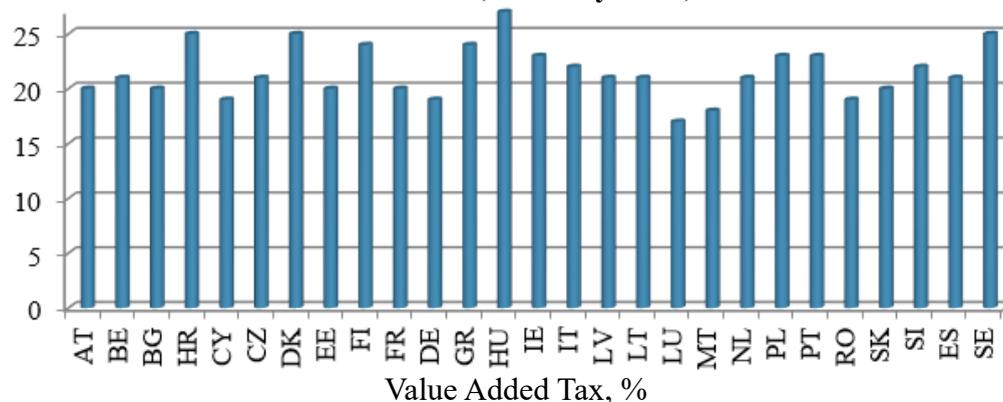
The results of the study demonstrate that among the countries examined, the lowest level of technological development was registered in the Republic of Moldova, and a fairly low level was also detected in Ukraine and Serbia. Germany and Austria show the highest level of technological development. Prerequisites for the development of innovative sectors, including the ICT industry, are best represented in the UK, France, Germany and Austria, where the appropriate infrastructure, high level of human capital and research, knowledge and technology outputs and institutions have been created. Among European countries, the Republic of Moldova, Serbia and Ukraine have been the least successful in preparing infrastructure, institutions and businesses for the implementation of ICT.

Table 1. The level of country' digital transformation.

	Austria	France	Spain	The U.K.	Bulgaria	Germany	Hungary	Moldova	Romania	Serbia	Slovakia	Ukraine
Technology and innovation index	24	15	21	17	43	7	36	82	45	50	39	58
ICT ranking	39	18	8	20	45	24	14	53	32	51	27	61
Skills ranking	29	24	28	12	52	17	43	97	69	54	49	42
R&D ranking	25	8	14	6	54	5	48	93	33	58	37	49
Industry ranking	28	17	34	44	36	12	14	70	38	43	27	85
Finance ranking	36	24	24	12	81	40	99	117	122	89	61	114
Global Innovation index	18	11	29	4	38	8	35	60	47	53	45	55
Institutions	13	27	46	24	66	22	47	96	74	57	65	100
Human capital and research	11	17	27	8	66	4	36	67	75	51	53	47
Infrastructure	12	22	16	6	28	23	42	75	34	35	41	77
Market sophistication	39	9	33	3	60	14	64	76	75	41	72	104
Business sophistication	19	17	32	13	42	16	30	101	51	68	47	48
Knowledge and technology outputs	17	16	24	7	34	9	26	60	35	41	31	45
Creative output	13	6	29	2	34	7	38	42	58	92	56	37

Source: developed by author based on [18, 19].

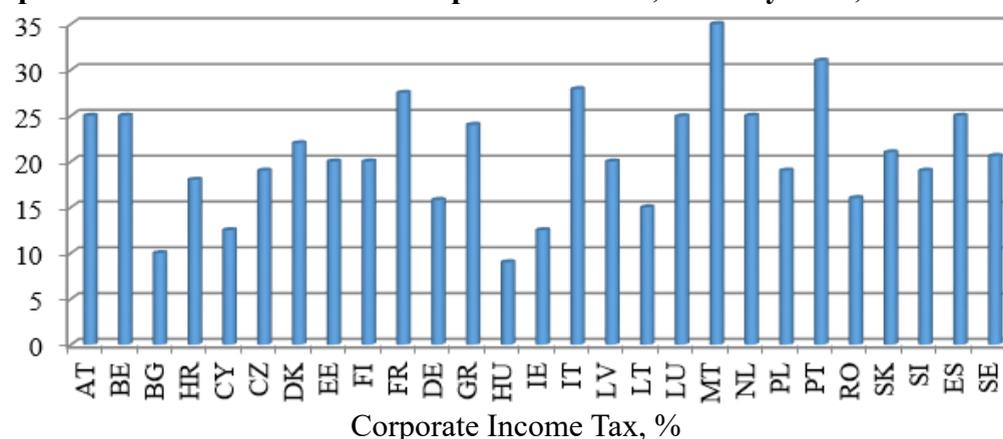
The tax systems in European countries, in particular the value added tax (VAT) and corporate income tax, largely reflect historical trends, preferences for the development of certain sectors of the economy, protection of the interests of the socially vulnerable segments of the population, etc. and, as a result, significantly differ from each other (figure 1).

Fig. 1. Value added tax rates in EU countries, January 2023, %.

Source: developed by author based on [26].

The lowest standard VAT rates among EU countries were registered in Luxembourg - 16% and Malta - 18%, also favorable for foreign investors standard VAT rate - 19% is set in Cyprus, Germany, Romania. The highest VAT among European countries is registered in Hungary - 27%, a significant VAT rate is also registered in Denmark and Sweden - 25%. In most other EU countries, VAT rates hover around 20%. In particular, such VAT rates are set in France, Great Britain, Austria, Bulgaria, In Germany VAT is 19%.

The minimum tax rates on corporate income in EU countries were registered in Hungary - 9%, in Bulgaria - 10%, in Cyprus – 12,5% (figure 2).

Fig. 2. Corporate income tax rates in European countries, January 2023, %.

Source: developed by author based on [27].

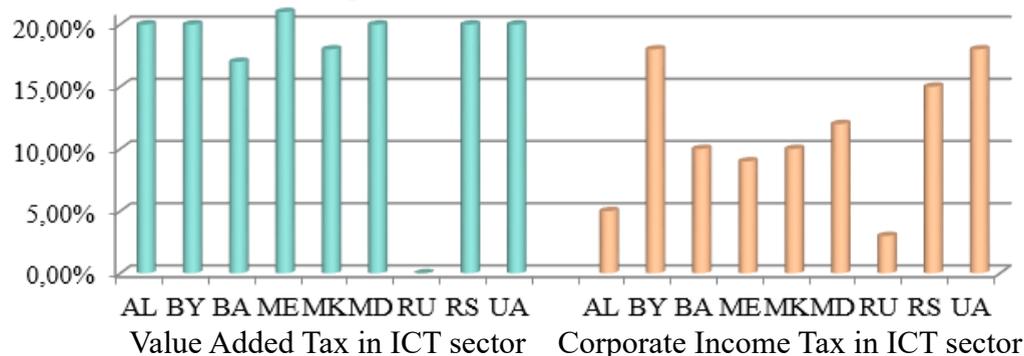
The highest level of tax rates on corporate income registered in Portugal – 31,5%, in Italy – 27%, in Germany it is more than 29%, in Spain, France, Netherlands it is about 25%.

The system of corporate income tax rates in EU countries may be quite complex, and tax rates differ in dependence of company' turnover, the date of its registration as it is in France, in some countries it comprises some parts, for example, in Italy it includes corporate income tax and regional production tax. In some EU countries were introduced special regimes of taxation for some services and products from ICT sector.

In many analyzed non-EU countries, COVID-19 pandemic initiated a revision of taxation in ICT sector and were created different schemes and possibilities to decrease the costs on providing ICT services through minimization of taxation (fig. 3).

For example, in Serbia the standard VAT rate is 20%, but a reduced VAT rate of 10% applies for some goods and services. In Belarus the standard VAT rate is 20%, telecommunication services often are subject to VAT at the rate of 25%, but an IT company working with Belarusian contractors can use a simplified system without paying VAT and pays only taxes: 5% of turnover; payroll taxes.

Fig. 3. The rates of taxation of companies from ICT sector, %.



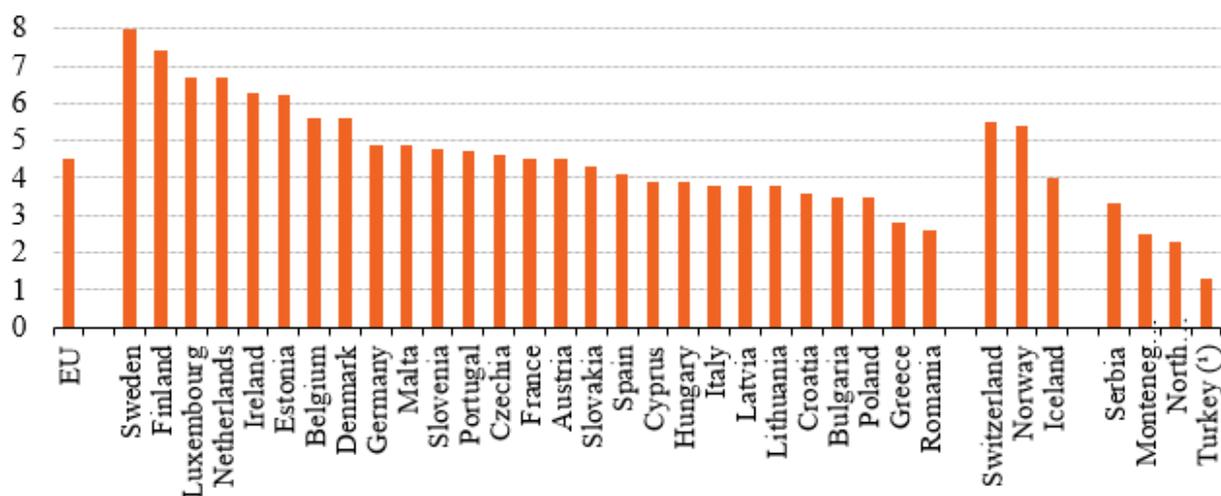
Source: developed by author based on [1, 3, 4, 5, 7, 8, 13, 21, 25, 28].

In Ukraine, in a single-tax model, typical for the IT industry (engagement professionals as individual entrepreneurs), tax of income of the IT professional is 5% or it is 3%, if the IT is registered as a VAT payer. Within the classic employment model, personal income tax is 18%, military tax is 1,5%, the tax base for USC is 22%. In Russian Federation, starting from 2021 through „IT tax maneuver” law the IT corporate tax rate was decreased to 3%, social security tax rate was reduced to 7.6%. Benefits were introduced for legal entities with 90% of revenue from software production. From 2022, in IT sector, corporate tax rate was decreased to 0. Standard VAT (20%) may be exempted, if produced software products are included under the „unified register” of programs for computers and databases, but it does not apply to advertising-related software.

In Republic of Moldova, for residents of Moldova Innovation Technology Park is applicable 7% flat tax on turnover – which is to replace: corporate income tax, personal income tax, social security, medical insurance taxes, etc. Starting from 2022, the e-book production, audio and electronic periodicals publications, audio, editing services, etc. are VAT exempted supply without deduction right.

Availability of human capital, skilled workforce and its cost are other important factors that influence on attraction of investors in industry (figure 4).

Fig. 4. Proportion of ICT specialists in total employment, 2021, (%).

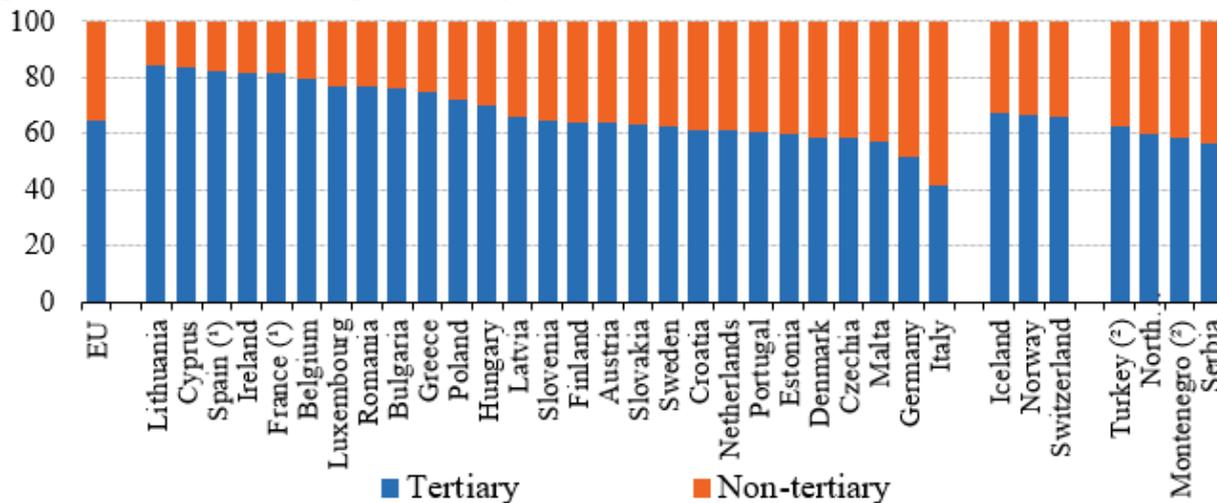


Source: developed by author based on [22].

The most significant share of ICT specialist in total employment is registered in Sweden, where it is around 8%, in Finland this share is 7,3%, in Luxembourg and Netherlands it is 6,8%. In non-EU countries the highest level of ICT specialist in total employment is registered in Serbia, where it is more than 3%.

Among analyzed countries, the highest level of ICT specialist’s qualification was registered in Lithuania, Cyprus, Ireland and Spain (figure 5).

Fig. 5. Distribution of ICT specialists by education attainment level, 2021.

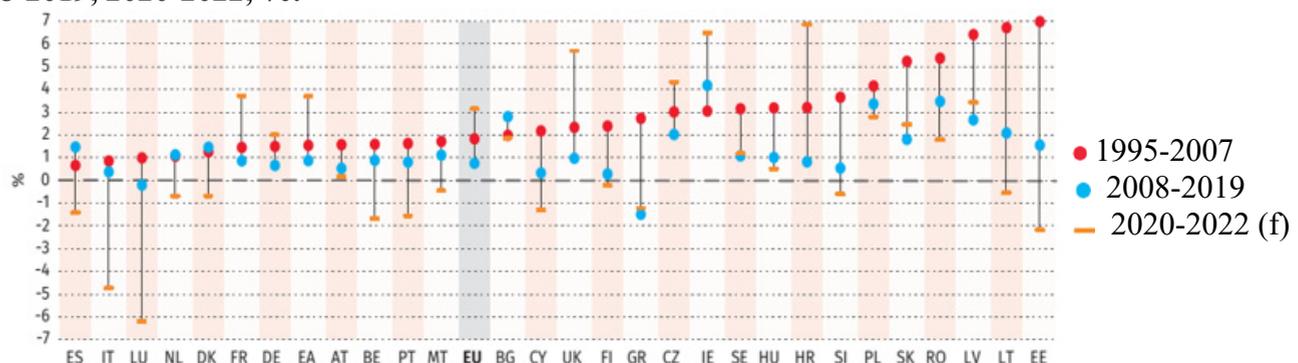


Source: developed by author based on [22].

In Albania, there are 35.000 employed in the ICT-BPO sector. The average annual labor cost in Information and communication sector is around \$10,000. In *Belarus* the number of ICT specialists is 118,778, which is 3.2% of the total employees. The total number of employees in the information and communication technology services sector in Bosnia and Herzegovina – 18500 person. A person working in Information Technology in Bosnia and Herzegovina typically earns around \$1300 per month. Salaries range from \$690 to \$2150. In Ukraine, number of ICT specialists (IT+telecom) is 289 thousand persons, number of ICT graduates persons per 100 thousand of population – 68 persons. The project manager’s medium salary is about \$3000, the software engineer – \$2800, QA automation – \$2500, QA manual – \$2000. Number of registered IT legal entities is 18600. The total number of entities in the information and communication sector 1399, or 3.8% of the total number of business entities in Montenegro. The average gross monthly fixed employees’ salaries: computer programming - \$986, information service activities - \$601, telecommunications - \$1675. In Russian Federation number of employees in the ICT industry is 1240 thou. People working in IT and wholesale of ICT-related goods segments earned a monthly salary worth \$1430 on average. In the Republic of Moldova number of employees in the ICT industry is 30500 persons, including 16500 IT professionals, which activate in 2400 IT companies. Average wages in IT sector is \$1700 per month, including Software Engineer – \$2200, IT Project Manager – 2200+ EUR, Database Administrator – \$1450.

The productivity of the analyzed sector in many developed EU countries, as well as in average at the EU level in 1995-2019 demonstrated insignificant volatility. In 2020-2022, in many EU countries, the productivity decreased, but in France, Great Britain, Czech Republic, Croatia, Ireland, etc. it demonstrates growth (figure 6).

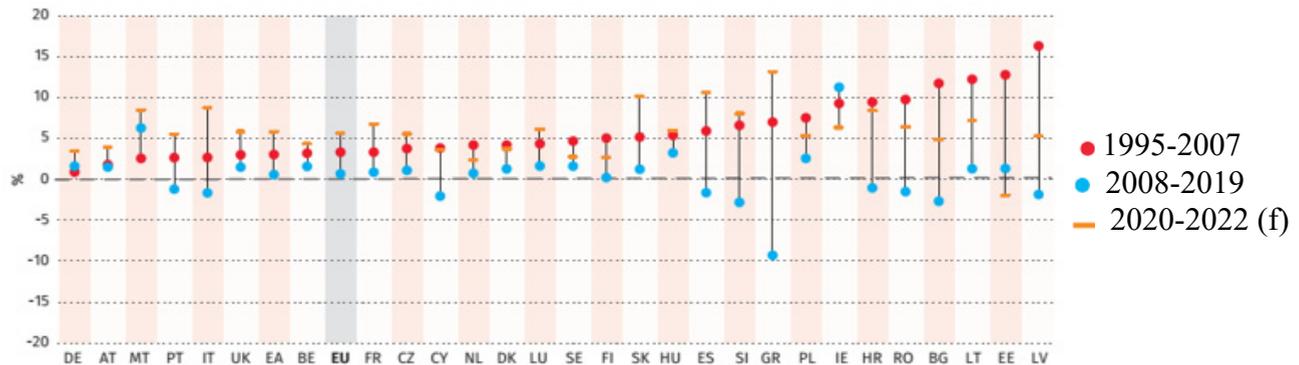
Fig. 6. Average annual growth rate of hourly labor productivity, EU Member States, 1995-2007, 2008-2019, 2020-2022, %.



Source: developed by author based on [23].

In 2020-2022, the average annual growth rate on real gross capital formation (investment) in many EU countries increased and it indicates the existence of positive expectations of the prospects for future economic growth and it is a motivating factor for potential investors in investments decision process (figure 7).

Fig. 7. Average annual growth rate of real gross capital formation (investment), EU Member States, 1995-2007, 2008-2019, 2020-2022, %.



Source: developed by author based on [24].

The most significant increase in real gross capital formation was registered in Italy, Poland, Austria, France, Slovakia, Spain, Greece, etc. Germany, Great Britain, Belgium, and Portugal also demonstrate positive dynamics.

An analysis of the evolution of the number of projects being implemented on the European continent among the 15 countries, which are most successful in attracting foreign investment, shows a solid leadership of France, Great Britain and Germany. In addition, the top positions are occupied by the most economically developed countries – such as Spain, Italy, Belgium, etc. (table 2).

Table 2. Top 15 countries in terms of FDI projects in Europe in 2020-2022.

Rank	Country	2020	2021	2022	Change 2020/2021	Change 2021/2022
1	France	985	1222	1259	24% ↑	3% ↑
2	The U.K.	975	993	929	2% ↑	-6% ↓
3	Germany	930	841	832	-10% ↓	-1% ↓
4	Spain	354	361	324	2% ↑	-10% ↓
5	Turkey	208	264	321	27% ↑	22% ↑
6	Belgium	227	245	234	8% ↑	- 4% ↓
7	Italy	113	207	243	83% ↑	17% ↑
8	Portugal	154	200	248	30% ↑	24% ↑
9	Poland	219	193	237	-12% ↓	23% ↑
10	Ireland	165	152	184	-8 ↓	21 ↑
11	Netherlands	193	151	147	-22% ↓	-3% ↓
12	Finland	92	124	104	35% ↑	-16 % ↓
13	Austria	76	103	101	36% ↑	-2% ↓
14	Serbia	na	73	74	na	1% ↑
15	Romania	na	37	69	na	86% ↑

Source: elaborated by the author based on EY European Investment Monitor 2022, 2023.

Each of these countries is characterized by a high level of infrastructure development, level of country' digital transformation, innovation, science and technology, human capital, skilled workforce, etc. Although

these countries often offer less favorable tax conditions and more expensive labor in the ICT sector than developing countries in the region, decision making by foreign investors regarding investments in ICT companies is largely more positive for these countries. It is also impossible to skip the significant influence on decision making by foreign investors of such factors as political and economic stability. For example, Russia, which in 2020 ranked twelfth among the most successful countries in attracting investments with 141 projects, and Hungary, which in 2021 ranked fifteenth with 76 projects, dropped out of the list of leaders in attracting FDI.

Conclusions

Ensuring sustainable economic growth of any European country directly depends on its ability to actively involve existing internal financial reserves and capabilities, as well as FDI, in the development of the national economy. A study of theoretical research by foreign scientists has revealed the presence of different views on the identification of determining factors that contribute to the adoption of positive investment decisions in various sectors of the economy. Attracting investment in the ICT industry has its own specifics, determined by the characteristics of the sector. The study of the experience of several European developed and developing countries, carried out in this article, made it possible to identify the main ones: political stability, legal environment, FDI attraction policies are important factors when making investment decisions, both for domestic and foreign investors; infrastructure development, institutions, level of the country's digital transformation, innovation, science and technology are among the determining factors for most investors in the investment decisions making process; taxation is an important factor for investors, but not a determining one, since most European developing countries, including the Republic of Moldova, have created tax conditions in the ICT industry that are attractive to potential investors, which do not always receive a strong enough response in the form of increased investment in the industry; human capital, skilled workforce and talent pool are quite significant factors stimulating the growth of positive investment decisions in the ICT industry, and their mutual influence is observed, since the growth of investments in ICT, in turn, stimulates the growth in the number of educational institutions and programs training ICT specialists; competitiveness in terms of cost and productivity, productivity of the analyzed sector are quite significant factors stimulating the growth of positive investment decisions in the ICT industry.

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