

## BUILDING COMPETITIVE ADVANTAGE OF PUBLIC UNIVERSITIES IN NON-METROPOLITAN CITIES UNDER BANI CONDITIONS

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**Purpose:** This article identifies sources of competitive advantage of public universities located in non-metropolitan Polish cities under BANI conditions, using the LTR analytical framework (location, technology, relations) as an interpretative tool for understanding institutional resilience in response to environmental uncertainty.

**Design/methodology/approach:** A qualitative, document-based multiple case study analysis examines four public universities located in Piotrków Trybunalski, Kalisz, Słupsk, and Siedlce. The LTR framework is applied to extract strategic priorities from institutional and municipal development documents, supplemented by an international analytical counterpoint to assess the scalability of the framework.

**Findings:** The analysis reveals that non-metropolitan universities follow a defensive-adaptive strategy rather than replicating metropolitan patterns. Through the LTR lens, institutional resilience is built via Location, which stabilizes well-being and mitigates anxiety (Anxious); Technology, which enables organizational agility and navigation of non-linear challenges (Non-linear); and Relations, which anchor universities in their local ecosystems and address incomprehensible complexity (Incomprehensible). The synergy of these three dimensions contributes to gaining a competitive advantage, buffering universities against organizational brittleness (Brittle).

**Research limitations/implications:** The qualitative focus on declarative strategic documents—adopted intentionally—limits the scope for generalization. Future research should quantitatively examine the relationship between LTR synergies and performance indicators such as graduate career tracking (ELA) and regional economic effects.

**Practical implications:** The LTR analytical framework offers a diagnostic tool for policymakers, indicating that regional universities should prioritize contextual specialization over the mechanical imitation of metropolitan development models.

**Social implications:** As anchor institutions, public universities in non-metropolitan cities play a critical role in regional resilience, acting as buffers against brain drain and long-term regional weakening in a BANI environment.

**Originality/value:** The paper introduces an original LTR analytical framework to the study of regional public universities under BANI conditions, shifting analytical attention from organizational scale to strategic synergy.

**Keywords:** Competitive advantage, Public universities, BANI, Non-metropolitan cities, LTR analytical framework.

**Category of the paper:** Research paper.

## 1. Introduction

Contemporary higher education operates under conditions of dynamic, unpredictable, and difficult-to-interpret change, commonly described through the concept of the BANI world (Brittle, Anxious, Non-linear, Incomprehensible) (Le Roux, Sutton, 2022). This framework highlights profound disruptions to stability, increasing uncertainty, and the growing complexity of processes affecting institutional functioning. For public universities, these conditions necessitate the development of new adaptive capacities, including organizational flexibility and the ability to identify and leverage alternative sources of competitive advantage.

Existing research on the competitiveness of higher education institutions in Poland has focused primarily on large academic centers located in metropolitan cities such as Warsaw, Kraków, Wrocław, Poznań, and Gdańsk, or on large non-metropolitan cities (e.g., Olsztyn, Opole, Zielona Góra, Bielsko-Biała, Radom, Tarnów, Włocławek) (Rokita-Poskart, 2015). Significantly less attention has been devoted to public universities operating in medium-sized non-metropolitan cities—understood here as cities with populations of up to 100,000—despite the fact that these institutions perform important social, economic, and cultural functions and often serve as key anchor institutions for local development (Harris, Holley, 2016; O’Farrell et al., 2022; Craig, 2025).

Although previous studies have analyzed the role of academic functions in local development strategies in a medium-sized city (Kalisz) and a small city (Nysa) (Rokita-Poskart, 2015), as well as a case study of Grudziądz, a city without a public university (Nalaskowski, Dejna, 2020), these analyses focused primarily on urban strategies and higher education institutions in general, rather than on public universities and their institutional strategies. Furthermore, these studies did not take into account the conditions of the BANI world, in which smaller, more cohesive urban systems may have clear advantages in terms of stability, quality of life, and greater capacity for coordinated action.

At the same time, non-metropolitan cities and the universities operating within them face a range of structural challenges, including limited labor markets, restricted access to resources, weaker positions in national and international rankings, and difficulties in attracting academic staff. In the context of declining student demand and intensifying inter-university competition, identifying sources of competitive advantage that are not derived from metropolitan status has become a critical strategic task.

The higher education literature increasingly emphasizes the importance of universities’ adaptive capacities, manifested in organizational agility (Menon, Suresh, 2020), the development of dynamic capabilities (Heaton et al., 2019; Guerrero, Menter, 2024; Liao, Suprpto, 2024), selective digital transformation (Mohamed Hashim et al., 2022; Alenezi, Akour, 2023), and relational collaboration with the socio-economic environment (Knop, Papież-Pawelczak, 2023). However, these approaches are rarely subjected to empirical analysis

in relation to public universities operating outside metropolitan centers, particularly under conditions of uncertainty and non-linearity characteristic of the BANI world.

This article seeks to demonstrate that a key factor in building competitive advantage for public universities located in non-metropolitan cities is the synergistic use of three interrelated dimensions that gain particular significance under BANI conditions: Location (L), Technology (T), and Relations (R).

The purpose of this study is to analyze the ways in which public universities located in non-metropolitan cities can build competitive advantage under BANI conditions, with particular emphasis on the synergy among these three dimensions. The article employs an author's original analytical framework of competitive advantage for non-metropolitan universities that integrates internal organizational capabilities with external relationships embedded in the urban environment. As points of reference, the University of Warsaw (as a national analytical counterpoint) and the University of Cambridge (as a global analytical counterpoint of a university located in a medium-scale university city) are used, enabling comparison across national, European, and global dimensions.

## **2. Literature Review**

### **2.1. The BANI World: The Concept and Its Relevance to Higher Education**

The concept of the BANI world, proposed by Jamais Cascio in 2020 (Cascio, 2020), represents both an extension of and an analytical correction to the VUCA model. Cascio argues that VUCA no longer adequately captures the nature of contemporary social, economic, and technological conditions, the intensification of which has become particularly evident in recent years (Hrynychak, Motuzka, 2023). This is especially true in the case of global disruptions such as the COVID-19 pandemic, supply chain interruptions, accelerated digitalization, and the escalation of socio-political tensions. BANI thus characterizes reality as Brittle (B), Anxious (A), Non-linear (N), and Incomprehensible (I), necessitating a redefinition of traditional models of organizational management.

Unlike the VUCA framework, which focuses primarily on the analysis of current phenomena, the BANI concept emphasizes the future-oriented nature of uncertainty and the multidimensionality of ongoing processes (Miernik, 2023). Introducing this perspective reshapes approaches to systemic resilience, organizational flexibility, and adaptive capacity—issues that are particularly salient in the higher education sector.

Polish higher education experiences all components of the BANI world, with particularly strong effects on regional universities. Institutions operating in non-metropolitan cities exhibit high sensitivity to system brittleness (B) resulting from limited demographic bases, as well as

anxiety (A) driven by lower brand recognition and the heterogeneous conditions of local labor markets. At the same time, conditions of non-linearity (N) in development processes, regional universities may mitigate through selective digitalization, which reduces the negative effects of peripherality. In turn, the incomprehensibility (I) of complex market relationships may be reduced by their stronger social embeddedness in the ecosystems, in which they function. The BANI framework provides a useful interpretive lens for analyzing development strategies of universities located in non-metropolitan cities.

## **2.2. Non-Metropolitan Cities as the Institutional Environment of Universities**

Analyzing the development conditions of public entities, including universities, requires a precise definition of their operating environment, which in the case of smaller urban centers differs fundamentally from that of large metropolitan agglomerations. Contemporary scholarship has increasingly moved away from strictly administrative boundary definitions in favor of a functional approach. A key concept in this regard is the Functional Urban Area (FUA), which comprises the urban center and its commuting zone, where—according to international standards—at least 15% of the working population commutes to the city (Dijkstra et al., 2019; EUROSTAT, 2017). This approach makes it possible to capture the actual spatial reach of a city's influence beyond its formal administrative borders.

Despite ongoing efforts toward methodological harmonization, international comparisons remain challenging due to differences in demographic and administrative criteria (United Nations, 2025). Institutions such as the OECD and Eurostat classify urban areas primarily on the basis of population size, distinguishing between large metropolitan areas, metropolitan areas, medium-sized urban areas, and small urban areas (OECD, 2014), a distinction that is also reflected in U.S. classification systems (NCES, 2023). In the Polish context, a four-tier typology is commonly applied, differentiating between small, medium-sized, large cities, and metropolitan areas, with the metropolitan threshold typically set at populations above 500,000 (Magazyn Miasta, 2025; Rogalińska, 2024).

For the purposes of this study, the category of “non-metropolitan cities” is defined broadly to include urban centers with county-level status whose populations fall below the metropolitan threshold of 500,000. However, in line with the research objective, the analysis focuses on a specific subgroup within this category—medium-sized cities with populations of up to 100,000. These cities function as local service and administrative centers but lack the infrastructural complexity and agglomeration advantages characteristic of major growth poles. In Poland, their development trajectories are strongly shaped by unfavorable demographic trends, including depopulation and brain drain, as well as limited access to investment capital (Rogalińska, 2024).

Differences between metropolitan and non-metropolitan cities are also evident in local labor markets. Market analyses indicate that while metropolitan areas are characterized by very low unemployment rates, strong wage pressure, and intense competition for workers, smaller urban

centers tend to exhibit more stable and differentiated labor market conditions (Business Insider, 2025).

From the perspective of university strategic management, operating in such an environment creates a unique contextual setting that, under BANI conditions (Brittle, Anxious, Non-linear, Incomprehensible), takes on a dual character. On the one hand, the smaller scale of the city may generate structural brittleness, manifested in a stronger dependence of universities on the financial condition of local governments and businesses. On the other hand, this environment may help reduce incomprehensibility as it facilitates the development of more durable, trust-based stakeholder relationships—relationships that are considerably more difficult to establish in anonymous metropolitan contexts. Consequently, non-metropolitan status should not be viewed solely as a resource deficit but rather as a distinct contextual condition that requires alternative models for building competitive advantage by public universities.

### **2.3. The Higher Education System in Poland and Its Spatial Differentiation**

The higher education system in Poland is characterized by a high degree of institutional and spatial differentiation. According to data from Statistics Poland (GUS, 2025), more than 352 higher education institutions operated nationwide. A key distinction within the system is between academic universities and professionally oriented institutions, the latter focusing primarily on teaching activities.

As of July 7, 2025, the Polish public higher education sector comprised 103 institutions, of which 64 were supervised by the minister responsible for higher education, while the remaining institutions were overseen by sectoral ministries, including culture, health, and national defense (RADON, 2025). An analysis of their spatial distribution reveals a clear process of metropolitan concentration: among academic universities, only four institutions operate in medium-sized cities, whereas the remaining 61 are located in major urban centers (MEN, 2025).

This spatial distribution also affects access to educational offerings. The highest concentration of study programs is observed in Warsaw (1,312 programs), followed by Kraków (996), Poznań (662), Wrocław (650), Lublin (510), Łódź (492), Szczecin (405), and Gdańsk (396) (MEN, 2025). This pattern reflects the historical centralization of research and academic activity, which for decades has been concentrated in the largest metropolitan areas.

The concentration of academic programs in major metropolitan centers is also mirrored in the higher academic potential of these cities, as measured, for example, by the City Academic Index developed by the Polish Economic Institute (PIE, 2023). Strong universities contribute to population growth, strengthen human capital, and attract investment, while simultaneously benefiting from the development of infrastructure and labor markets. These relationships are bidirectional: cities with higher levels of socio-economic development are more likely to host universities ranked highly in national and international assessments, while dynamic universities further stimulate urban growth (Dębowska et al., 2023; Kozień, 2021).

Against this background, public academic institutions located outside major metropolitan centers face particularly complex institutional and spatial operating conditions. This context forms the empirical basis of the study. The analysis focuses on four public academic institutions supervised by the minister responsible for higher education and science and located in non-metropolitan cities, which constitute the entire population of such institutions in Poland.

As the literature highlights, these universities operate under conditions that can be interpreted through the BANI framework; however, previous studies have addressed these challenges in a rather fragmented manner. To address this research gap, the study adopts a conceptual model based on three interrelated dimensions of competitive advantage: location, technology, and relations (LTR).

### 3. Methods

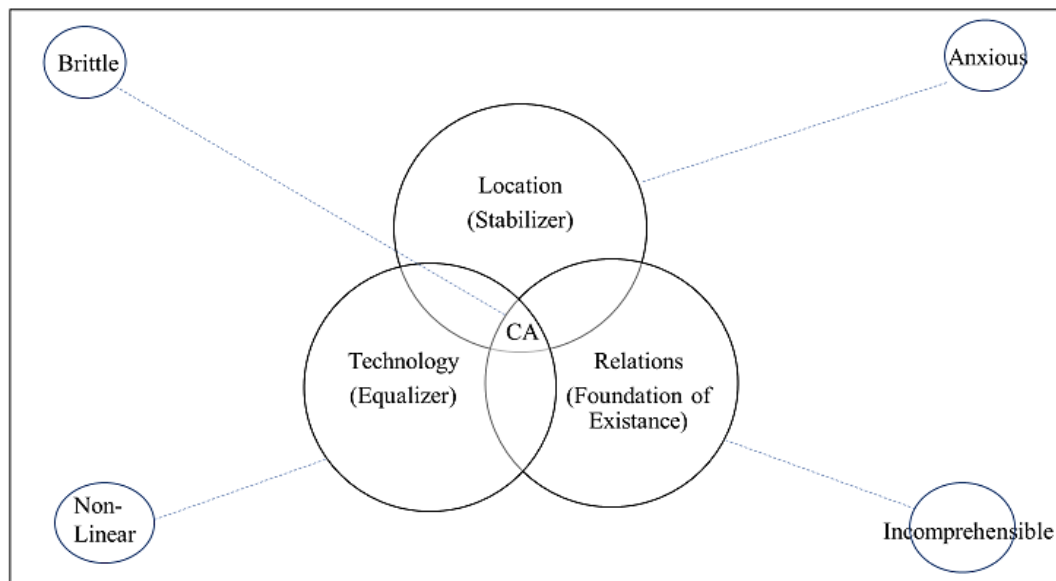
#### 3.1. The LTR Analytical Framework and Variable Operationalization

To diagnose the competitive position of the units under study, an original LTR analytical framework was employed, specifically adapted to the characteristics of non-metropolitan centers. At its core, the framework is built around a conceptual model which posits that competitive advantage (CA) under conditions of uncertainty (BANI) is the outcome of the synergy among three dimensions: Locational (L), Technological (T), and Relational (R). This relationship is expressed heuristically as a multiplicative conceptual model, allowing for the recognition of the complementary character of the L, T, and R dimensions (Figure 1):

$$CA = L \cdot T \cdot R \quad (1)$$

(as opposed to  $CA = L + T + R$ )

This conceptual structure assumes that in non-metropolitan contexts, a critical deficit in one area (e.g., lack of digitalization or isolation from the surrounding environment) cannot be fully compensated by a surplus in another, resulting in a loss of competitive capability. The equation serves a heuristic and conceptual purpose and does not represent a quantitative estimation.



**Figure 1.** The LTR conceptual model of synergistic competitive advantage as a response to BANI – related challenges.

Source: own study.

The framework's variables were operationalized as follows (Table 1):

**Locational Dimension (L)** – grounded in J. Barney's (1991) Resource-Based View (RBV) – was defined in a dual perspective as the university's internal infrastructure (tangible resources, quality of study environment: campuses, dormitories) and the surrounding environment's potential (quality of life, safety, cost of living).

**Technological Dimension (T)** – based on D. Teece's (1997, 2007) Dynamic Capabilities framework – is understood as the level of digital maturity of both the city (Smart City) and the university (e-services, hybrid education), as well as the ability to reconfigure digital resources by both the city and the university.

**Relational Dimension (R)** – drawing on Network Theory (Burt, 1992) and social capital concepts (Coleman, 1988; Putnam, 2000) – is defined as the intensity and quality of collaboration with local stakeholders (municipal authorities, businesses, NGOs), creating shared interpretive frameworks in the city-university/university-city relationship.

**Table 1.**

*Characteristics of the Three Dimensions of the LTR Analytical Framework under BANI Conditions*

Dimension	Description	Factors	Role	BANI Elements
<b>Locational</b>	Quality of life – environmental stability	Moderate cost of living, proximity to nature, slower pace of life, low "information noise," lower ecosystem complexity	Compensates for non-metropolitan status; enhances attractiveness for students and faculty seeking stability and high quality of life	Reduces anxiety (A) and serves as a stabilizer in the face of environmental brittleness (B)

Cont. table 1.

<b>Technological</b>	Digitalization – organizational agility	Adaptability, capacity to leverage mature digital systems, hybrid learning models, automation of administrative and student processes	Mitigates geographical distance from metropolitan centers; strengthens adaptability and transformative capabilities	Key for responding to process non-linearity (N) and building resilience to environmental brittleness (B)
<b>Relational</b>	University–city / city–university collaboration – creating shared sense-making structures	Strategic partnerships, joint infrastructural and cultural projects, co-development of study programs aligned with local needs, investments in academic environment attractiveness, coordination among local actors	Builds a local knowledge ecosystem; enhances resilience through networking; fosters a university identity rooted in the city	Critical for managing environmental incomprehensibility (I) and environmental brittleness (B)

Source: own study.

While each dimension of the LTR framework addresses specific sources of uncertainty under BANI conditions, it is their synergistic interaction that generates competitive advantage, which functions as a buffering mechanism against organizational brittleness rather than as a simple sum of individual effects.

The conceptual model defined above constituted the core of the analytical framework used to interpret the collected empirical data and structure the results of the present study.

### 3.2. Methodological Assumptions

The study was conducted using a qualitative document-based multiple case study, drawing on strategic documents (development strategies) from four public academic institutions located in non-metropolitan cities: Piotrków Academy in Piotrków Trybunalski, Kalisz University in Kalisz, the Pomeranian University in Słupsk, and the University of Siedlce. The study adopted an exhaustive sampling strategy regarding public academic universities located in non-metropolitan centers.

The content analysis of these documents was structured around three categories derived from the author's LTR analytical framework, which served as the interpretive matrix for the study:

L (Locational dimension: location and quality of life/study environment).

T (Technological dimension: technology and digitalization).

R (Relational dimension: city–university / university–city relations).

The LTR analytical framework was employed as a tool to operationalize the key dimensions that, according to the author, influence the development of universities in non-metropolitan cities. This research procedure enabled a systematic comparison of the content of university and city strategies, as well as the identification of patterns in their collaboration, developmental priorities, and approaches to building competitive advantage.

To broaden the contextual scope, an additional comparative dimension was introduced, including the University of Cambridge (UK) as a model example of a non-metropolitan academic ecosystem with global reach, and the University of Warsaw as a reference point for universities operating in metropolitan contexts.

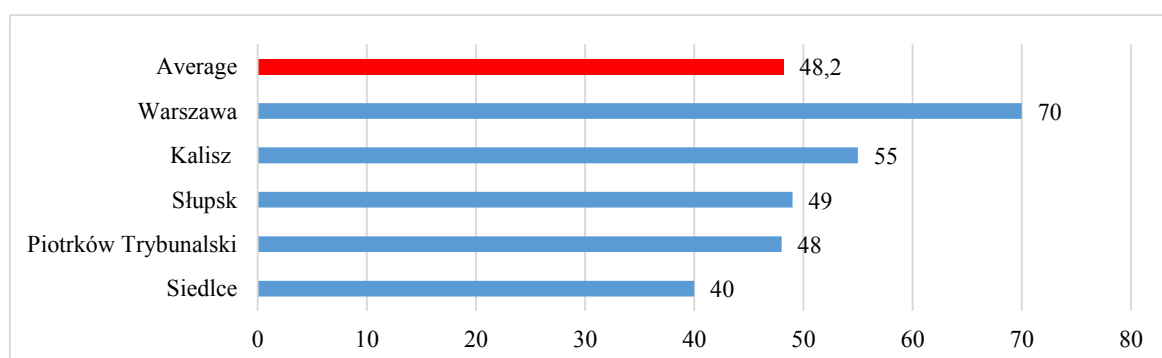
It should be emphasized that the University of Cambridge was not employed in this study as a benchmark in terms of financial scale or academic prestige, but rather as a paradigmatic example of functional integration between a university and a mid-sized city. It provides justification for the assertion that non-metropolitan location can serve as a foundation for global competitiveness if the synergy mechanisms (L·T·R) are fully leveraged.

The multiple-case study approach allowed for the comparison of strategies of universities located in non-metropolitan cities with selected national and international counterpoints. The application of the LTR analytical framework enabled the systematic identification of similarities, differences, and developmental conditions arising from locational, technological, and institutional relational factors, as well as their potential to foster growth in a BANI world.

## 4. Results

### 4.1. Characteristics of Selected Non-Metropolitan Cities in Poland

The cities hosting the selected universities occupied diverse positions in the 2018 ranking of county-level cities published by *Polityka*. The ranking highlights significant disparities in quality of life across Poland – from the highest-rated cities, such as Sopot, Warsaw, and Kraków, to considerably lower scores for medium-sized cities, including Kalisz, Słupsk, Piotrków Trybunalski, and Siedlce. This underscores the necessity for these centers to build competitive advantage from a so-called “low starting point” (Figure 2).



**Figure 2.** Overall Quality of Life Index for selected county-level cities in 2018.

Source: own study based on the Ranking miast powiatowych według poszczególnych kategorii, 2018: <https://www.polityka.pl/niezbednik/rankingmiast/1597033,1,ranking-miast-powiatowych-wg-poszczegolnych-kategorii.read?categoryId=1>

In the context of the development of higher education institutions, both a city's location and its socio-economic potential are of critical importance. An analysis of four Polish county-level cities—Piotrków Trybunalski, Kalisz, Słupsk, and Siedlce—demonstrates how local government authorities conceptualize the role of universities. Based on the dominant cooperation mechanisms identified within strategic planning documents and following the adopted methodology, four specific relationship models were distinguished and categorized according to the dimensions of the LTR framework:

### **1. Piotrków Trybunalski – The Economic Niche Support Model**

The city has a population of 66,211 (Polska w liczbach, 2025) and serves as a subregional transport hub within the Łódź Voivodeship. It leverages its strategic location at the intersection of the A1 motorway and the S8 express road, as well as its proximity to the Łódź airport (Urząd Miasta Piotrków Trybunalski, 2022). Analysis of strategic documents indicates a focus on economic niches, as reflected in the dimensions of the LTR framework:

**Location (L):** Within the adopted categorization, this area includes actions aimed at compensating for "big-city deficits" through revitalization (Goal 1.4) and the development of "blue-green infrastructure", such as the revitalization of the Bugaj reservoir area (Goal 2.3). These efforts are interpreted as an attempt to enhance the city's attractiveness as a place of residence for both academic staff and students.

**Technology (T):** Analysis of this dimension reveals a focus on energy transformation and the circular economy (Goal 2.1). A key element is the functioning of the Digitization and Organizational Supervision Office, alongside the implementation of specific tools like the E-BOM mobile app and local IT support points (Urząd Miasta Piotrków Trybunalski, 2022). This creates the necessary infrastructure for implementation-oriented research.

**Relations (R):** A rare feature identified in local government documents is the direct inclusion of university support within operational goals (Goal 3.1: "Support for the development of higher education institutions"), specifically regarding the transformation of the Piotrków Academy. This is complemented by plans to establish a business incubator supporting R&D initiatives (Goal 2.1).

The strategy of Piotrków Trybunalski seeks to reduce brittleness (B) by closely linking academic functions with economic priorities.

### **2. Kalisz – The Urban-Academic Symbiosis Model**

Kalisz, with 92,533 residents (Polska w liczbach, 2025), is strategically located between the metropolises of Łódź, Wrocław, and Poznań. The city represents a model characterized by the full incorporation of academic goals into the development strategy (Urząd Miasta Kalisza, 2022), driven by the strong potential of local institutions (Kalisz University, Adam Mickiewicz University in Poznań – Kalisz Branch, Uniformed Services Campus of the University of Justice).

Location (L): The strategy implements the "compact city" concept, with a particular emphasis on the "Kalisz for Youth" program, which provides students and graduates with access to municipal housing (Goal 2.5). Within the LTR framework, this is interpreted as a response to student anxiety (A) regarding the high cost of living in metropolises.

Technology (T): Development in this area is based on the Smart City concept, including the introduction of e-service platforms and enhancing the digital competencies of municipal officials. The focus on energy efficiency (Goal 7.1) provides a modern environment for university operations.

Relations (R): The core element is the explicitly defined Operational Goal 4.1: "Academic Kalisz," along with projects such as "High Quality of Education." The analysis identifies this as evidence of treating the university as a primary partner in urban transformation and a provider of human capital for investments (Goal 5.1).

The Kalisz model is based on symbiosis: the city provides modern infrastructure and living conditions, while the university provides human capital.

### **3. Słupsk – The Quality-of-Life Compensation Strategy**

Located in the Pomeranian Voivodeship, Słupsk has 85,135 residents (Polska w liczbach, 2025) and serves as a regional center for education and services. The city's strategy (Urząd Miasta Słupsk, 2022) is based on a compensation mechanism—deficits in metropolitan infrastructure are offset by "soft" resources.

Location (L): The identified priority is resident retention through housing development (Direction 2.3) and a rich leisure offer (Direction 1.8). These actions aim to build an attractive "Student Lifestyle" to counter the gravitational pull of larger metropolises.

Technology (T): This dimension is pursued through the goal of "energy independence" (Direction 4.3), which serves as a direct response to the non-linearity (N) of energy prices and supplies in a BANI world. Simultaneously, the modernization and digitization of administrative services (Direction 1.5) elevate the standard of service for student-residents.

Relations (R): The Pomeranian University in Słupsk is treated as a central urban-forming entity. In this dimension, the city positions itself as a hub for modern business services (Goal 3), expecting the university to profile its graduates to meet the specific needs of the service sector and regional integration (Direction 3.1).

### **4. Siedlce – The Formalized Partnership Model**

Siedlce with 75,072 residents (Polska w liczbach, 2025) is a hub in the Masovian Voivodeship aspiring to the role of a subregional center for education and culture. Strategic analysis (Urząd Miasta Siedlce, 2015) indicates that the city builds its advantage through formalized cooperation structures.

Location (L): The analysis points to a development model based on strengthening central and academic functions (Goal 2.2) and improving quality of life through housing (Goal 4.3), which offers students stability and predictability in a BANI world.

Technology (T): The focus is on ICT infrastructure development, including increasing bandwidth and implementing e-services (Goal 4.5), providing the technical foundation for a modern economy.

Relations (R): A distinguishing feature is the support for lifelong and practical learning and the promotion of the city's academic brand. The strategy emphasizes the formalized integration of educational activities with the potential of universities, including support for academic cultural ventures, which serves as a way to mitigate the incomprehensibility (I) of procedures and the environment.

The Siedlce model is conservative yet resilient—it assumes the evolutionary development of academic functions as an integral, internal part of the urban socio-economic ecosystem.

#### 4.2. Development Strategies of Public Higher Education Institutions in Non-Metropolitan Cities – A Case Study

A comparative analysis of the development strategies of the studied institutions, cross-referenced with data on their market positioning, enables the empirical verification of the LTR framework's assumptions.

##### 4.2.1. Strategic Baseline: Rankings and Graduate Labor Market Outcomes

The comparison of ranking positions (Table 2) confirms the hypothesis of a 'low initial standing' for the institutions under study. In global rankings, such as Webometrics, institutions with established brands (Siedlce, Słupsk) occupy lower-tier positions (exceeding 8000), whereas recently transformed entities (Piotrków, Kalisz) exhibit limited visibility or are entirely absent from specific databases (e.g., EduRank). This can largely be attributed to their relatively short period of operation under new legal frameworks, which delays comprehensive indexing by ranking algorithms. Furthermore, the scale of their operations (900 – 5245 students) deviates significantly from the selected analytical counterpoints, such as the University of Warsaw (approx. 35,000 students) and the University of Cambridge (approx. 25,000 students). This disparity necessitates the pursuit of competitive advantage through factors other than economies of scale

**Table 2.**

*Ranking performance of the analyzed higher education institutions in EduRank 2025 and Webometrics 2025*

University	EduRank 2025	Webometrics 2025	Total students
University of Cambridge	2 (Europe) 2 (UK)	10 (World) 2 (Europe) 2 (UK)	24 912
University of Warsaw	93 (Europe) 1 (Poland)	368 (World) 140 (Europe) 1 (Poland)	35 425
Piotrków Academy	Not indexed*	Not indexed*	900
Kalisz University	Not indexed	11747 (World) 275 (Poland)	4000

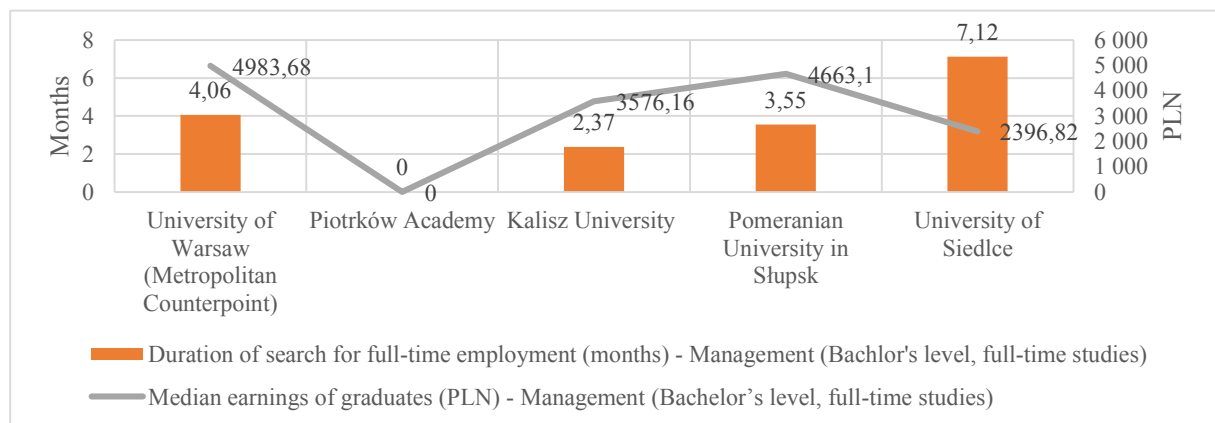
Cont. table 2.

<b>Pomeranian University in Słupsk</b>	1835 (Europe) 80 (Poland)	9382 (World) 2007 (Europe) 98 (Poland)	3000
<b>University of Siedlce</b>	1043 (Europe) 62 (Poland)	8405 (World) 1849 (Europe) 91 (Poland)	5245

\* The lack of data may be attributable to the brief duration of the institution's operation under its current nomenclature and legal status (following its succession from the UJK Branch), which precludes comprehensive algorithmic indexing.

Source: own study based on the EduRank, 2025, Webometrics, 2025, University of Cambridge. Information Hub (as of 01.12.2024), Uniwersytet Warszawski. *Dane statystyczne – Studenci*, 2024 (as of 31.12.2024), Gosławska, 2024, Latarnik Kaliski, 2024.

Analysis of data from the Polish Graduate Tracking System (ELA, 2023), presented in Figure 3, provides insights into the functioning of the studied institutions within their local ecosystems (Dimension R).



**Figure 3.** Recruitment data and graduate labor market outcomes (median earnings and job search duration) for the analyzed institutions.

Source: own study based on the Ogólnopolski System Monitorowania Ekonomicznych Losów Absolwentów Szkół Wyższych (ELA, 2023).

Data from the Polish Graduate Tracking System (ELA, 2023) are used in an illustrative and contextual manner and do not constitute a basis for causal inference. Their role is to complement the qualitative findings by providing descriptive insight into graduate outcomes within local labor markets.

The salary landscape highlights the distinct specificities of non-metropolitan markets. The median earnings of graduates from the studied institutions, ranging from 2,396.82 PLN to 4,663.1 PLN, are nominally lower than the average for metropolitan hubs such as Warsaw (4,983.68 PLN). However, when interpreting this data through the lens of Dimension L (Locational) and the relatively lower cost of living in Siedlce, Słupsk, or Kalisz, the real purchasing power of graduates remains at a satisfactory level, which encourages regional retention.

In BANI conditions, the key indicator of success proves to be employment stability and the speed of entry into the workforce, rather than the salary amount alone. As shown in the chart, the duration of the first full-time job search is relatively short, averaging less than 2.5 months (Kalisz University graduates) and approximately 3.5 months (Pomeranian University in Słupsk graduates). This suggests high local market absorption capacity and an effective alignment of the educational offering with the needs of regional employers.

Low unemployment rates among graduates and short job search durations confirm that the studied universities serve as local economic stabilizers. In contrast to metropolises, where the "rat race" for positions generates high levels of Anxiety (A), graduates of non-metropolitan institutions benefit from a relation premium (Dimension R), quickly finding employment through local business and institutional networks.

A notable exception is found among graduates of the University of Siedlce (UwS), whose full-time job search exceeds 7 months, with median earnings being the lowest among the institutions studied. This phenomenon can be tentatively linked to the specific configuration of the L and R dimensions. Unlike other regional centers with similar student populations, such as Kalisz or Słupsk, where the job search duration is significantly shorter (approx. 2.5 and 3.5 months, respectively), the situation in Siedlce may potentially reflect a periodic saturation of the local labor market. Furthermore, it can be hypothesized that the unique economic gravity of Warsaw induces a 'selective search' effect; graduates from UwS may prioritize longer-term aspirations for the metropolitan market over immediate local employment. Thus, these results may reflect ambitious career strategies rather than institutional inefficiency, although this interpretation would require further verification.

#### *4.2.2. University Development Strategies Through the LTR Lens*

A detailed analysis of strategic documents reveals diverse models of adaptation to BANI conditions. It should be emphasized that while these strategies are multifaceted and extend beyond the scope of this study, the application of the LTR conceptual model as an original analytical tool allowed for the identification and extraction of those priorities that determine the building of competitive advantage in non-metropolitan centers.

Under this research filter, the content analysis process enabled the mapping of fragmented strategic provisions onto specific components of the model:

In the area of Location (L): Identified goals concern the modernization and expansion of physical infrastructure, building spatial autonomy (particularly important for new entities), and improving the quality of life and architectural accessibility of the campus.

In the area of Technology (T): Selected provisions cover the digitization of management and administrative processes, the implementation of modern didactic tools, and the construction of specialized R&D centers serving as a technological base for the region.

In the area of Relations (R): Extracted mechanisms include institutional cooperation with businesses and clusters, formalized collaboration with local governments, and the fulfillment of the university's "Third Mission" as a cultural hub.

This research procedure does not imply that the LTR framework exhausts the entire content of the studied documents; rather, it serves as a high-precision tool for distilling the key determinants of institutional resilience.

The following results present the operationalization of the LTR analytical framework using specific examples from the studied institutions.

### **1. Piotrków Academy – Priority: Infrastructural Autonomy**

The analysis of the *Development Strategy for 2024-2028* (Akademia Piotrkowska, 2025) indicates a concentration of efforts on building subjectivity after years of operating as a branch.

Location (L): This dimension is defined as a physical struggle for the institution's own space. Under Priority 5 ("Structure"), the document explicitly points to the need to mitigate "decades of neglect" and "imprudent management of the former branch's assets". The thorough modernization of buildings has thus become a key operational goal, forming the foundation of the university's new identity and ensuring its physical autonomy.

Technology (T): Treated instrumentally as a support for pedagogy (Priority 2: "Education"). The strategy assumes intensive improvement of distance learning methods to enhance the attractiveness of the lifelong learning offer and reach students beyond the traditional recruitment area.

Relations (R): Identified in the document as a *conditio sine qua non* for development. In Priority 4 ("Cooperation with the Environment"), the university declares its commitment to increasing the city's competitiveness, while Priority 3 ("Entrepreneurship") assumes the commercialization of research through special purpose vehicles (SPVs) to achieve financial independence and market integration.

### **2. Kalisz University – Model: Cluster Integration**

The university's strategy (Uniwersytet Kaliski..., 2021) stands out for its strong profiling toward specific economic sectors of Southern Greater Poland.

Location (L): Built on two levels: improving living conditions (modernizing dormitories under the goal "Increasing the Attractiveness of Housing Offer") and branding activities. The planned relocation of the university authorities to the prestigious National Bank of Poland (NBP) building aims to symbolically and functionally anchor the university in the city's elite center.

Technology (T): Forms the foundation of research specialization. The development of the Monoprofile Medical Simulation Center and the R&D Center is not merely an equipment investment but a strategic positioning of the university as an advanced technological back-end for the region.

Relations (R): This is the most strongly outlined dimension. The university institutionalizes cooperation through targeted "participation in economic clusters", explicitly mentioning the aviation and food clusters. Thus, the university acts as an R&D department for the Kalisz-Ostrów Agglomeration. This is complemented by social initiatives (Children's University, University of the Third Age) building intergenerational bonds.

### **3. Pomeranian University in Słupsk – Strategy: Digital Transformation**

The mission and strategy (Academia Pomorska w Słupsku, 2021) emphasize modern management, reflecting its recently attained university status.

Location (L): Focus on territorial expansion—the strategy assumes the creation of a Field Research and Teaching Station, physically extending the center's reach. Simultaneously, efforts are made to build the brand as a strong, autonomous center in Central Pomerania.

Technology (T): The dominant dimension in management. Strategic documents detail the implementation of Electronic Document Management (EZD) systems and IT tools for financial control. In research, technology supports the digitization of the region's natural resources (the *Herbarium Pomeranicum* project), serving as a unique research differentiator.

Relations (R): Based on formalized advisory structures. A key mechanism is the establishment of Employers' Councils at the institutes, ensuring market verification of curricula. Another vital element is the "Third Mission", positioning the university as the city's primary cultural center.

### **4. University of Siedlce – Model: The Accessible University**

The strategy through 2025 (Uniwersytet w Siedlcach, 2019) strongly emphasizes inclusivity, stability, and social responsibility.

Location (L): The priority is "universal design" and ensuring full architectural accessibility for people with special needs. The internal dimension of location is reinforced by employee wellbeing—the strategic goal "The University as a Friendly and Secure Employer" aims to build staff stability in an uncertain environment.

Technology (T): Understood pragmatically as streamlining financial and administrative systems and developing library infrastructure (Main Library and Scientific Publishing House), providing a workshop base for researchers and students.

Relations (R): Oriented toward the labor market (strategic goal "High Quality of Education") and tracking graduate outcomes. The strategy also assumes the intensification of international research cooperation, complementing strong traditional ties with local government and business.

## **5. Discussion**

The strategic review and market position analysis of the examined institutions enable the formulation of generalized conclusions regarding the mechanisms for building competitive advantage. The subsequent discussion interprets these findings through the lens of the LTR conceptual model components, the BANI framework, and the existing literature. To bridge the gap between specific case study observations and generalized conclusions, Table 3 provides

a synthesis of the identified strategic archetypes, which serve as the foundation for the following analysis.

**Table 3.**

*Synthesis of Strategic Priorities: The LTR Framework Perspective*

Institution	Dominant Dimension	Strategic Profile (Archetype)	Key Actions (Documentary Evidence)
<b>Piotrków Academy</b>	L (Location)	Restoration of Autonomy	The priority is to regain institutional agency after operating as a branch. Emphasis is placed on "building modernization" (Priority 5) and developing internal infrastructure to ensure independence from the central headquarters.
<b>Kalisz University</b>	R (Relations)	Industrial Integration	The strategy is strictly aligned with economic clusters (aviation, food). Goal: "Participation in cluster activities", which positions the university as an R&D hub for regional industry.
<b>Pomeranian University in Słupsk</b>	T (Technology)	Systemic Digitization	Strong emphasis on e-management (EZD – electronic document management, financial control – Objective 1.3). Technology is treated as a tool for streamlining processes and enhancing organizational efficiency.
<b>University of Siedlce</b>	L and R (Location and Relations)	Inclusivity and Openness	"Accessible University" strategy (universal design). Goal: "The university as a friendly employer". Building competitive advantage through wellbeing and staff stability. Strategic Goal "Cooperation with the Environment"

Source: own study based on the strategic documents of analyzed universities.

The analysis confirms that under BANI conditions, the studied institutions do not replicate metropolitan models. Their strategic actions, interpreted through the lens of the LTR framework, demonstrate high alignment with its dimensions and focus on institution-specific deficits or assets (Table 3). For emerging centers (Piotrków), the priority is the physical infrastructure and autonomy (L); for those with technological aspirations (Słupsk), it is the digitization of management processes (T); and for those deeply integrated with industry (Kalisz), it is cluster networking (R). Conversely, for institutions with a social profile (Siedlce), inclusivity and fostering environmental stability (Land R) become paramount. Applying the LTR framework as an interpretive tool leads to the conclusion that the common denominator for all studied entities is the treatment of relationality as a key driver of institutional resilience.

The subsequent discussion interprets these findings through the lens of the LTR conceptual model components, the BANI framework, and the existing literature.

### **5.1. The Significance of Location (L): Redefining Competitive Advantage Through Quality of Life and Study**

The analysis confirms the fundamental role of location, as classically identified by M. Porter (1990, 2000); however, in the specific context of non-metropolitan cities, this factor takes on a new meaning. Research results suggest that, in accordance with O. Kethüda's typology (2021), the competitive advantage of smaller centers is no longer determined solely by 'hard'

geographical parameters, but rather by 'soft' assets: place attractiveness, safety, and quality of life.

For the studied institutions, this translates into a strategic focus on "Quality of Study" as a locational advantage. As evidenced by the "Restoration of Autonomy" archetype at Piotrków Academy and "Accessible University" at University of Siedlce (Table 3), Location (L) may lead to creation of sense of belonging, academic stability and well-being both students and academic staff. These observations align with the findings of Livina and Rozentale (2020), which indicate that in an era of uncertainty (BANI), well-being becomes a crucial strategic resource determining the decisions of students and talent alike.

It should be noted that this trend has significantly intensified in the post-pandemic era. The widespread adoption of hybrid work models and the rising popularity of the 'slow city' and work-life balance concepts have radically increased the attractiveness of non-metropolitan centers. These hubs offer a high quality of life at a relatively lower cost of living, providing a tangible argument in the competition for human capital.

Comparing the positions of the studied cities—such as Kalisz, Słupsk, or Siedlce—in quality-of-life rankings (Ranking miast powiatowych według poszczególnych kategorii, 2018) with their academic potential leads to the conclusion that a 'low start' in national rankings need not be a barrier; rather, it serves as a point of departure for strategic redefinition. Unlike metropolises, with their 'rat race', the analyzed cities can build an advantage based on social well-being indicators (Statistics Poland, 2024). In the LTR framework, this serves as a response to the Anxiety (A) and Brittleness (B) of the environment.

A further significant conclusion from the analysis concerns the role of the local labor market. In contrast to saturated metropolitan markets, smaller centers offer greater stability and lower competitive pressure (Business Insider, 2025). For regional universities, this presents an opportunity to build more durable relationships with employers, confirming the thesis that local attractiveness within the L (Location) dimension must be actively cultivated.

## **5.2. The Technological Dimension (T) as a Tool for Organizational Resilience**

In the context of the BANI environment, the findings suggest that digital transformation in smaller centers is ceasing to be merely a technical challenge and is becoming a key tool for building organizational resilience (Mohamed Hashim et al., 2022). Although the level of digitization within the institutional environment of smaller cities varies (Miazga et al., 2022), the organizational agility of smaller universities allows them to adapt hybrid solutions more rapidly than is the case in complex metropolitan structures. The "Systemic Digitization" archetype identified at the Pomeranian University in Słupsk (Table 3) illustrates that technology (T) is not just an administrative add-on, but a way to mitigate geographic peripherality. It should be noted, however, that this potential agility of smaller units is not a permanent trait; rather, it depends on a proactive management stance and budgetary flexibility. In this context,

technology (T) emerges as a strategic opportunity, the full realization of which requires overcoming internal cultural barriers within the organization.

The necessity of addressing the needs of 'digital natives' (McHaney, 2011; Budde-Sung, 2011) compels the studied institutions to implement personalization and immediacy within their educational processes. Analysis indicates that virtualization (MOOCs, open access) serves as a strategic equalizer for non-metropolitan universities, effectively mitigating geographic barriers. Furthermore, the utilization of technologies such as Big Data and Cloud Computing in institutional management (Mazurek, 2019) allows for more effective prediction and error elimination. In light of the LTR framework, the technological dimension (T) not only supports pedagogy but also constitutes a direct response to the non-linearity (N) of the environment.

### **5.3. University-City Relations (R): Moving Beyond the Triple Helix Model**

Analysis of the development strategies of the studied cities indicates that university-environment relations are evolving. The observed actions—comparable to initiatives in leading hubs (e.g. Urząd Miejski Wrocławia, 2025), as well as specific strategies of the analyzed centers (Siedlce, Słupsk)—demonstrate that contemporary innovation ecosystems are increasingly integrating civil society (Quadruple Helix) and the environmental perspective (Quintuple Helix) (Carayannis, Campbell, 2010).

Practical reflections of this multi-level integration are exemplified by the "Industrial Integration" archetype identified at Kalisz University, the "Openness" archetype of University of Siedlce (by among others "Cooperation with the Environment") (Table 3) or Herbarium Pomeranicum project conducted by Pomeranian University in Słupsk. It combines the advanced digitization of natural resources (T) with broad knowledge dissemination to the public (R), thereby achieving scientific, educational, and environmental goals within a single ecosystem.

These findings correspond with the City Academic Index (PIE, 2023), confirming a bidirectional relationship: a strong university stimulates demographics and the labor market, while a developed city attracts academic talent (Dębkowska et al., 2023; Kozień, 2021). In the case of non-metropolitan cities, this symbiosis is particularly evident—the university serves as an anchor institution, and its collaboration with business is a prerequisite for curbing brain drain.

The anchor institution role should not be idealized, as its effectiveness remains contingent upon regional absorptive capacity, institutional resources, and the quality of inter-organizational coordination.

These partnerships, by enhancing institutional image and ranking positions (Bogacz-Wojtanowska et al., 2022), grant universities access to external resources, which underscores the efficacy of the LTR analytical framework in smaller academic centers.

#### 5.4. International Context: Evidence Verifying the Analytical Framework

The significant impact of universities on the development of non-metropolitan cities is a globally observed phenomenon, confirming the universality of the conclusions derived from the LTR analytical framework. International case studies demonstrate that metropolitan status is not a prerequisite for success:

Cambridge (Massachusetts, USA): A city with a population of approximately 118,000 (NCES: medium city), where the presence of Harvard and MIT has fostered a powerful innovation ecosystem (City of Cambridge MA, 2025; MIT, 2023).

Cambridge (United Kingdom): A center with approximately 152,000 inhabitants (ONS: large towns/smaller cities), serving as the core of the "Silicon Fen" cluster (Cambridge City Council, 2025).

Stanford (California, USA): A small census-designated place (approx. 21,000 residents) whose global influence stems from the synergy between the Stanford University and the City of Palo Alto (City of Palo Alto, 2025).

These examples demonstrate that the factors determining a university's global standing are independent of urban scale. For the "digital native" generation, the physical scale of an academic center is becoming secondary to digital utility (T) and the quality of engagement with the market (R), rather than a metropolitan address (L).

The conducted analysis of strategic documents reveals fundamental differences in the development priorities of the studied institutions, as summarized in Table 4. It should be emphasized that the University of Cambridge was included in this analysis not as a direct competitor for the studied units, but as a theoretical aspirational model (proof of concept), demonstrating that a non-metropolitan location does not constitute an insurmountable barrier to achieving global academic success.

**Table 4.**

*Comparative analysis of LTR analytical framework components for non-metropolitan universities and counterpoint institutions*

Dimension	Regional Universities	University of Warsaw	University of Cambridge
<b>Location (L)</b>	Regional Support: Counteracting depopulation, improving the quality of life for residents.	Environment: High-quality work and study environment, well-being, metropolitan impact.	Social Impact: Social equality, sustainable development, social justice, global social impact.
<b>Technology (T)</b>	Efficiency: Infrastructure modernization, e-services, improving remote learning conditions.	Transformation: Hybrid education models, cybersecurity, workplace flexibility.	Innovation: Technology-driven research, global projects, and commercialization of results.
<b>Relations (R)</b>	Operational Necessity: Local government cooperation, labor market alignment, strengthening the city's academic profile.	Leadership: Partnerships for innovation and regional leadership; challenge: limited business integration.	Ecosystem: Ecosystem-wide collaboration, research commercialization, global partnerships with business and foundations.

Source: own study based on the strategic documents of analyzed universities.

Interpreting the data (Table 4) through the lens of the formula Competitive Advantage =  $L \cdot T \cdot R$  (1), the following discussion points can be formulated:

Regional universities build their positioning upon a strong foundation in the L and R dimensions. Their advantage is essentially stabilizing; they are indispensable for the survival of the urban centers in which they operate. The T dimension remains a challenge, currently serving an instrumental function (addressing infrastructural deficits). To progress, it must evolve into a driver of unique quality and organizational agility.

The University of Warsaw possesses significant potential in the L and T dimensions. However, compared to the global analytical counterpoint, the R dimension—specifically regarding commercialization—remains a challenge. For the advantage to become truly multiplicative (synergistic), it is necessary to deepen substantive business cooperation that extends beyond mere formal partnerships.

The University of Cambridge achieves maximum saturation across all three variables. The synergy between T (technology) and R (business ecosystem), situated within a favorable L environment (the high quality of life of a mid-sized city), generates a global competitive advantage.

This confirms that the LTR framework is a robust tool for navigating the 'brittleness' of the modern educational landscape. The synergy of these dimensions allows non-metropolitan centers to transition from defensive-adaptive strategies (aimed at survival) toward a proactive niche-building path by linking a unique location (L) with specialized technology (T) and supra-local relational networks (R).

## 6. Summary

The objective of this article was to identify the sources of competitive advantage for public academic universities located in non-metropolitan cities under conditions of uncertainty conceptualized by the BANI framework. The analysis of four case studies (Piotrków Academy, Kalisz University, Pomeranian University in Słupsk, University of Siedlce) and the non-metropolitan cities in which they operate, supported by a review of strategic documents, confirmed the utility of the author's original LTR (Location, Technology, Relations) conceptual model as an interpretive framework for the development of smaller academic centers.

The primary conclusions of the study can be summarized as follows:

Location (L) as a resource rather than a barrier. The analysis shows that in a BANI world, "peripherality" loses its pejorative connotation. By offering a higher quality of life, safety, and lower living costs, smaller centers may become an attractive alternative to overcrowded metropolises. In this context, location functions as a stabilizing factor that mitigates anxiety and competitive pressure. When combined with appropriately designed resource policies,

this translates into favorable graduate career outcomes and a high quality of study (quality of life/study synergy).

Technology (T) as a strategic equalizer. The organizational agility of the analyzed universities enables the effective adaptation of digital solutions that mitigate geographical distance. Unlike global analytical counterpoints, where technology often serves an "innovation race", in Polish non-metropolitan cities it primarily fulfills an inclusive and integrative function. The digitization of processes becomes a tool for the democratization of knowledge, compensating for infrastructural deficits in the surrounding environment.

Relations (R) as the foundation of institutional existence. The findings indicate that the analyzed universities function as critical "anchor institutions". Their development strategies are inextricably linked with the strategies of the cities in which they operate, reflecting close cooperation among academia, business, and local government. Without deep, multi-dimensional relationships with their environment, these universities lose their reason for existence, as they lack the critical mass required to function as autonomous entities.

In light of the LTR analytical framework, the competitive advantage of non-metropolitan universities does not stem from economies of scale, but from a unique synergy of close relations and technology within a more stable environment, expressed by the formula Competitive Advantage = L·T·R (1). This multiplicative relationship suggests that the absence or failure of any single dimension significantly diminishes the overall strategic potential. Therefore, a high quality of life (L) alone is insufficient without the digital tools (T) to overcome peripherality and the relational networks (R) to anchor the institution within the regional economy. Consequently, attempts to mechanically replicate metropolitan strategies (e.g., those of the University of Warsaw) cannot yield comparable outcomes under non-metropolitan conditions.

While these conclusions highlight the strategic potential of the LTR framework, the study is not without limitations, which should be taken into account when interpreting the findings.

The primary limitation of this study lies in its qualitative nature and its focus on the specificities of the Polish higher education system. Although the multiple case study approach allowed for an in-depth exploration of the LTR analytical framework's mechanisms, it does not permit full generalization of the findings to other cultural or legal contexts.

Furthermore, an analysis based on strategic documents is inherently declarative, reflecting the planning intentions of university and city authorities (intended strategy). In the dynamic conditions of the BANI environment, these may diverge from the actual degree of implementation (realized strategy).

In addition, data on graduate career outcomes (ELA, 2023) were used solely in a descriptive and contextual manner. Future research should therefore focus on quantitative verification (statistical analysis) aimed at testing the strength of the relationship between the synergy of the LTR dimensions and hard indicators of universities' economic and scientific performance. Despite these limitations, the study provides analytically transferable insights into the strategic logic of non-metropolitan universities operating under BANI conditions.

Beyond its analytical contribution, this study offers practical and societal relevance. The LTR framework provides a context-sensitive diagnostic tool and analytical perspective that may inform policymakers and university leaders, suggesting that the development of public universities in non-metropolitan cities should prioritize contextual specialization rather than the mechanical replication of metropolitan development models. At the same time, the findings underscore the role of public universities as anchor institutions that enhance regional resilience by counteracting brain drain and long-term territorial weakening under conditions of uncertainty.

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