

Classification of Business Location Factors in Spatial and Temporal Dimensions

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Abstract

Research background: Business location factors are crucial determinants of regional attractiveness for enterprises. Their analysis requires consideration of both internal (technology, resources, pollution, products) and external (place-related) properties, as well as the possibility of artificial creation, costs, duration, and long-term effects. The study introduces the concept of PPF-research (past-present-future) to examine the temporal dynamics of location factors.

Purpose: The aim of the article is to systematize business location factors, classify them into internal and external categories, and identify measures by which the state can enhance regional attractiveness for business, including taxation, infrastructure, resource pricing, and qualified personnel.

Methodology: The research applies comparative analysis of location factors, structured classification, and conceptual modeling. It integrates theoretical reasoning with illustrative examples of state policies (e.g., accelerated depreciation, customs duties, administrative decisions on resource pricing) and introduces the analytical framework of “Siamese pairs” of internal and external factors.

Findings: The study identifies that business location factors are interdependent and must be analyzed in pairs. It demonstrates that measures such as infrastructure development, partial compensation of costs, taxation policies, and attraction of qualified personnel can significantly influence business location decisions. The distinction between “cat-technologies” (place-dependent) and “dog-technologies” (labor-dependent) highlights the role of mobility and quality of life in regional development.

Practical implications: The results provide policymakers with a structured framework for designing regional development strategies. They emphasize the importance of stable long-term policies (e.g., customs duties, taxation) and the potential of targeted measures to attract investment and skilled labor. The classification of factors and the PPF-research approach can guide both regional authorities and enterprises in strategic planning.

Originality / value: The article contributes to the theory of business location by introducing the concepts of “Siamese pairs” of factors and PPF-research. It also proposes a novel classification of goods based on location factors, offering a foundation for further empirical studies and policy applications.

Keywords: business location factors; regional attractiveness; PPF-research; internal and external factors; state policy.

JEL classification: R30; L20; O18.

1. Introduction

Proper spatial organization of the economy is an essential component of its effective functioning. In the course of scientific research on existing or substantiated (forecasted) future business location, it is indisputable that identifying location factors is necessary—namely, the reasons that must be taken into account when justifying (forecasting) future placement (answering the question “where?”) or

explaining past or current placement (answering the question “why here?”) of business activity. In the era of globalization and digital transformation, the relevance of studying business location factors is only increasing, as their systematization becomes crucial both for the development of location theory and for the practice of regional economics and regional development policy.

2. Literature review

The literature was selected for its relevance to spatial economics and regional development, including both classical and contemporary sources. Research on business location factors has a long tradition in economic science. Classical works laid the foundations of spatial economics, emphasizing transport costs, resource accessibility, and competitiveness (Weber, 1929; Hoover, 1948; Isard, 1956; Lösch, 1954; Hirsch, 1967; Rokicki, 2018). Subsequent studies expanded the range of determinants to include institutional frameworks, environmental regulations, and regional development (Beckmann, 1968; Brown, 1979; Levinson, 1996; Sternberg & Litzenger, 2004).

In contemporary literature, significant attention is devoted to the impact of globalization, innovation, and digitalization on business location decisions. Fujita and Krugman (2004) discuss the role of new economic geography, while Allen and Arkolakis (2014) analyze trade and spatial topography. Fujita, Krugman, and Venables (1999) provide a systematic account of the interrelation between cities, regions, and international trade. More recent studies emphasize firm-specific and location-specific drivers (Baltounis & Hensher, 2019; Rochell, 2025), the use of spatial big data (Aversa, Hernandez, & Doherty, 2020), and sustainable innovations linked to proximity (Bloise, 2020; Wilke & Pyka, 2025).

Other scholars highlight the importance of clusters and creative industries in shaping regional attractiveness (Strykiewicz, 2010; Sternberg & Litzenger, 2004; Fratesi, 2025), as well as the influence of the digital economy on urban innovation levels (Zhang, Liu, & Yang, 2024). At the same time, research shows that state policy—tax incentives, customs duties, and compensation mechanisms—remains a crucial instrument in shaping business conditions (Blair & Premus, 1987; Torre & Rallet, 2005; Bourdin & Torre, 2025).

Despite this extensive body of work, no prior studies have proposed a systematic division of business location factors into internal (properties of the “business” side) and external (properties of the “place” side), nor their analysis in temporal dimensions—past, present, and future. This article introduces such a classification and develops the concept of PPF-research (past-present-future), filling an important gap in the literature.

3. Methods

3.1. Research Approach

This study applies a method of systematization and classification of business location factors. The analytical framework is based on a comprehensive review of scientific publications covering both classical and contemporary concepts of spatial economics.

3.2. Analytical Logic

The methodology involves:

- dividing location factors into internal (business-related characteristics) and external (place-related characteristics),

- examining them across temporal dimensions: past, present, and future (PPF approach),
 - synthesizing results to develop a conceptual model of the spatial organization of business activity.
- The procedure of systematization involved grouping factors into internal/external categories and mapping them across past, present, and future dimensions. Building on this methodological approach, the following section introduces the key findings derived from the analysis.

4. Results and discussion

The findings of the study are presented in the form of a systematic classification of business location factors. Table 1 introduces the division of location factors into internal (attributes of the “business” side) and external (attributes of the “place” side), as well as their distribution across past, present, and future categories. This classification highlights the dynamic nature of business location decisions and provides the basis for further analysis.

Table 1. Dimensions of Business Location Factors

Spatial dimension of business location factors	Temporal dimension of business location factors		
	Past	Present	Future
Internal	inpa	inpr	infu
External	expa	expr	exfu

Source: authors’ own elaboration.

Table 1 illustrates the dual dimensions of business location factors. The spatial dimension distinguishes between internal (attributes of the “business” side) and external (attributes of the “place” side). The temporal dimension categorizes these factors into past, present, and future. The abbreviations (inpa, inpr, infu, expa, expr, exfu) denote internal–past, internal–present, internal–future, external–past, external–present, and external–future factors, respectively.

This framework provides the foundation for analyzing the technological, resource, and environmental properties that shape business location decisions. Building on this classification, the following section explores how specific attributes of technology, resources, pollutants, and goods influence location choices.

The study of business location factors should reasonably begin with an analysis of the properties of the technology intended to be used for the production of a good. Technology can be defined as a spatial–temporal system of combining resources for the production of goods. It is the resources and the norms of their utilization that identify and distinguish a given technology. Every technology also requires a highly specific resource—place. If technology is considered spatially fragmented, where the production of a good involves several process locations, then all these places are regarded as resources necessary for the functioning of the technology. Each place, from the perspective of potential localization of the respective technology, should be analyzed in terms of the availability of the required resources and their cost.

It should be emphasized that, in addition to desired goods, the functioning of technology also produces so-called undesired goods (waste), which cannot be used as resources under existing conditions due to technical constraints or economic inefficiency. Each technology is characterized by the timing and volume of pollution generated during its operation. Clearly, information about pollution resulting from the application of a technology could be considered within the framework of production costs by including expenditures on compliance with environmental regulations. However, places may differ in their mechanisms of environmental regulation, which necessitates location-specific

calculations of such costs. Therefore, the component of production costs that accounts for expenditures on compliance with environmental standards in a given place should be considered separately.

If, based on purely technological considerations, we previously argued that each potential location for a given production technology should be analyzed in terms of the availability and cost of the required resources, then with the inclusion of the environmental pollution factor, the requirements for location analysis expand. An additional component of analyzing a place for the localization of a technology characterized by a relatively high level of pollution generation becomes the specifics of state environmental policy related to that place (for example, the level of state requirements regarding environmental impact, the mechanisms of sustainable development implementation), as well as the level of expenditures on pollution prevention in accordance with the state's environmental policy. These environmentally induced costs may concern the evaluated technology directly and/or the technologies already operating in the region, if the concept of a compensatory strategy is implemented there (where new enterprises must offset their emissions by reducing pollution at other, existing enterprises in the region) or a strategy of environmental quality improvement (where the region sets the goal of reducing anthropogenic environmental pollution).

Thus, the properties of technology—namely, the timing and volume of resource utilization during the implementation of the technological process, as well as the timing and volume of pollution generated—are factors that must be taken into account when choosing a location for the production of a good. By compiling an ordered list of technological characteristics (properties), we obtain:

1. The moment in time when the need for resources or the generation of pollution arises.
2. Which resource is required at the specified moment.
3. How much of the specified resource is needed.
4. What type of pollution is generated at the specified moment.
5. The volume of pollution generated.

Hence, there arises a need for information about the characteristics (properties) of the resources used in the course of the respective technological process, as well as the characteristics (properties) of the pollution generated by the application of this technology. Thus, following the analysis of the characteristics (properties) of the technology, there will be a need to analyze the characteristics (properties) of its corresponding resources and pollutants.

A resource is everything that can be used in the technological process for the production of goods. Clearly, the characteristics (properties) of resources are extremely diverse, and each of them may be evaluated in terms of its impact on localization. Such properties include, in particular:

- mobility (the possibility of being moved to the required place) or immobility (the impossibility of being moved to the required place),
- physical state (solid, liquid, gaseous),
- safety (in storage, transportation, and use),
- specific weight, etc.

It should be emphasized that labor resources (including the individual who makes the decision on business location) also belong to the category of resources, with their own specific properties. The properties of resources may, in turn, influence business location decisions.

The characteristics (properties) of pollutants are diverse, including:

- physical state (solid, liquid, gaseous),
- level of aggressiveness,
- level of toxicity,

- duration of “life”,
- distance of dispersion, etc.

The properties of pollutants may, in fact, become factors influencing business location.

A good is the material or intellectual result of the functioning of technology. The characteristics (properties) of goods are extremely diverse, including, in particular:

- mobility or immobility,
- physical state (solid, liquid, gaseous),
- safety (in storage, transportation, and use),
- specific weight,
- susceptibility to spoilage, etc.

The properties of goods may also become factors influencing business location.

The properties of technologies, their corresponding resources, pollutants, and goods together form the properties of the “business” side (Fig. 1).

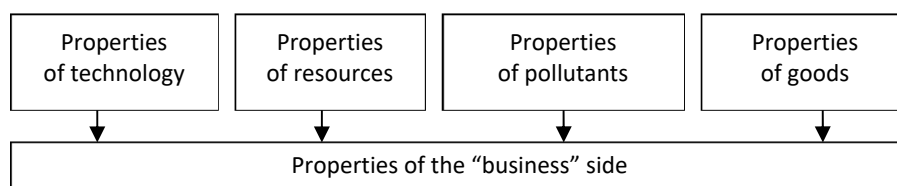


Figure 1. Components of the properties of the “business” side

Source: authors’ own elaboration.

Figure 1 summarizes the components of the “business” side, showing how technologies, resources, pollutants, and goods jointly define its properties. This structure makes it possible to establish direct correspondences with place properties, which in turn form the basis for identifying location factors.

The properties of the “business” side determine the suitability of orienting the business toward locations that possess corresponding qualities. For example, the property of a business such as “bread baking” — “rapid loss of product quality” — makes it appropriate to orient location toward places that possess the quality of “geographical proximity to consumers.” There is a dependency between the properties of business and the properties of locations, since each property of business will correspond to some property of place.

Let us focus on the properties of places. A place is a part of space where something or someone can be located. The characteristics (properties) of places are extremely diverse, including, in particular:

- location in relation to markets,
- accessibility,
- environmental quality,
- availability of resources,
- resource prices,
- bearing capacity of soils,
- geometric parameters,
- legal aspects,
- neighborhood,
- susceptibility to destructive natural impacts, etc.

It is evident that the properties of a place may become factors influencing business location.

When establishing the correspondence between the properties of the “business” and “place” sides and the factors of location, it should be emphasized that only a portion of the properties actually become factors of business location. In other words, there are properties of the “business” side, some of which may turn out to be location factors. These determine which places are appropriate to seek for business location. Each property of the “business” side will correspond to a certain property of the “place” side, which should likewise be considered a location factor. Thus, in every case, when answering the question “where?” or the question “why here?”, it is necessary to identify not individual location factors but their pairs (which may be called “Siamese”): an internal location factor – an external location factor (Table 2).

Table 2. Formation of “Siamese” pairs of location factors

Code of the property of the “business” side	1	2	...	n
Code of the corresponding property of the “place” side	x	y	...	z
Code of the “Siamese” pair of location factors	1-x	2-y	...	n-z

Source: authors’ own elaboration.

The formation of “Siamese” pairs demonstrates that business and place properties cannot be considered in isolation. Their interdependence highlights the need to evaluate business location factors as integrated combinations rather than separate determinants.

It is evident that each specific case of business will be characterized by a set of properties of the “business” side and the corresponding properties of the “place” side. The task then is to identify places with such a combination, which will be considered potential locations for business placement. Table 3 presents examples of “Siamese” pairs of location factors.

Table 3. Examples of “Siamese” pairs of location factors

Property of the “business” side	Property of the “place” side
Rapid loss of product quality	Location near consumers
Resource immobility	Availability of resource
High resource intensity	Availability of resource
Low transportation costs of the good	Low production costs of the good
Vulnerability to polluted environment	High environmental quality

Source: authors’ own elaboration.

These examples illustrate how practical business properties correspond to place characteristics, creating pairs that directly influence location decisions. Such pairs provide a basis for assessing the strength of influence, feasibility of artificial creation, and long-term implications of location factors.

Both external and internal factors of business location can be characterized by their strength of influence, as well as by the possibility of artificial creation, cost, and duration. The strength of influence of business location factors is, evidently, different for various combinations of the “business” side and the “place” side, and is determined by their impact on the indicator adopted as the criterion for location choice. Here it is appropriate to distinguish three levels of influence: decisive (as in the case, for example, of immobile resources or immobile goods), important (25–75% influence on the criterion of location choice), and ordinary (up to 25% influence).

As for the artificial creation of business location factors, this opens up an entire field for scientific activity. First, not all business location factors are subject to such creation. Second, it is evident that greater opportunities for artificial creation of location factors exist on the “place” side, although the “business” side may also have potential for this, and the very use of such potential may provide promising, non-obvious perspectives in planning the location process. Third, the artificial creation of

business location factors will require financial and time expenditures, which automatically creates the need to justify the economic feasibility of such actions.

Regarding the issue of artificially creating business location factors, it is evident that the experience of state influence on stimulating regional development provides many examples of business location factors of an artificial nature. According to the criterion of the object of state influence, measures for the artificial creation of business location factors can be divided into four groups (Fig. 2).

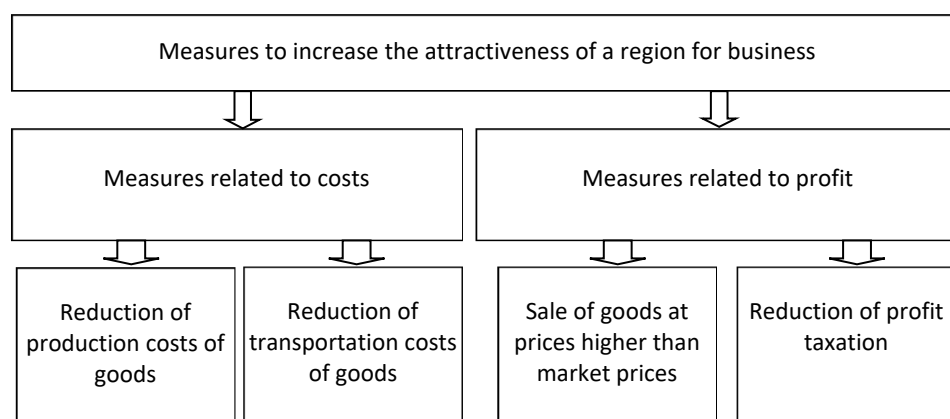


Figure 2. Classification of measures to increase the attractiveness of a region for business

Source: authors' own elaboration.

The classification of state measures emphasizes that regional attractiveness can be shaped through cost reduction, profit incentives, and resource creation. This framework connects theoretical classification with practical policy instruments, bridging the gap between abstract factors and applied strategies.

Measures that would reduce production costs of goods when locating business within a region may concern one-time (investment) and current expenses. The reduction of investment costs when locating business within a region is possible through:

- infrastructure development of the territory financed by the state,
- partial compensation by the state of investment costs (including expenses for purchasing a land plot necessary for business),
- reduction of taxable profit for business entities investing in the respective region.

The reduction of current expenses may be achieved by lowering the prices of resources necessary for the production of goods, as well as by reducing costs associated with the delivery of these resources. The state can lower resource prices through the adoption of appropriate administrative decisions (for example, regarding wage levels or rental rates for premises) and by partially compensating current expenses. The reduction of costs associated with resource delivery concerns, above all, transportation and storage expenses, as well as customs duties and value-added tax. The state can reduce costs related to resource delivery by adopting appropriate administrative decisions (primarily concerning customs duties and value-added tax, but partly also transportation and storage expenses) and by partially compensating transportation and storage costs. Similarly to current production expenses, the state may also reduce costs of delivering goods to consumers. This may occur either through administrative decisions on lowering transportation prices for goods produced in the respective regions, or through partial compensation by the state of transportation expenses.

Considering the ambiguity of state policy in price regulation, especially in the form of administrative decisions, the measures mentioned can be recommended only in cases where they concern enterprises

that are natural monopolies. This is quite a large sphere of the economy, which includes both the production of many important resources and the provision of various transport services.

Measures that would allow goods produced in a region to be sold above market prices may fall into two categories. First, the state could adopt an appropriate administrative decision requiring relevant state structures to purchase the goods they need (for example, for the state's reserve funds or to meet the needs of budgetary institutions) specifically from enterprises located in the respective region. It is evident that certain price limits must apply in this case: for instance, purchasing goods from producers in the respective region if the price does not exceed the market level by more than 30%.

Second, by artificially restraining competition (for example, through the introduction of high customs duties on the import of relevant goods), the state can create conditions for selling goods produced in a certain region at prices higher than market prices. Clearly, in this case there arises the problem of determining the optimal level of customs duty rates at which support for regional development would not be accompanied by an increase in the prices of the respective goods beyond an acceptable level. It should also be emphasized that business location decisions are made with a focus on long-term results. Therefore, the state's customs policy, if it aims to have a guaranteed influence on business location, must be based on the application of customs duty rates that remain stable over a comparatively long period of time.

We still need to analyze measures aimed at reducing profit taxation. Despite the apparent simplicity of this direction, it contains many different options. First of all, it is evident that this direction includes the policy of reducing (or even abolishing) profit taxation for enterprises located in a problematic region. However, profit taxation can be reduced not only directly but also indirectly through an appropriate tax-depreciation policy (as distinct from accounting depreciation). Thus, the state may pursue a policy of accelerated depreciation of fixed assets of enterprises located in the region. At the same time, the policy of accelerated depreciation (in the amount of investments in the respective region) may apply either only to the profit earned by enterprises located in the region, or to the total profit of the firm that made the investment. Clearly, the application of accelerated depreciation policy (in the amount of investments in the respective region) to the total profit of the firm is more attractive for potential investors than applying this policy only to the profit earned by enterprises located in the region.

An extremely important measure of the state to increase the attractiveness of regions for business is the creation of the resource "qualified personnel" (through targeted training of specialists or their attraction from other regions and countries). When characterizing technologies from the perspective of location, one can speak of "cat-technologies" and "dog-technologies". This terminology derives from the long-established fact that "a cat becomes attached to a place, while a dog becomes attached to a person." Accordingly, "cat-technologies" are more oriented toward immobile business location factors (availability of resource sources, infrastructure, climate), while "dog-technologies" are not closely tied to place, and their location strongly depends on qualified workers, who are a rather mobile resource. The attraction of highly qualified personnel is often associated with expectations of accelerated development of regions that lack other business location factors. Places with a high quality of life attract highly qualified workers and, consequently, become attractive for "dog-technologies".

As for the artificial creation of internal business location factors (technology, resources, pollution, products), the possibilities are significantly smaller, but they do exist. A producer may choose to change the production technology (for example, producing cement by the dry rather than the wet method, which may neutralize the factor of cheap water resources in location decisions), replace certain resources (for example, using electricity instead of natural gas, which may neutralize the factor

of cheap gas in location decisions), use environmentally friendly raw materials (for example, coal with lower sulfur content, which may neutralize the factor of low costs of emission prevention or the factor of low environmental requirements), or orient toward areas with a positive image for prospective consumers of the product (for example, environmentally clean regions for agricultural production, which may neutralize the factor of low production costs).

It is evident that, in order to decide on the feasibility of artificially creating an internal or external business location factor, one must know the financial costs and duration, as well as the economic effect of such measures. At the same time, one should not expect to obtain universal recommendations, since everything will depend on the specifics of the region and the industry.

Business location factors should be studied over time (as they were in the past, as they are now, and as they may be in the future), for which the term PPF-research (from English past-present-future) can be proposed. It is clear that business location factors in PPF-research will always concern places and production technologies of specific goods. Therefore, one can speak of PPF-research of places, PPF-research of technologies, and, if necessary, PPF-research of industries (understood as producers of identical goods within a certain spatial unit, such as a region, a country, etc.). Since the production of identical goods may be carried out using different technologies, PPF-research of an industry will simultaneously be PPF-research of the technologies used in that industry for the production of the respective good.

5. Conclusions

The conducted research allows us to draw several key conclusions regarding the nature and classification of business location factors. These conclusions highlight both the theoretical contribution of the study and its practical implications for regional development strategies.

1. Business location factors are reasons that must be taken into account when justifying (forecasting) future location (answering the questions “where?” – “where to locate?”, “where will it be located?”) or explaining past or current location (answering the questions “why here?” – “why was it located here?”, “why is it located here?”).
2. The properties of the “business” side comprise the properties of: technology (production of goods), resources (used for the production of goods), pollution (generated in the production of goods), and the good (which is the goal of the technological process). The properties of the “business” side determine the appropriateness of orientation toward places with corresponding properties.
3. Business location factors can be divided into internal (corresponding properties of the “business” side) and external (corresponding properties of the “place” side). In each case, when answering the question “where?” or “why here?”, one should identify not separate location factors, but their “Siamese” pairs: internal and external location factors.
4. Business location factors are characterized by strength of influence, possibility of artificial creation, cost, and duration. The strength of influence of business location factors differs across various combinations of the “business” side and the “place” side, and is determined by their impact on the indicator adopted as the criterion for choosing a location.
5. Not all business location factors can be artificially created: greater possibilities for this exist on the “place” side. Artificial creation of business location factors requires financial and time expenditures, which automatically creates the need to justify the economic feasibility of such measures.

6. Business location factors can be studied over time (PPF research): as they were in the past, as they are now, and as they may be in the future. PPF research may concern places, technologies, and, if necessary, industries.

Overall, the proposed framework not only advances the theoretical understanding of business location factors but also provides practical guidance for policymakers and enterprises seeking to enhance regional competitiveness in a dynamic economic environment. The proposed classification also has direct practical applicability for regional authorities and enterprises, serving as a tool to design strategies that strengthen territorial competitiveness. Moreover, the conceptual model may be empirically tested in the future on selected industries or regions, which would provide valuable validation of its usefulness.

Further research is promising with respect to “Siamese” pairs of location factors for different types of business, as well as PPF research of places, technologies, and industries. An important direction may also be the development of a classification of goods according to production location criteria.

In this way, the study provides a coherent foundation for both theoretical advancement and applied strategies, while offering a solid basis for future empirical validation.

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