
Research article

Incentivised investment projects in the Czech Republic in the perspective of the integrated CV-TOPSIS framework since 2000: Has anything changed?

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Abstract: Evaluating the efficiency of incentivized investment projects requires a multidimensional framework that jointly considers investor outcomes, public support, and regional productivity. Our aim of this study was to evaluate the effectiveness of individual investment projects that have received investment incentives in the Czech Republic since 2000 using the CV-TOPSIS technique. In the context of the four criteria monitored (investment size, maximum level of public support, value added per employee, and effectiveness of the granted investment incentives), the research set consisted of all investment incentives with available data: 1,222 investment incentives. These investments were evaluated from the perspective of the level of involvement of companies (investments) in global value chains (GVC), sector, region and ownership. We developed an efficiency index combining investor's activity, public finance, and regional productivity dimensions. Our results confirmed that the effectiveness of investment incentives granted to business projects is conditioned by a complex combination of factors. The highest-ranked projects are concentrated in biotechnology and medical technology, electronics and electrical engineering, and transport equipment manufacturing. Investments in the Ústí nad Labem Region also achieved strong overall scores. In addition, projects implemented by firms occupying leading positions in production networks tended to perform better across evaluated dimensions. The findings suggest that the effectiveness of investment incentives depends on a complex interaction between industrial structure, regional conditions, and GVC integration. The study contributes

to quantitative economic policy evaluation by providing a large-scale multicriteria assessment of incentivized investment projects supported projects in a post-transition economy.

Keywords: investment incentives; business environment; global value chains (GVCs); TOPSIS method; multi-criteria decision-making (MCDM); investment efficiency; economic policy

JEL Codes: F21, H25, C58, F23, R11

Abbreviations: Central and Eastern Europe: CEE; Foreign direct investment: FDI; Value chains: GVCs; Multi-criteria decision-making: MCDM

1. Introduction

The countries of Central and Eastern Europe (CEE) have undergone a dramatic economic transformation since the 1990s, with foreign direct investment (FDI) playing a key role in the process of privatisation, modernisation, and integration into the global economy. After joining the European Union, the CEE region became a significant recipient of FDI, especially in manufacturing, services, and high-tech sectors. FDI is generally considered a key factor in the economic growth of host countries: It brings in new capital, creates jobs, and enables the transfer of modern technologies and know-how to the domestic economy (Naughton et al., 2016; Alfaro, 2017; Tkalenko et al., 2022; Govori and Fejzullahu, 2020).

On the other hand, the inflow of FDI may negatively distort the local market and cause the displacement of domestic investment. The high share of foreign firms in the host economy poses the risk of a sudden outflow of investors. Another significant risk is the crowding-out effect, where domestic companies are unable to keep pace with technological leaders from abroad, who have greater capital resources (Mullen, 2010).

In global value chains (GVCs), FDI is embedded in production networks that influence knowledge and technology transfer. Firms already integrated into GVCs tend to absorb FDI benefits more effectively, suggesting that global connectivity amplifies positive effects (Antràs, 2020; Szymczak et al., 2023).

Driffield and Hughes (2003) were the first to point out that the impacts of FDI on the host business environment can vary within a country. Research from recent years has shown that the positive effects of foreign investment are often concentrated in economically stronger regions, while they are weaker elsewhere. It has been repeatedly documented for the Czech Republic and other new EU member states that the benefits of FDI are not uniform: Business environments with a higher level of development, better infrastructure, and a skilled workforce are able to benefit more from the presence of foreign investors than economically weaker areas (Stojčić and Orlić, 2020; Kotíková, 2023).

When assessing the effectiveness of FDI, it is therefore necessary to consider the geographical context (core vs. periphery). The challenge for economic policy is to ensure that the positive effects of FDI spread beyond the main development centres and do not contribute to increasing regional inequalities. In this case, investment incentives are an economic policy tool and, at the same time, an important FDI location factor (Damborský, 2023).

The costs of attracting foreign capital to the host business environment are more easily quantified and

identifiable than the benefits and impacts. The benefits are not immediately identifiable. Some appear only over a long period of time (Katitas and Pandya, 2024) (integration of domestic enterprises into subcontracting chains of multinational companies, growth in labour productivity), and other potential (spillover effects) may not appear (Benáček et al., 2014; Choi, 2018). The state spends considerable financial resources in an attempt to achieve benefits that may not arise in the business environment and, in reality, are very difficult to measure (Kotíková, 2019). Governments often grant investment incentives repeatedly to the same investor without sufficient evaluation of the benefits and impacts of the investment in the business environment.

Despite the extensive literature on the impacts of FDI, some areas remain insufficiently researched. One of them is the evaluation of the effectiveness of individual investment projects at the micro level, in the context of firms' involvement in global value chains.

Most empirical studies focus either on sectoral heterogeneity, regional effects, or firms' participation in GVCs, while evidence simultaneously integrating all three perspectives at the level of individual investment projects remains limited, particularly for post-transition economies such as the Czech Republic (Colen et al., 2016; Havránek and Hampl, 2018; Markauskas and Baliute, 2021; Szymczak et al., 2023). This gap in the literature is also evident in the context of broader debates on the sustainability of foreign investments in the post-transformation economies of CEE (Marková and Arltová, 2023). After 2000, a significant growth of FDI occurred in the Czech Republic. Act No. 72/2000, on Investment Incentives, played a role. It is therefore an ideal time to assess which investments have proven themselves, also from the perspective of economic policy and the institutional support they have received.

Based on the identified gap, the research question is formulated as follows: How are regional location, sectoral affiliation, and position within global value chains associated with the relative efficiency rankings of incentivized investment projects in the Czech Republic? In this study, we respond to this gap, linking the assessment of the effectiveness of investment incentives with the analysis of the involvement of companies in global value chains. Using the multi-criteria TOPSIS method, 1,222 investment projects implemented in the Czech Republic in 2000–2021 are evaluated. We combine four key attributes: the amount of investment per job, public support per job, the regional level of added value per employee, and the efficiency coefficient of the investment incentive. This approach enables the integration of investor and state perspectives while highlighting regional and structural differences in investment efficiency.

Evaluating investment projects across several economic, public-finance, and regional criteria constitutes a multidimensional problem for which multi-criteria decision-making methods are particularly suitable. MCDM frameworks integrate multiple criteria into a transparent comparative assessment and commonly combine a criterion-weighting stage with an alternative-ranking stage. Applications in investment and firm-performance evaluation demonstrate this integrated logic and use TOPSIS either as a ranking technique or as a comparative reliability check (Yüksel et al., 2025; Katrancı et al., 2025).

To explain why incentivized investment projects may achieve different relative efficiency rankings, we combine several complementary theoretical perspectives. Location theory emphasizes that the outcomes of foreign investment depend on location-specific advantages, including infrastructure, labour qualifications, supplier networks, and access to knowledge. Institutional theory explains how formal rules and investment incentives shape firms' opportunities and location decisions. The core–periphery perspective highlights the uneven spatial distribution of productive resources and absorptive capacity, while

global value chain governance theory explains how firms' positions within production networks affect coordination power, knowledge access, and opportunities for value capture. Finally, the resource-based view suggests that firms differ in their ability to exploit the same external conditions because they possess different technological, human, and organisational capabilities.

Our main contribution of this study is to provide a large-scale, data-driven evaluation of investment-incentivized projects using a consistent multi-criteria approach in the Czech Republic. Specifically, we contribute by analysing an extensive micro-level dataset covering 1,222 investment projects implemented in the Czech Republic between 2000 and 2021 and jointly examining sectoral, regional, and GVC-related heterogeneity within a single empirical framework. The study is structured as follows: In the introduction, the research gap is identified, and the objective of the research is defined. The content of the first chapter provides an overview of the current state of play in the field of investment incentives, including their effectiveness and efficiency. The second chapter provides an extensive description of the methodology, presenting the TOPSIS technique as a fundamental tool for comparing investment incentives, the monitored criteria, and the method for addressing their multicollinearity. In the third chapter, we present the evaluation of individual investment incentives at two levels: for the entire monitored period and for each individual monitored year separately. In the fourth chapter, we discuss the results from different perspectives. The last part is the conclusion, which reflects recommendations for economic policy.

2. Purpose and effectiveness of investment incentives

Investment incentives are policy instruments used by governments to stimulate economic growth, attract foreign direct investment, and encourage entrepreneurial activity, the transfer of technology, and the creation of jobs (Czechinvest, 2025); they are also used to achieve improvements in manufacturing (Danzman and Slaski, 2022) and to induce local research and development activities (Wellhausen, 2013). The goal of investment incentives is to influence where private firms locate economically productive activities. Governments often offer investment incentives of a fiscal nature in the form of tax incentives (tax breaks or tax holidays) to attract foreign direct investment to their host environment (Katitas and Pandya, 2024). This phenomenon leads to something known as Incentive Redistribution, which distorts the market and can lead to the emergence of a so-called dual economy (Narula, 2018). On the one hand, governments support the influx of large capital-strong companies, providing them with tax breaks or, as is the case in CEE countries, other forms of (financial) investment incentives (grants for each new job created, employee training, etc.), and on the other hand, small and medium-sized companies operate in the same business environment as taxpayers who, due to their limited capital equipment, cannot compete with FDI (recipients of incentives) technologically or with a range of benefits and higher wages to maintain experts and the qualified and experienced workforce (Kotíková, 2019).

However, the effectiveness of these incentives depends on their alignment with the needs and conditions of the host country (Wu and Burge, 2018; Damborský, 2023). Based on an extensive firm-level dataset, (Katitas and Pandya, 2024) showed that the so-called real incentives (infrastructure, direct subsidies, support for workforce training) have the greatest effect on attracting FDI, while tax breaks have only a limited effect. Furthermore, (Katitas and Pandya, 2024) noted that investment incentives lead to investments even in regions that were previously

unattractive to foreign investors. Hlaváček and Janáček (2019) confirmed that incentives have a direct effect on the localisation of investments.

It turns out that the type of investment, the sector of activity, the regional location, and the involvement of the host economy in GVCs can significantly influence the extent and nature of the effects of FDI on domestic businesses and the overall economy (Alfaro, 2003; Wang, 2010; Alfaro, 2017). However, their effectiveness differs significantly between individual regions; core areas can benefit more than peripheral regions, which can exacerbate disparities between business environments.

Wallerstein's world-systems perspective distinguishes core, semi-peripheral, and peripheral positions within an unequal international division of labour (Wallerstein, 1974). Applied to Czech regional policy, this perspective motivates examining whether investment incentives directly supported jobs towards economically lagging regions with higher unemployment (Damborský, 2023). This highlights the complexities and challenges of designing effective investment incentive programmes. (Eichfelder et al., 2023) noted that although incentives can increase the number of investments, they often lead to a reduction in their quality; that is, the ability to generate future income. An evaluation of the effectiveness of investment incentives should therefore take into account not only the volume, but also the quality of supported projects. (Katitas and Pandya, 2024) confirmed that the existence of unused industrial capacity or ready infrastructure can fundamentally strengthen the effectiveness of incentives. Investment incentives also have positive indirect effects; they create new business opportunities and support the formation of subcontractor ties, while most new jobs are created at suppliers, rather than directly at companies receiving the incentives (Hlaváček and Janáček, 2019).

However, measuring the actual benefits of investment incentives remains difficult. Some expected benefits, such as the involvement of domestic companies in the supply chains of multinational companies or productivity growth, may become apparent only over a longer time horizon, while other potential effects (e.g., transfers of technology and know-how) may not occur at all (Benáček et al., 2014; Choi, 2018). The costs of attracting foreign capital are incurred immediately, but the corresponding benefits are often uncertain and difficult to measure (Kotíková, 2023).

Governments often spend considerable financial resources to support investments in the hope of future positive effects, which may not arise in the business environment at all, and in practice, it is very difficult to quantify these effects clearly. Under these circumstances, it is not unusual for investment incentives to be repeatedly granted to the same investors without a thorough evaluation of the benefits and impacts of their previous projects, which raises doubts about the effective use of public resources.

Investment incentives are examined mainly in the context of the fulfilment of their goals, i.e., in the context of regional development, the inflow of foreign capital, economic growth, and support for employment growth (Damborský, 2023). Some studies at the micro level demonstrate positive effects, such as (Cedidlova, 2013). Empirical findings by Katitas and Pandya (2024) showed that real incentives can have a measurable impact on the geographical distribution of FDI and bring investments to less developed areas.

Within the Czech Republic, the intended goal of directing investments to areas with high unemployment has not been consistently achieved, which indicates a mismatch between policy goals and results (Damborský, 2023). Slaski et al. (2025) added that financial incentives alone cannot reverse strong agglomeration tendencies: Investors prefer developed centres with quality infrastructure and facilities, so incentives directed to structurally weak areas often miss the mark.

These findings highlight the importance of contextual factors, such as the maturity of the business environment, the availability of a skilled workforce, and the absorptive capacity of regions. These factors can determine whether an investment incentive generates the desired positive spillover effects or remains an isolated subsidy without a broader impact (Barasa et al., 2017).

In deeply integrated value chains, FDI can function as part of a wider production network, influencing how and to whom knowledge and technology are transferred (Antràs, 2020). Some studies suggest that if domestic firms are already involved in international chains (e.g., as subcontractors for exports), they more easily absorb the benefits of foreign investors and catch up more quickly with their productivity (Szymczak et al., 2023).

The literature offers mostly aggregated views on the relationship between investment and economic growth (Görg and Greenaway, 2004; Newman et al., 2015; Havránek and Hampl, 2018; Sass et al., 2018), with only a limited number of researchers focusing on the micro-level of individual investment projects (Driffield and Hughes, 2003; Colen, et al. 2016; Rathnayake et al., 2023) and the link between the effectiveness of investment incentives and firms' participation in GVCs.

Domestic and foreign economic entities can apply for an investment incentive in the Czech Republic. From 1998 to 31 August 2025, a total of 1,341 business projects received this form of institutional support in the Czech Republic. Each applicant must meet the required criteria related to the minimum number of newly created jobs and the size of the investment. In the case of strategic service centres, an additional eligibility condition is that the services must be provided in at least three countries (Czechinvest, 2025). The amount of government support depends on the size of the investment and the size of the company. The most frequent investment incentive is corporate income tax relief for a period of ten years. This form of support is intended for all businesses, regardless of their size.

Furthermore, investors can receive material support for newly created jobs amounting to EUR 8,000 (CZK 200,000) per new job. Over 42% (567) of investment incentive applicants were FDI. The cash grant for employee training in the form of an investment incentive is intended only for technology centres nowadays. Conversely, material support for the acquisition of property in the amount of up to 20% of the eligible costs is linked to strategic investments in high-tech repair centres.

3. Materials and methods

In the context of the above, the research hypotheses can be formulated as follows:

RH1: We assume that investment projects undertaken by lead firms and first-tier suppliers (GVC = 1, 2) achieve different efficiency (rankings) than projects undertaken by second- and third-tier suppliers (GVC = 3, 4).

Global value chain governance theory explains how coordination, power, knowledge requirements, and supplier capabilities shape firms' positions within production networks. Lead firms influence network standards, supplier selection, and the organisation of production, while first-tier suppliers generally perform more complex and knowledge-intensive activities than lower-tier suppliers. These positions may provide greater access to knowledge, stronger coordination capabilities, and broader opportunities for value capture. In contrast, lower-tier suppliers are more likely to perform standardized activities with limited strategic autonomy. Position within the production network should therefore be systematically associated with the relative efficiency of incentivized projects.

RH2: We assume that project evaluation is different across sectors.

The resource-based view explains performance differences through the heterogeneous distribution and use of firm-specific technological, human, physical, and organisational resources. Firms that possess and effectively deploy valuable and difficult-to-replicate capabilities should be better positioned to generate value from an investment project and to exploit external support. In the context of this study, technology- and knowledge-intensive sectors may require more specialized resources and capabilities than activities based predominantly on standardized production. Sectoral affiliation may therefore capture part of the underlying heterogeneity in firms' productive capabilities.

RH3: We assume that project evaluation is different across Czech regions.

The core-periphery perspective suggests that economically stronger locations concentrate infrastructure, skilled labour, knowledge institutions, supplier networks, and decision-making functions, whereas peripheral locations tend to possess fewer complementary resources. Applied at the subnational level, this logic implies that the benefits associated with foreign investment may depend on a region's capacity to absorb and diffuse technology, knowledge, and demand linkages. Investment incentives may attract projects to structurally weaker regions, but the presence of an investment alone does not ensure that the project will become strongly embedded in the regional economy or generate comparable value-added effects. Regional heterogeneity should therefore be reflected in the relative efficiency rankings of incentivized projects.

RH4: We assume that project evaluation is different depending on ownership.

The differences in behaviour between domestic investments and foreign investment stem from varying motivations, risk profiles, and resource access based on ownership. Domestic investors benefit from deep knowledge of the local market, regulations, and culture, but their goals are often tied strictly to the local economic cycle. Conversely, foreign investors face the initial disadvantage of an unfamiliar environment (liability of foreignness), which they offset by bringing advanced technologies, global managerial know-how, and access to international capital. Foreign investment is driven by the global strategy of a parent company, such as seeking efficiency or new markets, and exhibits higher mobility, enabling foreign owners to relocate capital and production to another country more flexibly than domestic owners during times of political or economic instability.

Our aim of this study is to evaluate the effectiveness of individual investment projects that have received investment incentives in the Czech Republic since 2000, using the CV-TOPSIS technique. The basic set consists of all investment incentives (1,300) recorded in the database of CzechInvest (Czechinvest, 2025), the Agency for Investment and Business Development of the Czech Republic, which was founded in 1992 by the Ministry of Industry and Trade. In the context of the four monitored criteria, the research sample consists of all investment incentives with available data, of which there are 1,222. Their detailed structure from the perspective of individual factors is contained in Annex 2. All data used is freely accessible, usable, modifiable, and shareable by anyone for any purpose (see CzechInvest (2025) Cases with incomplete information for any of the four criteria that are excluded using listwise deletion). The sample covers investment projects across sectors and regions. The CzechInvest database also records investment incentives after 2021; however, complete information for all four monitored criteria is not available for these projects. The research sample therefore represents the most up-to-date set of investment incentives in the Czech Republic for which complete data on all four criteria are available.

The set of investment incentives is then evaluated in the context of the specified research objective using the following logic (Figure 1):

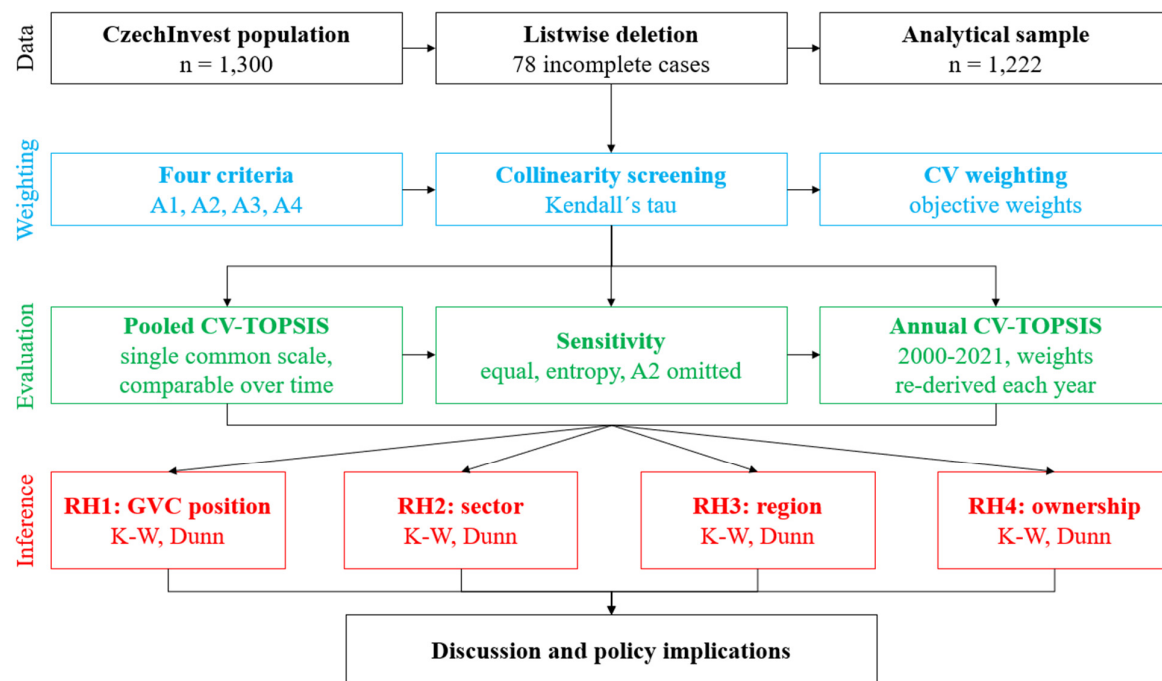


Figure 1. Research design, sample construction, and the mapping from each hypothesis to its test.

3.1. TOPSIS technique and characteristics of the criteria used

One of the basic methods of multi-criteria decision-making is the Technique for Order of Preference by Similarity to Ideal Solution (hereinafter “TOPSIS”), which is primarily used to solve various types of decision-making problems. Unlike single-indicator approaches, the proposed CV-TOPSIS framework enables simultaneous evaluation of investment scale, subsidy intensity, regional productivity, and incentive effectiveness. The coefficient of variation provides data-driven weights and avoids subjective prioritization. In combination with the issue of foreign direct investment (FDI), its application is often proposed at both the national (Lin and Tsai, 2010; Luo and Li, 2018; Çalık et al., 2019) and international levels (Paul, et al. 2014; Gokmenoglu and Alaghemand, 2015; Tomelin, et al. 2018). More recent applications include manufacturing (Bait et al., 2021) and the textile industry (Şahin et al., 2025), as well as the internationalisation of companies from emerging markets (Correa da Cunha et al., 2022) and the identification of factors affecting their performance (Wanke et al., 2024).

The first step of the TOPSIS technique is the computation of the normalized criterion matrix (Jablonský, 2007; Khan et al., 2026). This matrix normalizes the criterion values of all the variants so that they can be equivalently compared. Denoting the original criterion matrix containing the criterion values of each variant by a matrix $\mathbf{R}$ in which the criteria are written in columns ($j = 1, 2, 3, \dots k$) and the variants in rows ($i = 1, 2, 3, \dots n$), the computation of the elements of this normalized criterion matrix $\mathbf{R}_N$ can be given by the following formula:

$$r_{ij} = \frac{y_{ij}}{\sqrt{\sum_{i=1}^p y_{ij}^2}} \quad (1)$$

where:

r_{ij} —component of the i -th row and j -th column of the normalized criterion matrix R_N

y_{ij} —component of the i -th row and j -th column of the original matrix R

p —total number of rows (of different variants) of the matrix R

When minimization criteria are present, their nature is converted to maximization using formula (before the vector normalization):

$$y_{ij} = -y_{ij} \quad (2)$$

where:

y_{ij} —component of the i -th row and j -th column of the original matrix R

To calculate the normalized weighted criterion matrix R_{NV} , we multiply the matrix R_N by the weight matrix V ; i.e., we multiply the criterion values of each variant by the weight of the criterion. The weight matrix V must contain the weights of all criteria and, at the same time, the weights must form a unit length vector, i.e., their total sum is equal to one. The formula is shown as follows:

$$w_{ij} = v_j r_{ij} \quad (3)$$

where:

w_{ij} —component of the i -th row and j -th column of the normalized weighted criterion matrix R_{NV}

v_j —component of the j -th column of the matrix (vector) of weights V

r_{ij} —component of the i -th row and j -th column of the normalized criterion matrix R_N

After obtaining the normalized weighted criterion matrix R_{NV} , we can proceed to calculate the distances from the Positive Ideal Solution (PIS). If the condition of the maximization criteria is met, the ideal variant can be identified as the maximum value for a given criterion (values in the columns of the R_{NV} matrix). Thus, a matrix (vector) of ideal variants H will be found according to the following formula.

$$H_j = \max_i(w_{ij}) \quad (4)$$

where:

H_j —component of the j -th column of the matrix (vector) of ideal variants

$\max_i()$ —function finding the i -th row (variant) with the maximum value (in a specific column)

w_{ij} — j -th column of the normalised weighted criterion matrix R_{NV}

Once the matrix of ideal variants H is found, it will be possible to calculate the distance of each variant from the ideal variants for all criteria. This distance is calculated according to the following formula:

$$d_i^+ = \sqrt{\sum_{j=1}^k (w_{ij} - H_j)^2} \quad (5)$$

where:

d_i^+ —total distance of the i-th variant from the ideal variants of all criteria

w_{ij} —component of the i-th row and j-th column of the normalized weighted criterion matrix R_{NV}

H_j —component of the j-th column of the matrix (vector) of ideal variants

The next step is to find the basal variants that represent the vector of the worst possible criterion values across all options. If the condition of maximization criteria is used, the basal variant can be identified as the minimum value for the criterion (the values in the columns of the R_{NV} matrix). Thus, a matrix (vector) of basal variants D will be found according to formula.

$$D_j = \min_i(w_{ij}) \quad (6)$$

where:

D_j —component of the j-th column of the matrix (vector) of basal variants

$\min_i()$ —function finding the i-th row (variant) with the minimum value (in a specific column)

w_{ij} —j-th column of the normalised weighted criterion matrix R_{NV}

After finding the matrix of basal variants D , it will be possible to calculate the distance of each variant from the basal variants for all criteria. This distance is calculated according to the following formula:

$$d_i^- = \sqrt{\sum_{j=1}^k (w_{ij} - D_j)^2} \quad (7)$$

where:

d_i^- —total distance of the i-th variant from the basal variants of all criteria

w_{ij} —component of the i-th row and j-th column of the normalized weighted criterion matrix R_{NV}

D_j —component of the j-th column of the matrix (vector) of basal variants

In the last step, the total distances of specific variants from the ideal (PIS) and basal variants (NIS) variants (d_i^+ and d_i^-) are used to calculate an indicator of the relative distance of the variants from the basal variant c_i according to the following formula:

$$c_i = \frac{d_i^-}{d_i^+ + d_i^-} \quad (8)$$

where:

c_i —indicator of the relative distance from the basal variant of the i-th variant

d_i^+ —total distance of the i-th variant from the ideal variants of all criteria (PIS)

d_i^- —total distance of the i-th variant from the basal variants of all criteria (NIS)

A description of the calculation, along with a significant review of the literature and application level, is also offered by the research of Vavrek (2026).

The resulting scores obtained based on this method cannot be compared between individual years, as they are not on a common scale.

3.2. Weight of criteria determination

Determining importance is one of the main steps in the application of not only the TOPSIS technique, but also all MCDM methods. Yalcin and Unlu (2018), with corroboration of Khan et al. (2024), found that the application of the MCDM method primarily depends on the method of determining the weights of the criteria. Kersulienė et al. (2010) used four groups of approaches to determine weights, while the presented works used a representative of objective methods, i.e., the “Coefficient of Variance” (hereinafter “CV”) method, based on the relative variability of the monitored criteria (see (Singla et al., 2018)).

$$w_j = \frac{CV_j}{\sum_{j=1}^n CV_j} = \frac{\frac{\sigma_j}{\bar{x}_j}}{\sum_{j=1}^n \frac{\sigma_j}{\bar{x}_j}} \quad (9)$$

where:

CV_j —coefficient of variation of the j -th criterion

n —number of criteria

$\bar{x}_j$ —average value of the j -th criterion

Based on a literature review, four criteria (investment attributes) have been selected for the purposes of this study. In our view, they capture the perspectives of the investor (A1) and that of the state in the form of support from its side (A2) while reflecting regional disparities (A3) and the effectiveness of the investment incentives provided (A4). In total, the evaluation covers 1,222 investments made in the Czech Republic since 2000 with a total volume of EUR 31.18 billion, which are evaluated using the following set of criteria/attributes:

A1: Investment size in EUR thousand per job created (benefit criterion); individual value for each observation/investment.

A2: Ceiling of public support in EUR thousand per job created (cost criterion); individual value for each observation/investment.

A3: Added value per employee at the level of individual regions of the Czech Republic (benefit criterion); regional value, i.e. projects in the same region have the same criterion value.

A4: Coefficient of effectiveness of investment incentives provided (benefit criterion); individual value for each observation.

The first three criteria (A1, A2, A3) are ratio indicators calculated based on data from (Czechinvest, 2025). The calculation of the fourth criterion, the coefficient of effectiveness of the investment incentives provided, therefore uses data that is a partial input to the other monitored attributes. A4's numerator contains regional value added per employee (A3), and its denominator contains investment per job (A1).

$$A4 = i = \frac{\sum_{i=1}^M (GVA_{per\ employee,i} * JOB_i)}{\sum_{i=1}^M INVEST_i} \quad (10)$$

where:

$GVA_{per\ employee,i}$ —added value per employee in i-th company

JOB_i —number of newly created jobs in i-th company

$INVEST_i$ —size of investment incentive per job created in i-th company

In view of this fact, we test multicollinearity using pair correlation coefficients (see (Chan et al., 2022)). We consider the value of Kendall's rank correlation coefficient (r_K) of 0.8 to be the threshold (see (Kyriazos and Poga, 2023)).

$$r_K = \frac{n_c - n_d}{\frac{n(n-1)}{2}} \quad (11)$$

where:

n —number of observations

n_c —number of concordant pairs

n_d —number of discordant pairs

This coefficient is selected due to the absolute frequency of the monitored phenomenon (1,222 cases) and the rejection of the assumption of the normal distribution of the monitored variables. This coefficient measures the ordinal association between two variables based on the difference between the probability of concordant (same direction) and discordant (opposite direction) pairs. Values range from -1 (perfect disagreement) to $+1$ (perfect agreement), with 0 indicating no relationship. The results for the monitored period are shown in Table 1.

Table 1. Results of Kendall coefficients for the entire monitored period 2000–2021.

	A1	A2	A3	A4
A1	1.00	0.80*	0.11*	−0.66*
A2	0.80*	1.00	0.01	−0.71*
A3	0.11*	0.01	1.00	−0.01
A4	−0.66*	−0.71*	−0.01	1.00

* significant at the significance level $\alpha = 0.05$

Source: Own calculations

The above results indicate that the partial overlap of the informative value of the input data is not a problem in terms of the observed significance level for the correlation coefficient. Given the threshold values of the A1-A2 pair, a similar analysis is performed for each year of the observed period; the results are provided in Table 2.

In 2004, we observe a significant rank correlation between the attributes A2-A4 ($r_K = 0.80$), which, however, does not repeat in subsequent years; i.e., from the perspective of the study conducted, this pair does not pose a problem. However, in most of the years evaluated, the results of the pair A1-A2 indicate a Kendall coefficient whose values exceed the set limit. Given that the ceiling for public support (A2) is based on the amount of the investment (A1), these values are expected. If we look at the research by (Annex 1 and Cooray, 2019), they set the threshold at an absolute value of 0.9. If we accept this threshold,

only four years, namely 2005, 2006, 2015, and 2021 (i.e. 25%), it remains “problematic”.

Taking into account the above and the content value of the individual attributes, all four monitored criteria A1, A2, A3, and A4 are used for further research with the weights provided in Table 3).

In the context of the structure of the monitored criteria where investment size effectively dominates the composite (A4), the pooled ranking is calculated (see Table 4).

Table 2. Statistically significant results of the Kendall coefficient of the pair of attributes A1-A2 in the selected years 2000–2021.

2000	2001	2004	2005	2006	2007	2008	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	0.8	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.9
	1	3		1	9	6	2		6	7		9	6	9	4	5	2

Note: The table shows the years in which the absolute value of the correlation coefficient exceeded 0.8.

Source: Own calculations

Table 3. Weights of tracked criteria for all investments from 2000.

criterion	weight
A1	0.283
A2	0.295
A3	0.078
A4	0.342

Source: Own calculations

Table 4. Pooled ranking under (a) equal weights, (b) entropy weights, and (c) A2 omitted and a calculated one.

weights	r_K
equal weights	0.955*
entropy weights	0.369*
A2 omitted weights	0.233*

* statistically significant at the $\alpha = 5\%$

Source: Own calculations

As mentioned above, since 2000, we have recorded a total of 1,222 investments with fully available data. Taking all these cases into account and applying the CV method, we can identify the efficiency coefficient (A4) as the most important attribute, as it has the highest relative variability among the four criteria monitored (see Figure 2). Relative variability is balanced across these attributes with the exception of added value (A3). This is due to its regional nature. However, since the analysis is conducted separately for each of the years evaluated, we have similarly approached the determination of the importance of the four attributes.

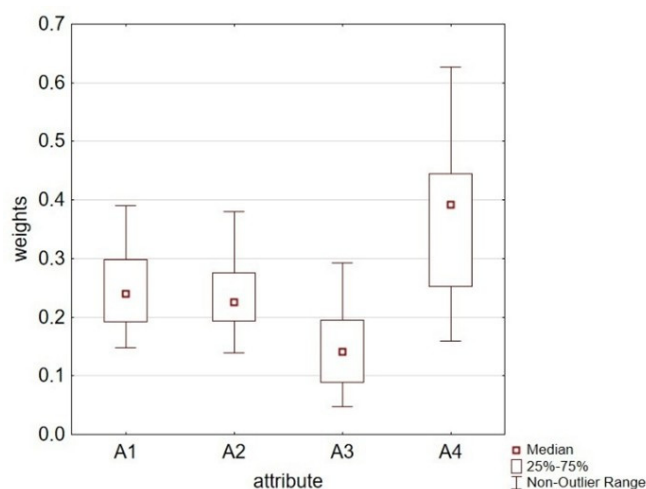


Figure 2. Weights of monitored criteria in individual years.

Figure 2 confirms the previous conclusions, namely that across individual years, attribute A4 has the highest weight and the highest variability. The lowest mean value is observed for attribute A3, although its variability is similar to that of the other criteria. The development of attributes A1 and A2 has been very similar since 2000. The relative variability is highest for the fourth criterion, while the smallest differences in the determined importance can be observed in 2011, 2012, and subsequently in the last years monitored, i.e., 2021.

The results are interpreted in terms of the involvement of companies (investments) in global value chains (GVCs) and their affiliation to the individual regions of the Czech Republic. A more detailed description of these classifications is provided in Annex 1.

4. Results

The results of the study are presented in two parts or steps. In the first step, 1,222 investments are evaluated as a whole; i.e., regardless of the year in which each investment was made. In the second step, attention is given to the separate evaluation of investments in individual years of the monitored period.

4.1. Evaluation of individual investment projects for the monitored period (as a whole)

Individual investments are classified from the perspective of the GVC and according to their affiliation with the individual regions of the Czech Republic separately (see Figure 3).

The level of company involvement (investment) in global value chains, similar to the second monitored identification factor, is balanced or similar in terms of the mean value. In the case of GVCs, we can observe a considerable balance in the results achieved, accompanied by a frequent occurrence of results marked as “extreme values”. The reason for this can be seen in the low range of variation in the results of individual groups or in the low IQR level. We also observe a similar situation from the perspective of affiliation to the individual regions of the Czech Republic, with the occurrence of extreme values showing greater heterogeneity. The combination of both monitored factors is shown in Figure 4.

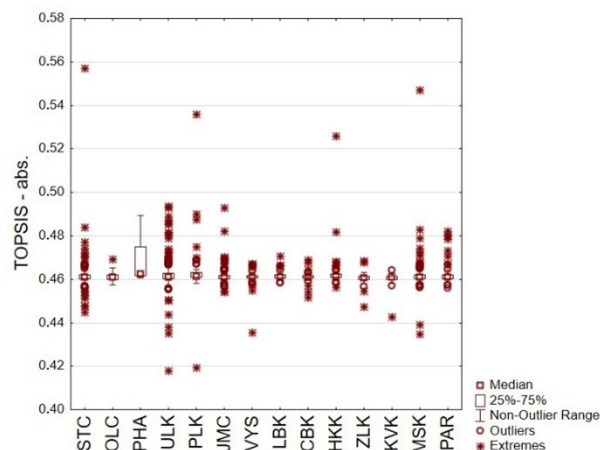


Figure 3. Results of investment evaluation using the CV-TOPSIS technique for the monitored period (as a whole) from the perspective of region-absolute values. Note: The codes used in the classification of investments are contained in Annex 1.

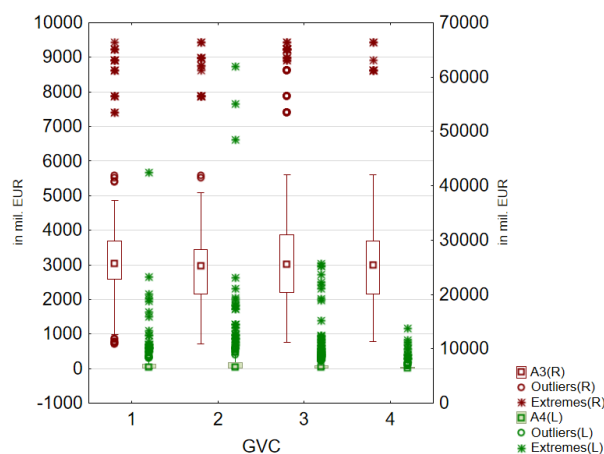


Figure 4. Classification of investment for the entire monitored period (as a whole) from the perspective of the GVC and region-absolute values.

Among the 20 worst-rated companies using the CV-TOPSIS technique, with one exception, we do not find a leading company in the production network ($GVC = 1$), with their primary location being in the Central Bohemian and Ústí nad Labem regions (6 companies in both cases). On the other hand, the top three companies are first-tier suppliers ($GVC = 2$). The Ústí nad Labem Region (6) has a dominant position among the top 20, followed by the Plzeň Region (3). The best-rated leading company in the production network ranked only 35th (ELBEL s.r.o. in the Ústí nad Labem Region, $c_i = 0.472$). Overall, the highest-rated company is FIC CZ s.r.o. ($c_i = 0.557$) from the Central Bohemian Region (see Table 5).

Table 5. TOP10 investments evaluated using the CV-TOPSIS technique for the monitored period (as a whole).

	GVC	Region	Company	c_i
1	2	STC	FIC CZ s.r.o.	0.557
2	2	MSK	KES, spol. s r.o.	0.546
3	2	PLK	Faurecia Plzeň, s.r.o.	0.536
4	1	HKK	ŠKODA AUTO a.s.	0.525
5	3	ULK	Hitachi Home Electronics (Czech), s.r.o.	0.493
6	3	ULK	GRAMMER CZ, s.r.o.	0.492
7	3	JMC	Wistron InfoComm (Czech), s.r.o.	0.492
8	3	PLK	Johnson Controls Automotive Bor s.r.o.	0.490
9	1	PHA	SKV s.r.o./Siemens kolejová vozidla s.r.o.	0.489
10	2	ULK	IPS Alpha Technology Europe, s.r.o.	0.488

c_i —relative distance to PIS alternative (TOPSIS result)

Note: Codes used in the classification of investments are contained in Annex 1.

Source: Own calculations

From the perspective of individual sectors, the low absolute differences are due to the methodological approach and the way of measuring the results of the CV-TOPSIS technique (see Table 6). Based on the mean CV-TOPSIS scores, the three highest-rated sectors are sector 3 (electronics and electrical engineering), sector 1 (biotechnology and medical technology), and sector 15 (production of means of transport). However, the difference lies in the fact that there is a larger number of below-average investment incentives (in the context of the results in the given sector) in sectors 3 and 15, which also show a significantly higher concentration around the aforementioned mean values. The nature of these results is also complemented by the Kruskal–Wallis test ($Q = 144.924$; $p < 0.01$), which confirms statistically significant differences between sectors. By subsequent post-hoc testing, 23.80% of pairs by sector are identified as statistically different. Thus, RH2 is confirmed.

The best-rated suppliers for the period under review are second- and third-tier suppliers located primarily in the Ústí nad Labem Region (see Table 5). However, as these results do not take into account the time factor, in the next step, we will focus on the evaluation of individual years from 2000 to 2021.

The 4th observed factor, i.e., ownership, also proves to be relevant. The Kruskal–Wallis test confirms statistically significant differences at the observed significance level of 5% ($Q = 44.611$; $p < 0.01$). Foreign investment projects receive better evaluation using the CV-TOPSIS technique. Thus, RH4 is confirmed.

Table 6. Classification of investment evaluation results using the CV-TOPSIS technique for the monitored period (as a whole) from the perspective of the sector-absolute values.

sector	average	median	min	max
biotechnology and medical technology (n = 9)	0.464	0.463	0.460	0.468
woodworking and paper (n = 48)	0.459	0.460	0.417	0.481
electronic and electrical engineering (n = 87)	0.466	0.462	0.459	0.557
rubber and plastics (n = 132)	0.461	0.461	0.456	0.484
chemical and pharmaceutical (n = 73)	0.458	0.460	0.435	0.472
IT and software development (n = 13)	0.461	0.461	0.460	0.463
coking and oil processing (n = 2)	0.445	0.445	0.438	0.452
metalworking and metallurgy (n = 141)	0.460	0.461	0.434	0.468
aerospace	0.461	0.461	0.460	0.461
food (n = 53)	0.460	0.460	0.447	0.468
glass (n = 16)	0.458	0.461	0.443	0.462
engineering (n = 145)	0.461	0.461	0.457	0.489
textiles (n = 29)	0.461	0.461	0.456	0.466
production of means of transport (n = 345)	0.463	0.461	0.444	0.547
others (n = 126)	0.460	0.460	0.450	0.482

Note: The codes used in the classification of investments are contained in Annex 1.

Sector 10 (advanced materials) is not reported because no projects in this sector had complete data for all four criteria within the 2000–2021 evaluation period. Two sector 10 projects are recorded in 2023 but were excluded from the research sample because complete data for all four evaluation criteria were unavailable.

Source: Own calculations

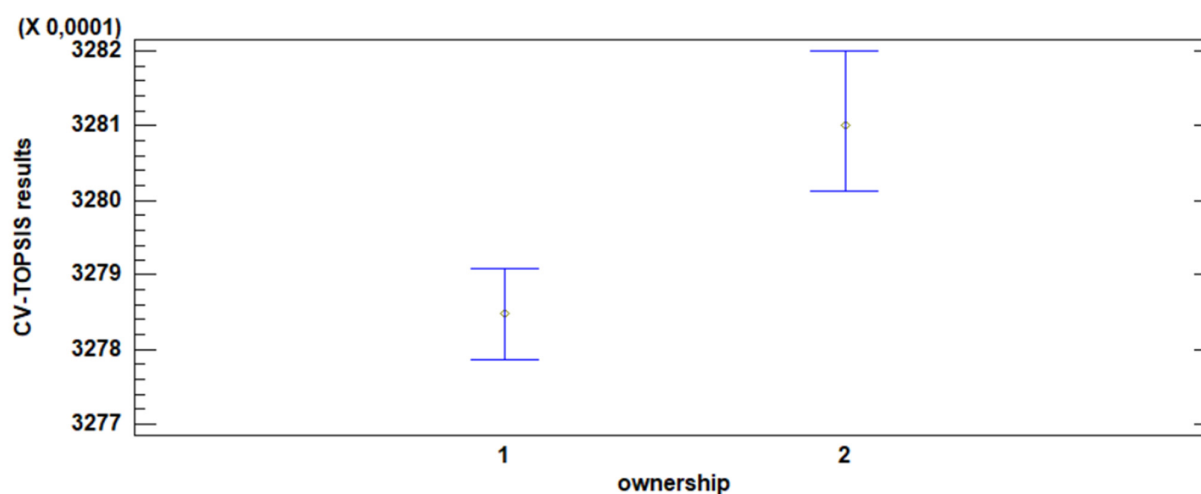


Figure 5. Classification of investment evaluation results using the CV-TOPSIS technique for the monitored period (as a whole) from the perspective of the ownership-median plot with 95% confidence intervals. Note: 1–domestic/Czech ownership, 2–foreign ownership.

4.2. Evaluation of individual investment projects in each year of the evaluation period (2000–2021)

The analysis for each year of the period under review consists of 20 separate analyzes, as it is necessary, in each of these years and among other things, to determine the importance of attributes in the context of their structure across the investments made in that year.

The results are processed from the perspective of the affiliation to individual regions of the Czech Republic as well as the level of company involvement (investment) in global value chains (see Table 7 and Table 8).

Table 7. Best rated investments evaluated using the CV-TOPSIS technique in individual years-classification by region.

	PHA (n = 7)	CBK (n = 61)	JMC (n = 128)	KVK (n = 28)	HKK (n = 63)	LBK (n = 62)	MSK (n = 173)	OLC (n = 78)	PAR (n = 68)	PLK (n = 97)	STC (n = 146)	ULK (n = 179)	VYS (n = 56)	ZLK (n = 76)
2000	0.49	0.48	0.50		0.49	0.48		0.49		0.49	0.50	0.48	0.49	
2001		0.41	0.41	0.41	0.42	0.41	0.42	0.42	0.42	0.28	0.43	0.42	0.43	0.41
2002	0.52	0.42	0.40	0.41	0.41	0.42	0.41	0.43	0.42		0.41	0.41	0.41	0.41
2003						0.16	0.14	0.16	0.13	0.16	0.27	0.17	0.15	0.14
2004		0.47	0.48	0.48		0.48	0.47	0.47		0.48	0.48	0.47	0.47	0.47
2005		0.09	0.08		0.35	0.08	0.10	0.08	0.09	0.09	0.08	0.08	0.10	0.08
2006	0.35	0.35	0.35	0.34	0.42	0.34	0.35	0.34	0.38	0.35	0.34	0.37	0.35	0.34
2007		0.46	0.46	0.46	0.46	0.47	0.45	0.45	0.45	0.46	0.45	0.47		0.45
2008	0.33	0.33	0.35	0.34	0.37	0.36	0.38	0.35	0.38	0.35	0.35	0.40	0.35	0.34
2011		0.43	0.41		0.42	0.41	0.42	0.41	0.49	0.42	0.43	0.46		0.42
2012		0.13	0.37		0.35	0.40	0.34	0.44		0.38	0.29	0.44	0.36	0.36
2013		0.25	0.26		0.26	0.26	0.24	0.25	0.24	0.32	0.26	0.29	0.25	0.26
2014	0.35	0.32	0.35	0.32	0.34	0.33	0.34	0.32	0.33	0.40	0.34	0.36	0.33	0.31

Continued on next page

	PHA (n = 7)	CBK (n = 61)	JMC (n = 128)	KVK (n = 28)	HKK (n = 63)	LBK (n = 62)	MSK (n = 173)	OLC (n = 78)	PAR (n = 68)	PLK (n = 97)	STC (n = 146)	ULK (n = 179)	VYS (n = 56)	ZLK (n = 76)
2015		0.30	0.31	0.28	0.33	0.31	0.34	0.32	0.31	0.33	0.32	0.42	0.31	0.30
2016		0.10	0.09	0.11	0.10	0.11	0.25	0.10	0.13	0.10	0.11	0.14	0.10	0.10
2017		0.12	0.33	0.11	0.12	0.12	0.14	0.13	0.12	0.25	0.11	0.15	0.13	0.11
2018		0.23	0.23	0.25	0.24	0.29	0.27	0.26	0.24	0.24	0.24	0.30	0.23	0.27
2019		0.34	0.22	0.22	0.22	0.24	0.22	0.24	0.18	0.23	0.21	0.21	0.29	0.21
2020		0.16	0.15			0.38	0.25	0.12	0.25	0.25	0.25	0.17		0.20
2021			0.40				0.27	0.38	0.36	0.49		0.36		

Note: The codes used in the classification of investments are contained in Annex 1.

Note: No incentives were granted in 2009 and 2010.

Source: Own calculations

In terms of absolute values, we see significant differences in the average value, which are caused by the dominance of one or a small number of investments in a given year. The overall results are therefore determined by regional affiliation. This conclusion is also supported by the Kruskal–Wallis test ($Q = 34.945$; $p < 0.01$), which confirms statistically significant differences in the median of the results at the level of individual regions of the Czech Republic. The subsequent post-hoc test shows differences in one pair of regions; Pilsen Region and Zlin Region. Thus, RH3 is partially confirmed.

From the perspective of the level of company involvement in global value chains, third-tier suppliers are among the lowest-rated investment projects. Projects classified as leading companies in the production network tend to achieve higher evaluation scores under the CV-TOPSIS framework. This is confirmed by Kruskal-Wallis test at the 5% significance level ($Q = 26.389$; $p < 0.01$). Only the results of third-tier suppliers ($GVC = 4$) turn out to be statistically significantly different. Thus, RH1 is partially confirmed.

Table 8. Best-rated investments evaluated using the CV-TOPSIS technique in individual years-classification by GVC.

	1 (n = 195)	2 (n = 310)	3 (n = 534)	4 (n = 183)
2000	0.50	0.48	0.49	0.49
2001	0.41	0.43	0.41	0.34
2002	0.45	0.41	0.41	0.42
2003	0.15	0.29	0.15	0.15
2004	0.49	0.48	0.47	0.47
2005	0.25	0.09	0.09	0.08
2006	0.34	0.36	0.35	0.34
2007	0.47	0.45	0.46	0.45
2008	0.38	0.36	0.36	0.33
2011	0.44	0.44	0.41	0.41
2012	0.37	0.38	0.40	0.36
2013	0.26	0.29	0.26	0.25
2014	0.34	0.35	0.35	0.33
2015	0.33	0.38	0.31	0.29
2016	0.11	0.16	0.10	0.11
2017	0.12	0.14	0.17	0.12
2018	0.24	0.28	0.25	0.28
2019	0.19	0.23	0.24	0.21
2020	0.38	0.16	0.26	0.16
2021	0.44	0.37	0.35	0.30

Note: The codes used in the classification of investments are contained in Annex 1.

Note: No incentives were granted in 2009 and 2010.

Source: Own calculations

5. Discussion

The results of the analysis indicate that the relative efficiency rankings of investment incentives are associated with a complex combination of factors: structural characteristics of the industry, regional specificities, and the degree of involvement of individual investment projects in global value chains (GVCs). Unlike traditional approaches that assess the impacts of FDI mainly aggregated at the level of GDP or total employment e.g., (Alfaro, 2003; Naughton et al., 2016; Alfaro, 2017), we bring a micro-level perspective using data for 1,222 investment projects implemented in the Czech Republic between 2000 and 2021.

The choice of the methodological framework for this study stems from the need to evaluate a large and heterogeneous set of 1,222 investment projects using a framework capable of working with diverse units and significant data variability. Our approach using the CV method highlights relative variability, which has been applied as a factor for determining the importance of criteria in other research (see the research by Vavrek and Chovancová (2019) or Vaňková and Vavrek (2021)).

The presented research is methodologically aligned with studies applying objective weighting and multi-criteria evaluation techniques (Gokmenoglu and Alaghemand, 2015; Bait et al., 2021; Correa da Cunha et al., 2022; Wanke et al., 2024), which consider this methodological approach useful for policymakers (Gokmenoglu and Alaghemand, 2015), private investors in the industry (Bait et al., 2021), or healthcare facilities (Lin and Tsai, 2010).

The findings indicate that the effectiveness of investment incentives is not directly proportional to the volume of attracted capital. The analysis shows that the highest values of the efficiency coefficient (A4) do not necessarily correspond to investments with the highest volume of capital, but rather to those with higher added value per employee, which are better involved in GVCs or have a lower ratio of public support to benefit. These conclusions are also in agreement with other research (Damborský, 2023) evaluating the effectiveness of investment incentives. These results are consistent with the literature, which calls for a shift from the “quantity” to the “quality” of investments and incentives (Cedidlova, 2013). The relevant quality mechanism is not capital volume, but the capacity of a project to transform capital and public support into technologically and organizationally more complex activities.

A high volume of FDI is not systematically associated with higher relative efficiency rankings within the four-attribute framework applied in this study. The analysis shows that there is significant heterogeneity among individual projects; projects connected to GVCs (especially so-called leading companies and first-tier suppliers) tend to achieve higher relative rankings, while investments isolated from wider supply networks tend to perform less favourably. RH1 is therefore partially confirmed. This association should be interpreted through the depth of supplier embeddedness rather than through GVC membership alone. FDI can contribute to upgrading when network relationships transfer information, production knowledge, and technological requirements to domestic suppliers (Javorcik et al., 2017). Similarly, Driffield et al. (2024) argued that inward investment is more likely to generate broader host-economy benefits when multinational enterprises establish backward and forward linkages with local firms; otherwise, substantial economic activity may remain separated from the surrounding economy. Gereffi et al. (2025) similarly described foreign investment as an “outside-in” mechanism through which emerging economies may accumulate technological capabilities, provided that industrial policy also strengthens domestic suppliers and limits strategic vulnerabilities.

The results are consistent with the broader literature on the development of FDI in CEE. The positive effects of FDI differ by sector and are most pronounced in high-tech industries, where strong linkages between foreign and domestic firms are observed (Alfaro, 2017; Havránek and Hampl, 2018; Tkalenko et al., 2022). The results obtained (see Table 6) indicate that the three sectors with the highest mean CV-TOPSIS scores are electronics and electrical engineering (sector 3), biotechnology and medical technology (sector 1), and production of means of transport (sector 15).

These findings indicate that sectors with higher technological complexity achieve higher relative efficiency rankings within the CV-TOPSIS framework. RH2 is therefore confirmed. The results also indicate that regional differences play a significant role in the effectiveness of investment incentives (see Table 7). Investments in economically stronger regions achieve higher relative efficiency rankings, while peripheral regions tend to underperform (Stojčić and Orlić, 2020). In peripheral regions, lower efficiency rankings are observed, which is consistent with the literature on uneven regional development (Massey, 2007). RH3 is therefore confirmed. Projects connected to GVCs show higher efficiency, while investments outside these networks tend to achieve lower performance (Szymczak et al., 2023). However,

strong integration into GVCs does not automatically guarantee long-term benefits, as excessive specialisation may lead to lock-in effects (Antràs, 2020). It also turns out that investments of foreign entities are evaluated better (see Figure 5). RH4 is therefore confirmed.

One of the key findings of the study is the observed association between the degree of investment involvement in global value chains and their relative efficiency ranking. Even strong integration into GVCs is not an automatic guarantee of long-term benefits if the active role of the domestic business sector is missing. According to (Antràs, 2020), excessive specialization within GVCs can lead a country to be locked into low-cost production segments. In the Czech case, this interpretation suggests that future sustainability of FDI-related benefits may depend on structural upgrading toward higher value-added activities.

Taken together, the results suggest a conditional mechanism: Technological capabilities enable firms to perform more complex activities; supplier embeddedness creates channels for knowledge and production requirements to diffuse; institutional and regional capacities determine whether these linkages can be converted into productivity, domestic value capture, and industrial upgrading; and resilience depends on how these networks are configured rather than on foreign integration alone (Thakur-Weigold and Miroudot, 2023; Driffield et al., 2024; Klimek, 2024; Gereffi et al., 2025). These mechanisms provide a theoretically grounded explanation of the observed rankings, but their direct empirical testing requires project-level data on technology, local sourcing, institutional support, and exposure to supply-chain disruptions.

6. Conclusions

The findings contribute to the literature on FDI, regional development, and GVC participation by showing that the relative efficiency of incentivized projects is a multidimensional and context-dependent outcome. The observed patterns are consistent with Location Theory and the core–periphery perspective, because project rankings vary across regional contexts; with GVC Governance and the Resource-Based View, because production-network position and the capabilities required for more complex activities are associated with differences in value creation; and with Institutional Theory, because incentive outcomes depend on the conditions in which supported projects are embedded. These mechanisms provide an interpretation of the observed associations rather than evidence of causal effects. This study provides a comprehensive empirical assessment of investment incentives at the project level, based on a large and detailed dataset and a transparent multi-criteria evaluation framework. Another advantage of this study is that it is based on open data, which enables the results to be used in further research without restrictions.

The analysis offers a relative efficiency-based comparison of projects across sectors, regions, and levels of GVC integration, which can inform future policy evaluation and methodological applications in similar economic contexts. We consider the research aim to have been met; all three research hypotheses have been confirmed.

Across the 2000–2021 period, projects with the highest investment size per job did not systematically achieve the highest composite rankings. Rankings vary across sectors, regions, GVC positions, and years, indicating that investment performance is associated with a configuration of several dimensions rather than with capital volume alone.

The limitations of the study mainly lie in the availability of data. Comprehensive data are not available for investment projects implemented after 2021, and there is a limited possibility of capturing the depth of GVC ties. Gaining more information on GVC linkages and connections between firms across business environments would lead to a more precise identification of potential spillover mechanisms of FDI in the host economy. The application of the Difference-in-Differences Estimation method, which enables the separation of the incentive effect from the effect of the investment, represents a potential direction for future causal research rather than an extension of the current empirical design. Another option is the Fuzzy-set Qualitative Comparative Analysis (fsQCA), which could identify different combinations of investment characteristics associated with high efficiency (equifinality), while panel regression, or Propensity Score Matching could provide stronger evidence regarding the effectiveness of investment incentives.

For policymakers, the results suggest that incentive schemes should prioritize project quality, productivity potential, and supply-chain embeddedness rather than capital volume alone. Although the study is conducted on detailed microdata for the Czech Republic, the methodological framework developed can also be used to evaluate investment incentives and the effectiveness of FDI in other countries. This requires the availability of comparable data on the size of the investment, the amount of public support, added value, and the degree of involvement in GVCs. This is particularly relevant in the business environment of CEE economies, which share similar structural features (the strong role of foreign capital, regional disparities, high production specialisation), and this approach can serve as a replicable evaluation framework for further empirical studies. It thus enables international comparisons of the effectiveness of investment incentives and supports the creation of economic policies based on data and comparable indicators. For managers and investors, the findings suggest that capital scale alone is insufficient and that technological and organisational capabilities, supplier relationships, and the ability to perform higher-value functions may be relevant for project performance.

This study contributes to the empirical economic literature on the effectiveness of investment incentives in three ways: (i) It provides extensive microdata evidence based on 1,222 projects, (ii) it provides a methodologically reproducible multi-criteria assessment based on objective weighting, and (iii) it integrates sectoral, regional, and GVC dimensions in a single analytical framework. These findings can serve as a starting point for further empirical work and as a basis for a more precise and sustainable setting of investment incentives in the context of an open economy.

Author contributions

Sylvie Kotíková: conceptualization, methodology, project administration, resources, supervision, writing original draft, writing–review and editing.

Roman Vavrek: conceptualization, data curation, formal analysis, investigation, methodology, validation, resources, visualization, writing original draft, writing–review and editing.

Use of AI tools declaration

The authors used AI tools (Grammarly) for language editing and grammar review throughout the entire manuscript. The tool was used only to improve language, grammar, and readability and

was not used to generate, analyze, or interpret scientific content. The authors are fully responsible for the content of this publication.

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Conflict of interest

The authors declare no conflicts of interest.

Data availability statement

The study analyzes third-party data obtained from CzechInvest. These data are publicly accessible via the official CzechInvest website at <https://czechinvest.gov.cz/en/For-Investors/Investment-Incentives>.

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