The investment attractiveness of countries: coupling between core dimensions

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Abstract

Ongoing economic development provokes the intensification of competition on the global market, requiring developing countries to offer affordable conditions for attracting new labour and financial resources. At the same time, foreign investors and skilled labour forces focus on countries with a high level of investment attractiveness. The paper aims to estimate the coordination and degree of coupling between the dimensions of investment attractiveness, defining the internal and external dimensions of investment attractiveness in order to do so. The internal dimensions included five groups of indicators: socio-economic, infrastructural, innovation/research, energy resources, and agricultural dimensions. Based on entropy methods, the authors developed an approach to assessing the degree of coupling between the core dimensions of investment attractiveness. The countries which were the subjects of the investigation for the period of 2000-2020 were Bulgaria, Croatia, Lithuania, Latvia, Romania, Poland, and Ukraine. The analysed data was obtained from the World Data Bank. The findings showed that Bulgaria, Croatia, Lithuania, Latvia, and Romania had the highest degree of coupling of integrated investment attractiveness in 2018-2020, Poland in 2018, and Ukraine in 2008. The results of pairwise and integrated assessment of coordination and interconnection between the core dimensions of investment attractiveness allowed for the identification of both positive and negative trends in the change thereof, justifying the governmental policy of increasing investment attractiveness.

Key words

investment, coupling, coordination, sustainable development

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Introduction

The intensification of globalisation processes provokes increased competition for labour and financial recourses (the foundation of long-term economic development) on the global market. Stakeholders (investors, tourists, labour, etc.) choose countries with a favourable investment climate and a high ranking on the worldwide scale. The snowball effect of the pandemic has provoked a decline in economic growth, and consequently a decline in the investment attractiveness of countries. Developing countries felt the adverse effects and economic shock of the pandemic more than developed countries (Smiianov et al., 2020; Kuzmenko et al., 2020; Lyeonov et al., 2021). It provoked an outflow of stakeholders and capital from countries and, as a result, limited the pace of economic growth. Besides, some studies (e.g. Bilan et al., 2020; Chygryn et al., 2018; Zolkover et al., 2020) confirmed that developing countries had fewer options than developed countries when it came to accumulating additional financial resources in order to overcome the ongoing economic, social and health issues.

Considering the Global Sustainable Competitive Index (The Sustainable Competitiveness Report, 2021), the top five leaders were Sweden, Finland, Switzerland, Denmark, and Norway. It should be noted that the newest EU members did not rank among the first 10 countries – Poland occupied 35th place, Czechia 26th, Hungary 36th and Slovakia 23rd. In this case, the latest potential candidates for EU membership (e.g. Ukraine) should implement a coherent policy of economic development corresponding to the best EU practices (leading nations in the Global Sustainable Competitive Index).

Furthermore, a vast range of factors influenced the attractiveness of a given country. Studies by Zolkover and Terziev (2020) and Rathnayaka Mudiyanselage et al., (2021) proved that the financial system and the openness of the economy affect countries' attractiveness to foreign investors. Saturwa et al., (2021), Lestari et al. (2021), Holobiuc (2021) and Chygryn et al., (2018) defined the economic and social factors which influenced the attractiveness of a country. From another point of view, researchers such as Fu et al., (2021), Yemshanov et al., (2005) and Pan et al., (2019) proved that countries with significant ecological issues and low levels of energy security were not attractive to foreign investors.

The above means that countries should analyse which dimensions provoked the decline and what may allow them to increase their level of investment attractiveness. Besides, the impact of combinations of factors should be considered as part of the investment policy and economic growth of developing countries. In this case, it is necessary to understand which dimensions of a country's investment attractiveness brought about the increase or, by contrast, the decline thereof. At the same time, the government should consider the relationship and coordination between the core dimensions of the investment attractiveness of a country. Thus, the paper aims to: i) estimate the investment attractiveness of a country; ii) identify dynamic trends in the change in the degree of coupling between the dimensions of the investment attractiveness of a country.

The paper is structured as follows: firstly, the introduction describes the importance of the investigation; the literature review contains an analysis of the scientific background in investigations of the investment attractiveness of a country to justify the aims of the paper; the methods and methodology section contains explanations of the methodology used to achieve the aforementioned aims; and the results section features empirical findings pertaining to the investment attractiveness of a country, as well as the degree of coupling between the core dimensions of said investment attractiveness. Finally, the paper

concludes with a discussion of the findings, a comparison with previous research, and the suggestion of ways to increase the investment attractiveness of countries.

1. Literature review

In international business research, investment attractiveness was analysed as a component of the competitiveness of countries or as the result of the development of sectors, companies, and institutions (Christiansen, 2004). Thus, the concept of investment attractiveness was used to measure the characteristics of a given country which allowed it to attract international investors such as multinational enterprises and multinational corporations, agricultural holdings, etc. The assessment of investment attractiveness is a complex process with a vast range of iterations. Saturwa et al., (2021) highlighted the fact that the range of dimensions that impacts the investment attractiveness of a country depended on the country and its development priorities. Jantoń-Drozdowska and Majewska (2016) analysed the investment attractiveness of a country as a set of advantages and shortcomings of an investment location. Hildebrandt et al., (2013) reached similar conclusions. At the same time, they proved that the explanatory variables of investment attractiveness depend on the sectoral structure of the country, its business internalisation strategy, and so on. Lee (2016) generalised the theoretical approach to the assessment of the investment attractiveness of a country, allocating three core dimensions thereof: 1) economic; 2) social; and 3) environmental. The results of the analysis showed the existence of different approaches to an assessment of the investment attractiveness of a country. In general, investment attractiveness involves two aspects which may be part of such an assessment: 1) the country's ability to attract new resources – the external dimension; 2) the country's ability to effectively use the available resources following the vectors improving the investment attractiveness of a country – the internal dimension. Thus, in general, the effective use of available resources relate to economic and social development, the infrastructure of a country, innovation and research development, energy, and agricultural resources.

1.1 Investment attractiveness and external determinants

A significant amount of research has confirmed that the financial system is a core element of the investment attractiveness of countries. In this vein, Leonov et al. (2012) confirmed that an effective financial system and attractive conditions for co-investment funds led to an increase in the investment attractiveness of a country. Besides, research (Leonov et al., 2012; 2014) has justified the necessity of developing and supporting the financial markets of a country, which in turn allows countries to increase their investment attractiveness and attract new foreign direct investment. A similar conclusion was reached by Toyin and Oludayol (2020). Studies by Zolkover and Georgiev (2020), Zolkover and Terziev (2020), and Bilan et al., (2020) showed that the shadow economy provoked a decline in the investment attractiveness of a country. Consequently, this led to an outflow of foreign direct investment. Zolkover and Georgiev (2020) applied regression analysis and the Brown-Robinson method to justify the hypothesis that the decline in the shadow economy allowed for increased foreign direct investment. According to the findings of Leonov et al., (2019) and Levchenko et al., (2019), money laundering negatively impacted the attractiveness of a country to foreign direct investment. Studies by Formankova et al., (2018), Vorontsova et al., (2020) and Yelnikova et al., (2020) proved that transparency, the legislation base and the education dimension impacted the attractiveness of a country to responsible investors. Windhyastiti et al., (2021) applied multiple regression analysis to achieve the

aims of the paper, namely to identify the core dimensions which influenced investment attractiveness. According to the findings of Windhyastiti et al. (2021), dimensions such as legislation had the greatest statistically significant influence on the investment attractiveness of cities among the analysed indicators. At the same time, Rathnayaka Mudiyanselage et al., (2021) confirmed the statistically significant negative effect of trade openness on the investment attractiveness of a country from both short-run and long-run perspectives. The opposite conclusion was drawn by Lien (2021) in the case of Vietnam: the study applied the vector autoregression (VAR) model to confirm the statistically positive effect of trade openness on the attractiveness of a country to foreign direct investment. Similar findings for BRICS countries were obtained by Banday et al., (2021). Such different findings justified the necessity of considering trade openness as part of the investment attractiveness of a country. It should be noted that Usmani et al., (2021) confirmed that investment policy should consider the current tourism infrastructure. Using the causality test and panel data, they confirmed the positive impact of tourist expenditure on economic growth (based on the example of Russia, China, India, and Brazil for 1995-2016) and the investment climate in the country. Rahman and Hassan (2021) confirmed that a well-developed tourism sector led to the increased investment attractiveness of a country, and thus economic growth.

1.2 Investment attractiveness and the economic and social development of countries

Based on the example of Indonesia, Saturwa et al., (2021) confirmed that stakeholders invest in countries with a strong economy. Investors are oriented towards the Global Sustainable Competitive Index when making investment decisions. Furthermore, Alrakhman and Susetyo (2022) proved that the investment rate positively correlated with economic growth on the island of Sumatra for the period of 2015-2020. At the same time, they confirmed that the unemployment rate and inequality negatively affected economic growth, and consequently investment attractiveness. However, Lestari et al., (2021) concluded that the investment attractiveness of a country affected its competitiveness on the global market, as well as confirming the mediating role of economic growth among the human development index, investment, and the unemployment rate and poverty. Janton-Drozdowska and Majewska (2016) confirmed that investment attractiveness was part of the competitiveness of a country, for example in Central and Eastern Europe. Their investigation was based on the Foreign Direct Investment Index for 1995-2013 and applied Pearson's linear correlation. Kaya and Kwok (2020) identified the core investment parameters and their impact on the social and economic development of countries. Chrzonstowski (2021) confirmed the hypothesis that countries with the lowest labour costs were more attractive to investors. He developed a model based on labour and capital and confirmed that, among Visegrad countries, Slovakia had the highest level of investment attractiveness, followed by Czechia, Hungary, and Poland. For EU countries, Holobiuc (2021) justified the partial convergence between economic growth determinants, which provoked the decline of trust in the EU and investment attractiveness for foreign stakeholders. Studies by Samusevych et al., (2021), Vasilyeva et al., (2016), Chygryn et al. (2018), Bondarenko et al., (2020) and Akimov et al. (2020) confirmed the convergence between social, economic, marketing, and financial determinants which affect the competitiveness and investment attractiveness of countries. Mihaylova (2020) analysed the investment attractiveness of 15 Central, Eastern, and South-Eastern European countries for 2013-2017. Mihaylova (2020) focused on foreign direct investment, government pol-

icy efficiency, productivity and labour cost. Considering the findings, Estonia had the highest level of investment attractiveness among the countries analysed.

1.3 Investment attractiveness and the infrastructure of countries

Based on the concept of endogenous growth, Dimian and Danciu (2011) allocated the core dimension of the competitiveness of a country in terms of investment attractiveness: infrastructure quality; expenditure on information and communication technologies; research and development costs; and economic policy instruments that contribute to the intensification of entrepreneurial research and knowledge accumulation. Dorozyński and Kuna-Marszałek (2016) applied Pearson's linear correlation and Spearman's rank correlation coefficient in an analysis of the investment attractiveness of the Visegrad countries. They analysed investment attractiveness as a proxy for the competitiveness of a country. The analysed variables were chosen based on an analysis of worldwide indexes which estimated the competitiveness of a country. The research results confirmed that, in order to increase investment attractiveness, the country should: develop infrastructure; develop a favourable business climate; create an understandable legislation base for stakeholders; and offer financial and non-financial government support. Besides, Usmani et al., (2021) highlighted the fact that investment policy should be improved by developing a country's infrastructure, particularly its transportation network and telecommunication capabilities. At the same time, Chauke and Ncanywa (2021) justified the positive impact of investment on the development of infrastructure in South Africa. Alam et al., (2021) showed that economic development and investment attractiveness depended on the development of transportation infrastructure. By using ARDL and VEC models, they confirmed the relationship between transport networks and economic development. The relationship had long-run unidirectional causality.

1.4 Investment attractiveness, research and innovation

Based on the example of Belarus, Hrechyshkina and Samakhavets (2018) highlighted the role of foreign direct investment in the innovation development of that country, which was the core element of the investment attractiveness of the country. In the digitalisation era, with development boosted by the pandemic, IT technologies and the readiness of a country to implement them impacted investment attractiveness. Bruneckiene et al., (2019) proved that digital and smart technologies should be analysed as part of any assessment of the investment attractiveness of a country. They analysed 58 indicators of EU countries for the period of 2000-2018, evaluating the following dimensions: intelligence, networking and infrastructure; sustainability; digitalisation; learning; agility; innovation and being knowledge-driven. Studies by Tiutiunyk et al., (2021), Novikov (2021), Skrynnyk (2021), Sau-Wai Law (2021), Kwilinski et al., (2019), (2020), and Akimov et al., (2021) confirmed that digitalisation and artificial intelligence were statistically significant factors for economic growth, macroeconomic stability, and accordingly, the investment climate of a country. Studies by Harust and Melnyk (2019), Tiutiunyk et al., (2019), Kwilinski et al., (2020), and Czyżewski et al., (2022) confirmed that the economic security and innovation development of a country affect its attractiveness to foreign stakeholders.

1.5 Investment attractiveness and energy resources

Zhang and Liang (2021) underlined that energy resources were a driver of economic growth. Well-developed energy infrastructure, an affordable climate for green energy development, and appropriate government

support for energy initiatives allowed countries to increase their attractiveness to foreign investors. Fu et al., (2021) concluded that economic growth and investment attractiveness are interlinked with the energy security of a country. In this case, the researchers applied Fuzzy-TOPSIS, Principal Components Analysis and the Energy Trilemma Index methodology (calculated by the World Energy Council) to confirm the direct impact of energy prices, the accessibility of alternative energy, and energy infrastructure on energy security. Thus, countries with a high level of energy security had higher levels of investment attractiveness. Furthermore, based on the case of India, Nepal et al., (2021) proved the link between energy use, carbon emissions, economic growth, trade openness and foreign direct investment, leading them to conclude that governments should provide affordable conditions for renewable energy development, which would allow developing economies to attract more investors. Yemshanov et al., (2005) developed the Monte Carlo-based simulation model to estimate the investment attractiveness of the Canadian afforestation regions, confirming that their investment attractiveness could be increased if the price for CO_2 emissions per metric ton was higher than $10. Pan et al., (2019) analysed 12 indicators to estimate the investment attractiveness of countries, and estimated the economic and ecological dimensions of investment attractiveness for five oil and gas markets (Middle East, Central Asia, North Africa, America, and Southeast Asia). Three sub-indexes grouped all indicators: the attractiveness of oil and gas investment cooperation; the attractiveness of exploration and business development; and the attractiveness of oil and gas resources (Pan et al., 2019). At the same time, Chygryn and Krasniak (2015) justified the hypothesis that the investment climate of a country may have an effect on attracting green investment into the country for developing renewable energy sources.

1.6 Investment attractiveness and agri-resources

Studies by Jiang and Chen (2020), Wardhani and Haryanto (2020), Santangelo (2018), and Akinwale et al., (2018) proved that available agriculture resources were key to a country's attractiveness to foreign investors. In addition, foreign investments allowed countries to improve the efficiency of use of agricultural resources, as well as having a direct impact on food security. From another point of view, foreign investors paid attention to a country's level of food security. Jiang and Chen (2020) confirmed that developing countries required foreign investment to ensure food security; however, their investment climate was not attractive to investors. Based on the example of agriculture, Jiang and Chen (2020) discovered that the expectations of foreign investors and investment results did not match. Rashid and Razak (2017) and Rashid et al., (2018) confirmed the relationship between agriculture growth and investment attractiveness. Their studies proved the bidirectional causal relationships between foreign direct investment in agriculture and agriculture growth (agriculture market size, agriculture trade openness, poverty, the unemployment rate, and agriculture human capital). Jiang and Chen (2020) applied principal component analysis to the indicators of 135 countries. They analysed the following indicators: food supply-crops, primary equivalent, agriculture value added per worker, arable land and a block of economic indicators (GDP per capita, market size, labour market efficiency, inflation, GDP deflator, the Worldwide Governance Indicators, investor protection, and transport infrastructure). Wardhani and Haryanto (2020) confirmed that foreign direct investment in the agricultural sector had a positive statistically significant impact on the food security of developing countries for the period of 2012-2017. However, Santangelo (2018) confirmed that foreign direct investment in land had a positive im-

pact on food security in developed countries and a negative impact in developing countries. Akinwale et al., (2018) concluded that foreign investment had a positive impact on agriculture productivity. At the same time, they underlined the fact that attracting foreign investors is impossible without affordable agricultural resources and economic conditions. Based on the abovementioned analysis, the following indicators which affect investors' decisions could be identified: available arable land and forest area, added value of agriculture, forestry, and fisheries outputs, and so on.

1.7 Coupling between dimensions of investment attractiveness

It should be noted that most papers focused on the analysis of the core indicators which influenced investment attractiveness. Furthermore, the investment policy of a country should be developed considering the relationship and interconnection between core dimensions of the investment attractiveness of that country.

Following Li and Zhou (2012) and Shi et al., (2019), coupling is a measure of the strength of the relationships between modules; it is the extent to which different subroutines or modules are interdependent. The phenomenon of coupling means that two or more indicators affect each other through different interactions. The degree of coupling reflects the degree of correlation between systems. In some cases, this indicates a process of synergy between the systems. Ding et al., (2015) defined coupling based on class theory. Thus, coupling was the level of interaction between the methods, or all parts of the method corresponding to the main goal. A similar approach to the definition of coupling was used by Huang et al., (2020), who applied the coupling model to estimate the interactions between economic development and environmental quality as the basis for the assessment of sustainable development. Dong et al., (2019) applied the traditional coupling coordination degree model to estimate green growth in Mongolia. Gan et al., (2020) used the principles of coupling theory to measure the city-industry integration and highlighted the core options by which to increase it, analysing 18 cities from Sichuan province, China, for the period of 2000-2016. The abovementioned researchers combined coupling theory with the following methods: GRA, TOPSIS, HFPR, the Entropy Method, and PSOBPANN (Particle Swarm Optimisation Back Propagation Artificial Neural Network). Cheng et al., (2019) applied the coupling coordination model to identify the core way to increase the green competitiveness of 30 provinces in China. Li and Zhou (2012) and Shi et al., (2019) identified the following types of coupling: logical, procedural, functional, communicative, random, and consistent. Considering the studies of Li and Zhou (2012), Shi et al., (2019) and Ding et al. (2015), the following levels of coupling could be identified: a lack of coupling; slight coupling, some interdependencies, and a high level of coupling. The Law of Demeter (LoD) is used in programming to characterise the phenomenon of a low degree of coupling. Thus, object A should not directly access object C if object A has access to object B and object B has access to object C (Lienberherr, 1989). In economic theory, the higher the degree of coupling, the more efficient the system and the higher the degree of coordination between its components.

Considering the results of the analyses mentioned above, it is necessary to estimate the integrated level of the investment attractiveness of countries and the degree of coupling between the indicators of investment attractiveness of those countries.

2. Methodology

The following steps were taken in the assessment of the degree of coupling between the indicators of the investment attractiveness of countries:

1. Assessment of the investment attractiveness of a country.
2. Assessment of the level of coordination (T_i).
3. Assessment of the relationship between indicators of the investment attractiveness of a country.
4. Pairwise assessment of the degree of coupling between indicators of the investment attractiveness of a country.
5. Integrated assessment of the degree of coupling between all indicators of the investment attractiveness of a country.

At the first stage, the assessment of the investment attractiveness of a country was undertaken by means of the methodology shown in Figures 1-2.

Stage 1: Development of a database for assessing the investment attractiveness of a country

The following countries were chosen for the analysis: Bulgaria, Croatia, Lithuania, Latvia, Poland, Romania, and Ukraine, for the period of 2000-2020. The reasons for the choice of those countries were twofold: 1) common historical and political roots during the Soviet era for certain EU member countries (Bulgaria, Lithuania, Latvia, Poland, Romania); 2) the newest member of the EU, Croatia, joined the EU in 2013. All indicators were divided into internal and external ones. Furthermore, the internal indicators included five dimensions (Figure 1). The variables for analysis were chosen based on the compilation and benchmark analysis of the methodology by the global rating agency Solability, the World Economic Forum, The European House – Ambrosetti, the World Intellectual Property Organisation, and the World Bank.

Stage 2: Normalisation of indicators for assessing the investment attractiveness of a country

All indicators were normalised considering their impact on the investment attractiveness of a country: stimulators and destimulators (Figure 2).

Stage 3: Determination of the weight of indicators of the investment attractiveness of a country

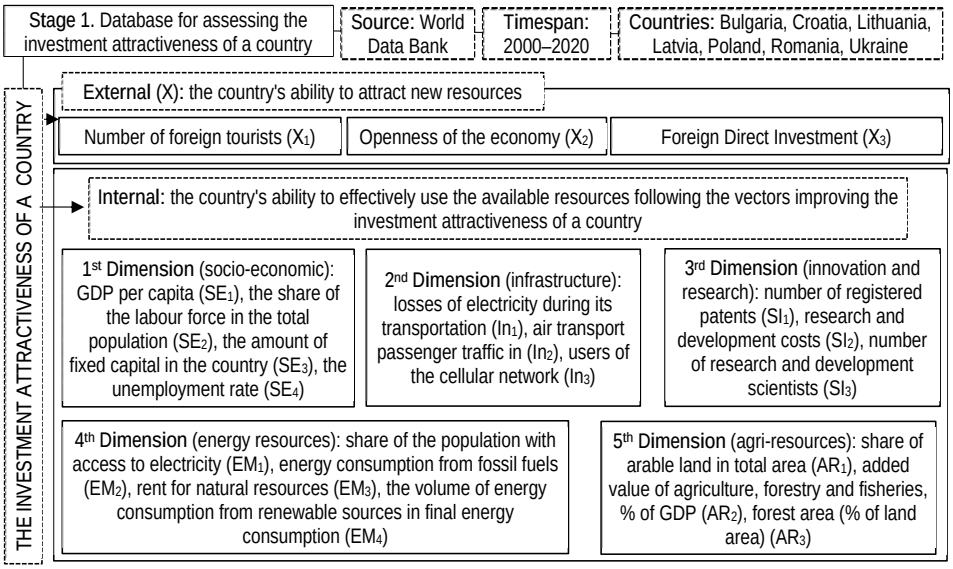
After normalising, the weight of the indicators was calculated using the entropy method, which allowed for the consideration of the variations of indicators, their probabilistic nature, and the asymmetry of exogenous information (Figure 2).

Stage 4: Integral assessment of the investment attractiveness of a country

The study applied the taxometric method to estimate the investment attractiveness of a country (Figure 2).

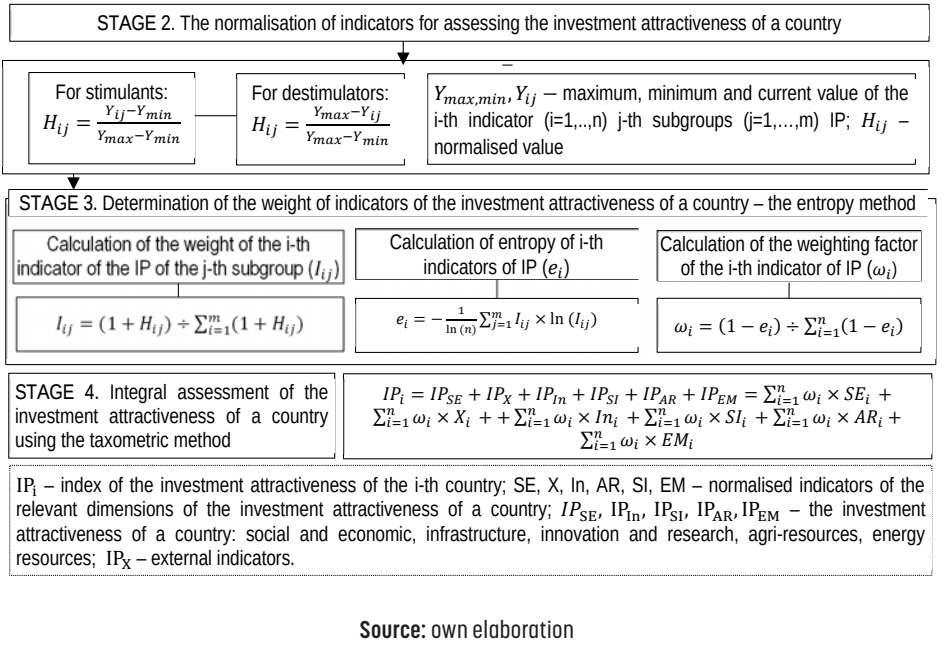
The scale for the investment attractiveness of a country was from 0 to 1. All calculations and relevant visualisations were made using the statistical application Stata 14.2.

Figure 1. The core indicators for assessing the investment attractiveness of a country



Source: own elaboration

Figure 2. The methodology for assessing the investment attractiveness of a country



Source: own elaboration

Considering the studies of Li and Zhou (2012), Shi et al., (2019) and Ding et al., (2015), the pairwise assessment of the degree of coupling between the socio-economic, infrastructural, innovation and research, agri- and energy resources dimensions was estimated in two stages. In the first stage, the degree of coupling between the components of the investment attractiveness of a country is assessed by determining the level of coordination (Equations 1-3):

$$T_i = \left(\sum_{i=1}^{n} q_i \times f_i\right)^{1/n} \quad (1)$$

where – the quantitative value of the level of coordination of i-indicator of the investment attractiveness of a country; – weighting factor; – indicators of the investment attractiveness of a country; – numbers of indicators of the investment attractiveness of a country.

The next stage was to determine the level of interrelationship and coupling between the indicators of the investment attractiveness of a country:

$$C_i = \left(\frac{\prod_{i=1}^{n} f_i}{\left[\frac{\sum_{i=1}^{n} f_i}{n}\right]^n}\right)^{1/n} \quad (2)$$

$$D_i = \sqrt{C_i \times T_i} \quad (3)$$

where – the quantitative value of the interrelationship; – the quantitative value of the degree of coupling.

The threshold of the degree of coupling between the components of the investment attractiveness of a country are grouped into four levels (Table 1).

Table 1. The threshold of the degree of coupling

Threshold	Coupling Degree
0.75 < Di ≤ 1	High
0.5 < Di ≤ 0.75	Above average
0.25 < Di ≤ 0.5	Below average
0 < Di ≤ 0.25	Low

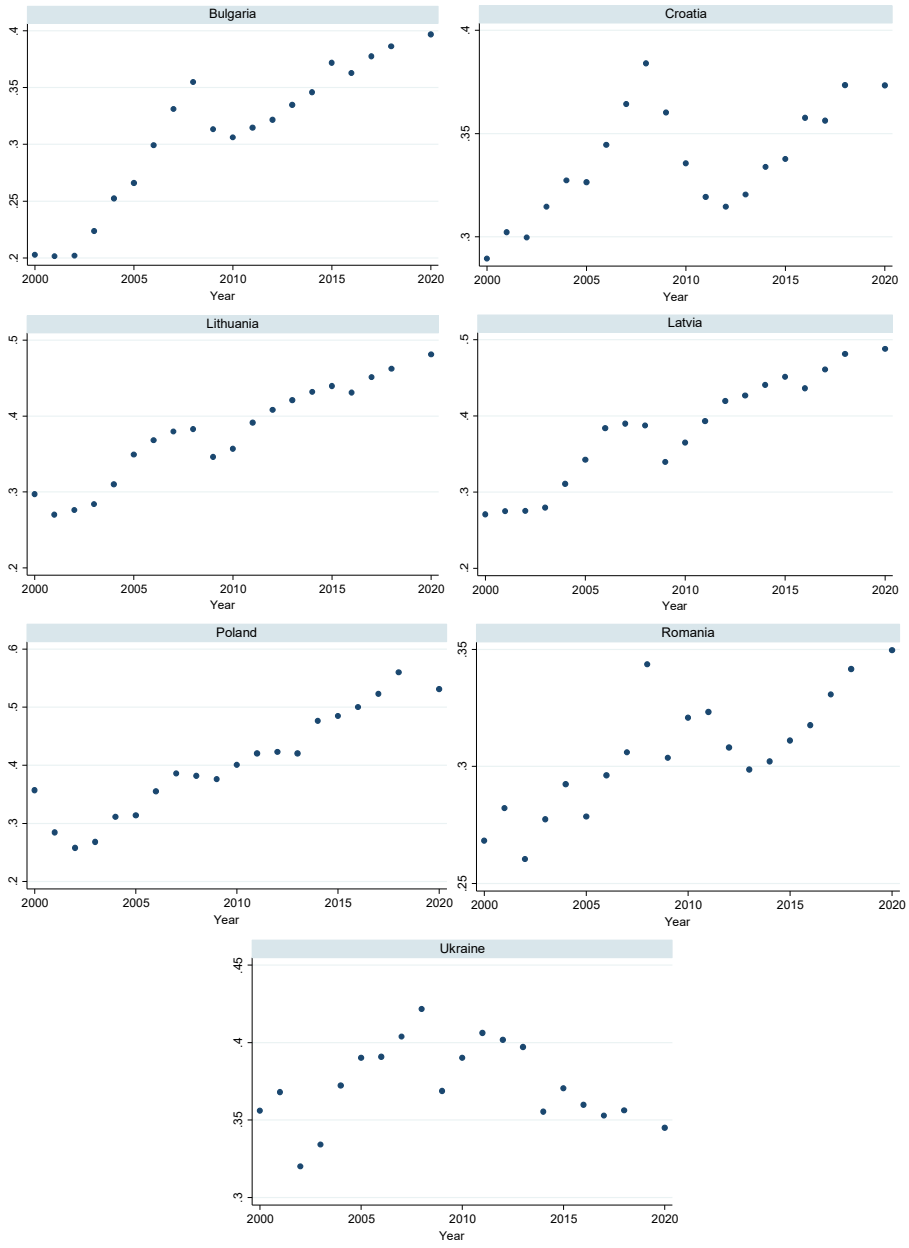
Source: own elaboration

The grouping of degrees of coupling (Table 2) is based on the etalon value – 1 (to which the indicator should be directed), with all values below 0.25 defined as a low degree of coupling, which reflects the high level of imbalance in the investment attractiveness of a country.

3. Research results

In the first stage, the investment attractiveness of the countries which were the subjects of research was assessed using the methodology presented in Figures 1-2. The findings for Bulgaria, Croatia, Lithuania, Latvia, Poland, Romania, and Ukraine are presented in Figure 3.

Figure 3. Results of an analysis of the investment attractiveness of countries



Source: own elaboration

The findings allowed for the identification of three clusters of countries depending on the convergence of trends in the integrated index of investment attractiveness:

1. Ukraine and Romania. Until 2014, the upward and downward cycles were similar; the highest level of investment attractiveness for Ukraine was

0.42 (2018); the period from 2014 to 2020 in Ukraine is characterised by a permanent decline in the level of investment attractiveness to the minimum level of 0.35 in 2020;

2. Croatia and Bulgaria. Increased level of investment attractiveness with a bifurcation point in 2008 due to the global financial crisis;
3. Lithuania, Latvia and Poland. Increased level of investment attractiveness, with the highest level in Poland (0.56) in 2018.

The next stage was an assessment of the degree of coupling between the dimensions of the investment attractiveness of a country for 2000-2020. The results confirmed the fluctuation of the degree of coupling between the dimensions of investment attractiveness at different times (Table 2).

Table 2. Dynamics of pairwise assessment of the degree of coupling between the dimensions of the investment attractiveness of a country (fragments for 2000 and 2020)

Variables	Bulgaria		Croatia		Lithuania		Latvia		Poland		Romania		Ukraine	
	2000	2020	2000	2020	2000	2020	2000	2020	2000	2020	2000	2020	2000	2020
X ↔ SE	0.34	0.47	0.43	0.51	0.38	0.48	0.37	0.46	0.46	0.55	0.32	0.47	0.45	0.45
X ↔ In	0.36	0.46	0.40	0.49	0.36	0.45	0.31	0.46	0.53	0.60	0.31	0.47	0.38	0.47
X ↔ SI	0.37	0.47	0.47	0.50	0.39	0.49	0.36	0.46	0.49	0.58	0.29	0.43	0.48	0.42
X ↔ AR	0.40	0.47	0.44	0.45	0.40	0.49	0.38	0.47	0.53	0.46	0.32	0.45	0.49	0.47
X ↔ EM	0.39	0.47	0.48	0.52	0.39	0.48	0.38	0.46	0.52	0.54	0.32	0.47	0.46	0.44
SE ↔ In	0.35	0.51	0.39	0.49	0.41	0.49	0.33	0.53	0.45	0.55	0.47	0.52	0.38	0.51
SE ↔ SI	0.36	0.52	0.45	0.49	0.47	0.55	0.43	0.52	0.43	0.54	0.36	0.45	0.50	0.44
SE ↔ AR	0.38	0.51	0.43	0.45	0.49	0.54	0.48	0.56	0.45	0.45	0.51	0.49	0.51	0.51
SE ↔ EM	0.38	0.54	0.64	0.55	0.57	0.61	0.73	0.61	0.57	0.53	0.80	0.54	0.62	0.39
In ↔ SI	0.38	0.50	0.42	0.48	0.42	0.50	0.32	0.52	0.48	0.58	0.36	0.46	0.39	0.46
In ↔ AR	0.43	0.50	0.40	0.44	0.44	0.50	0.34	0.55	0.52	0.46	0.48	0.50	0.39	0.56
In ↔ EM	0.41	0.50	0.42	0.50	0.41	0.49	0.34	0.53	0.51	0.54	0.48	0.52	0.38	0.49
SI ↔ AR	0.43	0.51	0.47	0.44	0.52	0.56	0.45	0.54	0.48	0.46	0.37	0.44	0.57	0.46
SI ↔ EM	0.42	0.51	0.52	0.50	0.47	0.55	0.45	0.52	0.48	0.53	0.37	0.45	0.51	0.43
AR ↔ EM	0.49	0.50	0.47	0.45	0.50	0.54	0.54	0.55	0.51	0.45	0.53	0.49	0.51	0.49

Note: X, SE, In, SI, AR, EM – relevant external dimensions, social and economic, infrastructure, innovation and research, agri-resources, and energy resources dimensions of the investment attractiveness of a country

Source: own elaboration

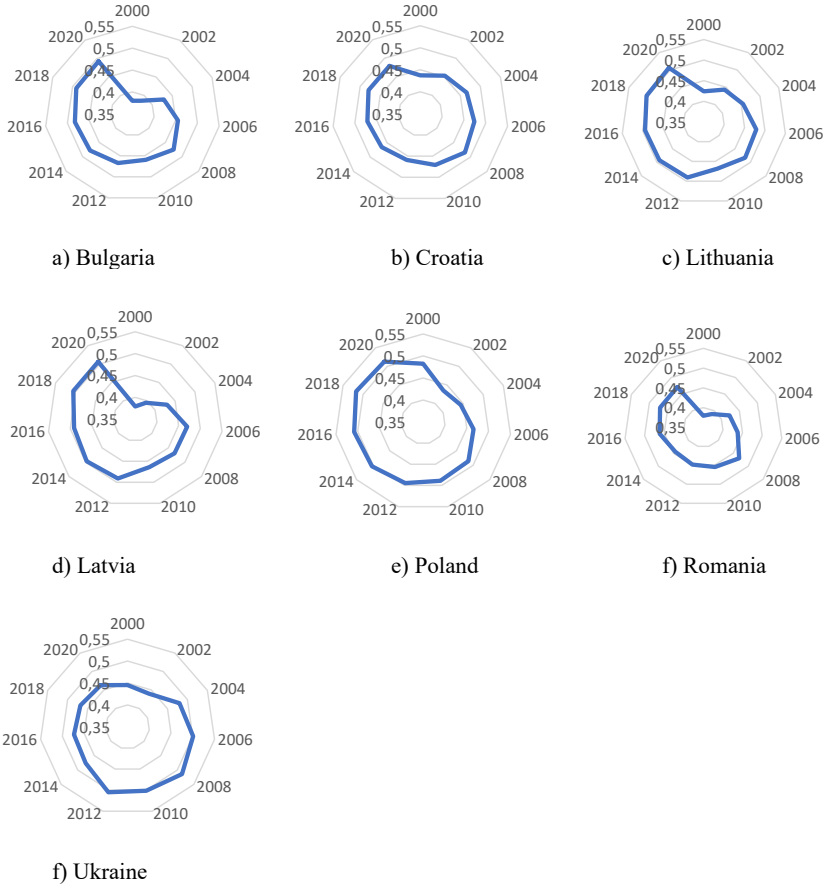
Considering the findings for Bulgaria, the highest degree of coupling was between the infrastructure and energy resources dimensions in 2020, and between agri-resources and energy resources in 2000. In Croatia (2000 – 0.64; 2020 – 0.55), Lithuania (2000 – 0.57; 2020 – 0.61), Latvia (2000 – 0.73; 2020 – 0.61) and Romania (2000 – 0.8; 2020 – 0.54) the highest degree of coupling was between the socio-economic and energy resources dimensions in both 2000 and 2020. Poland had the highest degree of coupling between the socio-economic and energy resources dimensions in 2000. However, in 2020,

the highest degree of coupling was between the external and infrastructure dimensions.

High rates of foreign direct investment for 2001–2008 and favourable conditions on global markets accelerated Ukrainian social and economic development. This was reflected in the achievement of the maximum degree of coupling between the external and socio-economic dimensions of the investment attractiveness of that country at a level of 0.51 in 2008.

The findings confirmed that in 2008 Ukraine had the highest degree of coupling between all dimensions of the investment attractiveness of a country (Figure 4f). Furthermore, the average level of the pairwise interconnections between dimensions of investment attractiveness was 0.52. In 2001, the socio-economic and energy resources dimensions had the highest degree of coupling, at 0.62.

Figure 4. Results of the analysis of the degree of coupling of the investment attractiveness of a country for the countries analysed in 2000-2020



a) Bulgaria b) Croatia c) Lithuania

d) Latvia e) Poland f) Romania

f) Ukraine

Source: own elaboration

The findings allowed the researchers to draw the conclusion that in Bulgaria, Croatia, Lithuania, Latvia, and Romania, the highest degree of coupling of the integrated investment attractiveness of a country was in the period of 2018-2020. However, in Poland it was in 2018, and in Ukraine in 2008.

It was noted that all the analysed countries, with the exception of Ukraine, saw an increase in the degree of coupling of the integrated investment attractiveness of a country with values of 0.47-0.52. This means that Bulgaria, Croatia, Lithuania, Latvia, Romania, and Poland had a convergent development policy which allowed them to improve their investment attractiveness. In Ukraine, by contrast, the degree of coupling began to decline after 2008, from 0.51 (2008) to 0.46 (2020). This was the result of unbalanced political, economic, social, and ecological development policy in Ukraine. Furthermore, the political and military conflicts provoked the outflow of foreign capital from the country.

4. Discussion

The findings confirmed that the national economy of Ukraine has the lowest level of investment attractiveness among the countries analysed. Jantoń-Drozdowska and Majewska (2016) obtained similar findings when comparing the investment attractiveness of the Baltic countries (Estonia, Latvia, and Lithuania), the Visegrad group (the Czech Republic, Hungary, Poland and the Slovak Republic), Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Moldova, Romania, the Russian Federation, Slovenia and Ukraine. Furthermore, in 2013 Ukraine occupied 82nd place in the Foreign Direct Investment Attraction Index (out of 195 countries), a fall of 31 places compared with 2010 (51st place). Considering the findings, it is possible to state that the investment attractiveness of Ukraine had declined by 2020 when compared to 2010. However, in Bulgaria, Croatia, Lithuania, Latvia, Poland and Romania, the investment attractiveness increased. This leads to the conclusion that Ukraine fulfilled the prerequisites for compelling the disclosure of investment attractiveness by identifying inhibitors and catalysts for the managerial impact of improving the investment climate.

The results of the pairwise assessment of the degree of coupling between the dimensions of investment attractiveness revealed that, in 2020, Bulgaria and Lithuania had the lowest level of coupling between external and infrastructure dimensions, which in turn meant that Bulgaria and Lithuania should implement a coherent mechanism for improving the investment climate. Given that developing preferential rates for foreign investors can attract foreign direct investment, the development of affordable tourist infrastructure could attract new tourists. Furthermore, the Bulgarian government should develop the IT infrastructure in the country and increase the digital inclusion of society. Considering the findings, Croatia had the lowest degree of coupling between the agri-resources, infrastructure and socio-economic dimensions (0.44). In this case, Croatia should provide convergent agricultural, social and economic policies. However, in Latvia, the external dimension had the lowest degree of coupling with all other dimensions of the investment attractiveness of that country. This allowed for the conclusion that the Latvian government should pay attention to the development of tourism infrastructure and increase economic openness. The Polish and Romanian governments should provide a supportive mechanism for agricultural development, which should be convergent with the socio-economic and energy development of the country. The Ukrainian government should harmonise the socio-economic and energy development of the country, as the lowest degree of coupling was observed between the social and economic and energy resources dimensions.

In 2020 Lithuania, Latvia and Poland had the highest degree of coupling between all dimensions of the integrated investment attractiveness index (0.51), and Ukraine the lowest (0.46). The results showed that in 2008 Ukraine had the highest degree of coupling among all dimensions of the investment attractiveness of a country. The findings proved

the inefficiency of the current automatic stabilisers when it comes to coordinating and interconnecting the investment attractiveness of Ukraine. As a result, it limits the development of a favourable investment climate in the country, which could increase the efficiency of investment processes in the national economy.

The findings confirmed that the countries analysed should develop and implement mechanisms by which to achieve the convergent development of the relevant dimensions of investment attractiveness. At the same time, they should focus on the leading EU countries and analyse the reasons behind their stable economic growth, which makes investment more attractive. For the purposes of further investigation, an analysis of the investment attractiveness of all EU members is recommended, in order to identify the directions which limit the inflow of investment.

Conclusions

In conclusion, the current research estimates the investment attractiveness of countries and identifies dynamic trends in changes in the degree of coupling between the dimensions thereof. The features of the investment attractiveness of a country are the dynamic and interconnected development of its determinants. Thus, the paper developed approaches to the assessment of the degree of coupling between dimensions of the investment attractiveness of a country. The approach developed considers the level of coordination and interconnectedness between dimensions. Coupling means that two or more indicators affect each other through different interactions. The degree of coupling reflects the correlations between systems. In some cases, it confirms the synergy between systems. The coupling scale was grouped based on the etalon value of coupling – 1 (towards which the indicator should move). A value of below 0.25 is defined as a low level of coupling, which reflects the high level of imbalance between dimensions of the investment attractiveness of a country. The findings pertaining to coupling (due to the identification of imbalances in the development of its sectors, aligning public investment policy with updated economic growth strategies and policy documents) could be the basis for government decisions to improve the investment attractiveness of a country, as well as foreign stakeholder confidence, and in so doing reduce the outflow of investment.

Despite the actual findings pertaining to the degree of coupling between the core dimensions of investment attractiveness, this study had several limitations. Thus, in further investigation, it would be necessary to consider cointegration in the chain «the investment attractiveness of a country ↔ institutional determinants ↔ behavioural determinants». This could be the basis of government decisions on the development of a positive business climate, the attractiveness of foreign investment, increasing labour productivity through the transfer of innovative technologies, the efficient use of agro-climatic resources, reducing the energy intensity of the country, and the transition to alternative energy sources. It indicates the possible direction of further investigations.

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