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Original scientific paper

COMMUNITY-BASED ECOTOURISM IN THE BALE MOUNTAINS NATIONAL PARK, ETHIOPIA: CHALLENGES, OPPORTUNITIES AND LESSONS LEARNT

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Abstract

This study aims to evaluate the obstacles and possibilities for promoting community-based ecotourism in Bale Mountains National Park (BMNP) Ethiopia and to summarize and present the lessons that European countries can learn from the empirical results. A descriptive research design was used to incorporate both qualitative and quantitative approaches. The participants were chosen with the snowball sampling technique and data was gathered through a questionnaire survey, in-depth interviews, and observations. Our results testify that the local community possesses a variety of ecotourism assets that might be transformed into profitable community-based tourist goods. These would comprise leisure activities, scenic attractions, and other types of entertainment. From a tourist product standpoint, the local cultures are vibrant and highly intriguing, as are the endangered animals and plants, Fincanbera tourism attraction, Bodity Mountain, rivers, and waterfall watching chances. Despite the excellent prospects and favorable environment for CBET development, the Park faces many obstacles to expanding community-based ecotourism, including low levels of local participation and benefit sharing, infrastructural, manpower, and awareness-related difficulties, policy issues, lack of stakeholder engagement, and exploitative resource use, according to this study. The study's relevance for Europe is illustrated by the fact that the demand for developing countries is gradually increasing, and the motivating factors are increasingly focused on the knowledge of the natural environment. On the supply side, the adaptability and role of grassroots, bottom-up community-based projects are highlighted.

Keywords: Local Communities, community-based ecotourism, Bale Mountains National Park, Ethiopia

INTRODUCTION

One of the sectors with the fastest rate of growth in the world today is tourism, which has a significant influence on local economies, societies, and the environment (Marinello et al., 2023). Traveling is a social activity that brings people from all over the world together (UNWTO, 2008, as cited by Sochipem Zimik & Barman, 2023). In order to foster goodwill among people and, consequently, the nation's socioeconomic growth, tourism is essential. The

tourism sector employs a large portion of the workforce directly and indirectly and adds much to the nation's foreign exchange reserves. Supporting a country's handicrafts and fine arts also contributes to the preservation of the natural beauty, the nation's cultural inheritance, and soil tradition, as well as advancing the process of national integration and international fraternity (Thommandru et al., 2023). It is becoming a more significant source of income, employment, and wealth in numerous nations. Prior to now, people have only focused on the economic benefits of tourism while ignoring its ecological and sociocultural repercussions. In the late 1970s and early 1980s, people tried to pay attention to difficulties associated with tourism and ecotourism in general. Protected areas are under increasing pressure from tourism-related activities, and ecotourism is frequently created within or close to these regions. The paradox of ecotourism is that the ecosystem it depends on gets more degraded the more well-known an ecotourism location is (Lawrence et al., 1997). Increased knowledge of the world's environmental challenges is one of the primary driving elements for the dramatic growth of ecotourism. In both rich and developing nations today, ecotourism is a significant economic force (Fennel, 1999).

Nowadays national parks are being developed and operated as representative ecotourism destinations (Dangi et al. 2018) and national parks are one of the preferred destinations of ecotourism activities. National parks not only have outstanding natural environments and historical and cultural value, but they also create the opportunity for community-based ecotourism in developing countries.

The main objective of our study is to explore the potential and characteristics of community-based ecotourism in Bale Mountains National Park, Ethiopia. Our research questions are:

- What are the opportunities and barriers to community-based ecotourism in Bale Mountains National Park?
- How is community-based ecotourism engaged with local society and what characterizes this process?
- What lessons can European National Parks and community-based ecotourism learn from the Ethiopian experience?

Examining the potential and limitations of community-based ecotourism in the BMNP was found to be important since it reveals the gaps and opportunities for ecotourism expansion in the park. In order to support development actors, decision-makers, and policymakers in the creation of protected areas, pilot research has been done in this field. The relevance of the study and the pilot research is increased by the fact, that the Bale Mountains National Park was inscribed on the World Heritage List in September 2023.

THEORETICAL BACKGROUND – COMMUNITY-BASED ECOTOURISM AND THE BALE MOUNTAINS NATIONAL PARK

Community-based ecotourism (CBET) is considered a sustainable form of tourism that improves the quality of life of hosts at the tourist destination (Pookhao, 2014). CBET endeavours to fill the gap in ecotourism by integrating the local community in the development and operational processes. Consequently, CBET seems to be a solution for local people seeking sustainability in a tourism destination. In the past, many people were unaware of the relationship between community-based ecotourism (CBET) and ecotourism, but now a large number of people worldwide are aware of it because CBET offers the community a number of advantages. Communities can support conservation through ecotourism if they perceive some advantage (or aspire to) and if it does not jeopardize or disrupt their primary sources of income (Kiss, 2004).

CBET is concerned with the social facets of society, and through empowering them and enabling them to profit from ecotourism operations, organizes everything for them. Due to the value ecotourism activities offer to the community, whether directly or indirectly, in terms of generating income and opening up job opportunities, developing and poor countries are now paying attention to them (Guerrero-Moreno & Oliveira-Junior, 2024). Additionally, it offers visitors a top-notch cultural and environmental experience while having no negative environmental impact (Fennel, 1999). For ecotourism development to be effective, local planning and implementation are essential Drakopoulou, 2011).

According to Bacsi et al. (2023) tourism in Africa shows faster growth than in most parts of the world, and East Africa including Ethiopia is one of the major tourism destinations in Africa, where natural resources are among the most important tourism appeals. Although local communities play a crucial role in the sustainable management of these areas, they hardly benefit from living in the most attractive nature-based destinations. The tourism industry in Ethiopia has a promising future and has been expanding gradually in recent years (Bayou and Bedane, 2014; Ketema, 2015b). Ecotourism development has a lot of promise in Ethiopia. Ethiopian ecotourism, meanwhile, is still in its infancy. On the other hand, Ethiopia's ecotourism industry is growing in popularity due to the nation's indigenous flora and wildlife, breathtaking topography, and abundant cultural heritage.

Protected areas cover 17% of Ethiopia's land area. There are 10 national parks under the protection of the federal government and 12 more managed by regional authorities. Even though the majority of protected areas are suitable for CBET development, they nonetheless run into a

number of issues with the local people that have historically slowed down the development of the area. This serves as an example of the numerous challenges that tourist development encounters as a result of a disrespect for local community involvement. Since the creation of a Conservation and Protected Area Programme in 1965, Ethiopia has struggled to maintain its incredible biodiversity and natural resources (Jacobs and Schloeder, 2001). While others have declined in size, several Ethiopian National Parks only exist on paper (Jacobs, 1993). A wide variety of natural, cultural, and paleontological resources have been added to Bale Mountains National Park (BMNP), making it ideal for ecotourism that is based on nature and culture. There are numerous potential ecotourism resources in the park and the surrounding area that could be used to create ecotourism-related goods. Bale Mountains National Park is renowned for its exceptional Afro montane biodiversity, breathtaking scenery, abundance of native wildlife, intact cultural artefacts, and presence of several migratory bird species.

However, since its establishment in 1969, the Bale Mountains National Park and the neighbourhood have encountered a number of challenges linked to the preservation of biodiversity and necessities of sustenance, such as unsustainable human activities and inefficient resource management. In Bale Mountains National Park, which has tremendous ecotourism potential but also faces serious ecological degradation and biodiversity concerns, ecotourism is defined by its underdeveloped state. The major barriers to the growth of community-based ecotourism are inadequate infrastructure and a lack of awareness, a lack of stakeholder initiatives, low levels of local participation and benefit sharing, poor park-community ties, settlement unsustainable livelihood, and exploitative resource use patterns (Hafezi et al. 2023).

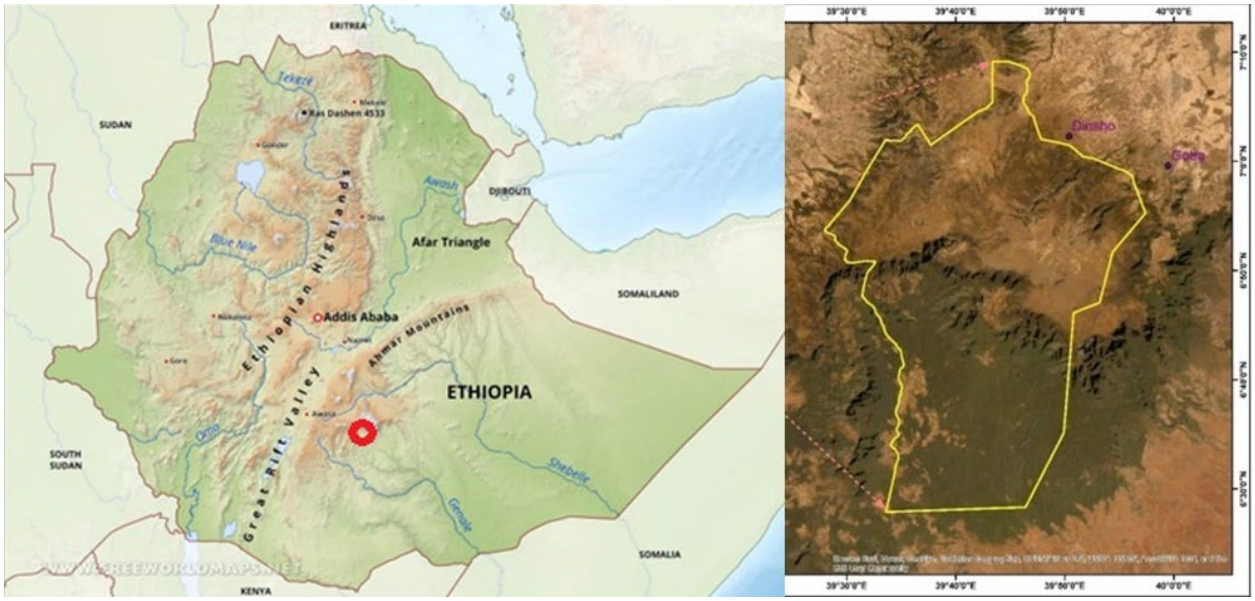
Despite recent improvements in the number of visitors to BMNP, the park's ecotourism sector and rate of visitor flow remain underdeveloped in comparison to its resource base. To make natural resources more beneficial to the local population and the environment, ecotourism should be promoted. Ecotourism combines the preservation of natural areas with improving community livelihoods (Temesgen, 2015; Lemenih et al., 2009). By conducting in-depth research and documentation of potential attractions, creating sound ecotourism plans, supporting successful ecotourism implementation strategies, and generally increasing the participation and responsibility of all stakeholders, ecotourism may be created in some BMNP areas (Ayele, 2011; Aynalem, 2016;).

METHODOLOGY

Introduction of the case study area

The Bale Mountains National Park was designated in 1969 and legally recognized in 2014. The National Park covers some 215,000 ha and falls within Oromia National Regional State, as well as the buffer zone of some 235,121 ha, which includes all the 29 villages adjacent to the Bale Mountains National Park boundary (WHC, 2023). The BMNP is located between 6° 29' and 7° 10' N and 39° 28' and 39° 57' E, roughly 400 km south of Addis Abeba. The Oromia region's Bale and West Arsi zones contain the park. The park is surrounded by five woredas (districts, the third level of the administrative divisions of Ethiopia), including 26 rural kebeles (a minor administrative region in Ethiopia), with Adaba in the west, Dinsho in the north, Goba in the northeast, and Delo Mena and Harena Buluk in the south-east (Figure 1).

Figure 1 Location of the study area



Source: Own elaboration using the basic map of www.freeworldmaps.net

Situated at the heart of the 2,150 km2 Bale Eco-region (BER), the Bale Mountains National Park is one of Ethiopia's biodiversity hotspot places (Gulte et al. 2023). The park is the greatest afro-alpine area in Africa and is situated between 1,500 and 4,377 meters above sea level (Gashaw, 2015). The uncommon, endemic, and endangered species present in the BMNP span all taxa and habitat types, contributing to its global relevance. Additionally, the hydrological system delivers water to up to 20 million downstream users, generating economic advantages (Ethiopian Wildlife Conservation Authority, 2017). The plateau and the mountains that surround it have a chilly climate with lots of rainfall, whereas the lowland area has a tropical

climate that is warm and dry. The BMNP has a varied range of climatic conditions. The long rainy season, which runs from July to October with the highest peak in August, and the short rainy season, which runs from March to June with the highest peak in April, are both present in the eastern portion of the BMNP. Only a brief rainy season, lasting from February to June, occurs in the lowland portion of the BMNP (BMNP ,2017). The research site's lower altitude parts receive 600–1000 mm of mean annual rainfall, whereas the higher altitudinal areas receive 1000–1400 mm (BMNP, 2007). The study area experiences significant daily temperature fluctuations, ranging from -15°C to 24°C.18.4°C is the mean annual maximum temperature, and 1.4°C is the mean annual minimum temperature. Since 1991, the BMNP has seen a significant influx of migrants, primarily due to the change in government (Stephens et al. 2001). Additionally, pull factors related to local politics and the perceived availability of land, as well as push factors related to the limited economic opportunities in the migrants' areas of origin, have contributed to the migration wave (Wakjira et al. 2015).

DATA COLLECTION

The main objective of the study is to identify the barriers to and potential for community-based ecotourism development in the BMNP. Because of this, the descriptive approach was utilised to gather reliable and pertinent information about the subject of the study, and the design is distinguished by the creation of a clear research question in advance. The descriptive approach is used to gather information at a certain period to characterize the nature of present circumstances or to ascertain the connection between particular events. These factors led to the determination that descriptive tactics were more persuasive than qualitative ones.

Both primary and secondary sources provided the information used in this investigation. Among the important sources are the local community, community members, park officials and managers, lodge, government representatives, NGOs engaged in conservation activities, and lecturers. In order to support the analysis, it was also necessary to look into secondary sources, which included books, published and unpublished materials, and annuals. The researchers selected the local woredas and Bale Mountains National Park as a study area. In order to gather the necessary data for this study through interviews, scouts, lodge owners, NGOs, government officials, lecturers, and other stakeholders were specifically chosen. Household samples were acquired by employing networks and the snowball sampling approach. Due to the importance of informal relations in the local economy, the snowball sampling method was the most optimal and efficient sampling method for the research.

According to the directorate of Bale Mountains National Park, a total of 1500 people live in the park, dispersed throughout all five woredas. As the population of the national park live in separate statistical units, official data on the demographic characteristics of the national park population are not available. The researchers selected two woredas Goba and Dinsho for the study sample, where majority of people reside. To determine the sample size for the questionnaire, the researchers adjusted an equation from Yamane (1967).

$$n = \frac{N}{1 + N(e)^2}$$

Where; N = the total population that will be studied
n is the number of people who must be included in the sample.
e = the precision level (which is 10%).
Where Confidence Level is 95% at P = ± 5% (maximum variability)

Accordingly, the total number of sample size for the questionnaire was 75 from two districts (*woredas*). Together with 15 key informants and 75 respondents, the total sample size was 90 persons.

Three various procedures, including the distribution of questionnaires, interviews, and field visits, were used to collect the data. The non-representative pilot study including empirical questionnaire surveys and in-depth interviews has been carried out between March and October 2022. The participants were questioned in an unstructured manner. An interview guide in the form of a list of questions was created. In order to get their opinions on the challenges and prospects for fostering community-based ecotourism in the BMNP, community members, park officials, lodge owners, lecturers, travel agencies, NGOs, and government officials were questioned. A questionnaire survey was used for local households. The questionnaire was designed primarily to gather data on socioeconomic traits, community involvement and participation, perceptions of the park and wildlife, attitudes towards issues of community-based ecotourism and resource use, and the stream of benefits provided by the park. A note-taking camera was also used to capture important information. During park visits, observation served as the main technique of data collection in order to, among other things, monitor the state of biodiversity, visitors, guides, tourism facilities, management of environmental attitudes, and feedback from a variety of local residents' consciousness and lifestyles.

Graphs, percentages, frequencies, and other descriptive statistical techniques were used to analyses the quantitative data from the questionnaire. The sociodemographic make-up of respondents and issues with community-based ecotourism in the Bale Mountains National Park

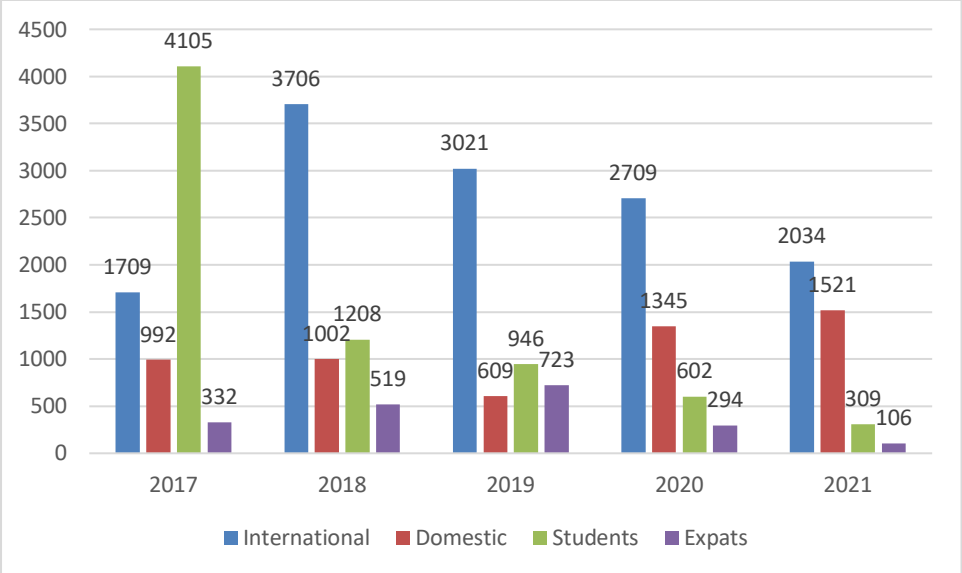
were tested using SPSS 22.0 version software. Narration was used to analyses the qualitative data that was acquired through fieldwork and interviews.

RESULTS

National Park visitation – basic statistics and facilities

In 2017 the park welcomed 1709 foreign visitors and 992 domestic visitors in addition, 332 expats, 4105 students from various Ethiopian universities, 26 researchers, and 2 filmmakers (Figure 2). The number of international tourists peaked in 2018 (3706 visitors) and has been decreasing since then. In 2017, more than 4000 university students visited the park, and the number has been decreasing since then. After a slight increase, the number of expats has been decreasing since 2019. Despite the negative trends, there is some optimism that the number of domestic tourists has been growing dynamically in recent years. This shows that there has been a change in the trend in park visitation and that the importance of the park is increasing in the eyes of domestic tourists. This trend confirms the potential of community-based ecotourism in the country as well.

Figure 2 Number of different visitors in the Bale Mountains National Park



Source: Own elaboration based on data obtained from BMNP (2021)

The COVID-19 epidemic, travel restrictions, and other precautionary measures taken in reaction have resulted in a decrease in the number of visitors to Bale Mountains National Park. Despite the park's wealth of potential tourism resources, they aren't up to industry standards of development. The park doesn't use any specific marketing strategies and isn't well advertised.

The park's instruction manuals, bird booklet, brochure, and website are all excellent places to start, but they still require further attention and updating.

Few hotels in adjacent towns like Robe and Goba cater to tourists, while the park itself only has two lodges (Dinsho and Bale Mountains Lodge). The luxury Bale Mountains resort is situated in the Kach clearing of Harena Forest and offers opulent and luxurious accommodation as well as a welcoming staff. The Dinsho lodge is situated at the headquarters. The Gusa Mountains, as well as the bamboo forest behind the lodge, the nearby plateaus, and the Harena forest, can all be seen from its advantageous location. Only three of the park's approximately 20 satellite campsites have sufficient amenities. The remaining campsites are unfinished and unequipped, which shortens guests' time in the park and decreases their enjoyment. The aforementioned accommodations and facility issues restrict tourist flow, and travellers to Bale have lodging issues, which lowers the park's potential economic worth (Abayneh, 2020).

Socio-economic characteristics and results

According to the data gathered from respondents to the surveys in Table 1, there were 65.3% more male respondents than female respondents (34.7%). However, because the targeted participant was men predominantly engage in ecotourism and other activities at the Bale Mountains National Park, the survey respondents' gender distribution showed that men exceeded women by a significant margin.

Table 1 Respondents distribution based on gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	26	34.7	34.7	34.7
	Male	49	65.3	65.3	100.0
	Total	75	100.0	100.0	

Source: own survey

Between the ages of 26 and 35 made up the bulk of respondents (53.3%), followed by 36 to 45 (25.3%), 18 to 25, and 46 and over (8%). The statistics show that 91.9% of respondents are between the ages of 18 and 46, which is the prime working age. The targeted participants ranged in age from 26 to 46. According to data from respondents to the surveys in Table 2, adults and dependents made up around 8% of the total respondents (46 and above).

Table 2 Respondents distribution based on age groups

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-25	9	12.0	12.2	12.2
	26-35	40	53.3	54.1	66.2
	36-45	19	25.3	25.7	91.9
	46-54	6	8.0	8.1	100.0
	Total	74	98.7	100.0	
Missing	System	1	1.3		
Total		75	100.0		

Source: own survey

Regarding the ethnic composition of respondents, the Oromo ethnic group accounts for 70.7% of the respondents, while the remaining 28% and 1.3% are from the Amhara and Somali ethnic groups, respectively. Most of the Oromo-speaking population in the area are farmers and cattle herders. Afan Oromo is the official tongue of the Oromo people. More than 25 million Oromos speak this Cushitic language as a lingua franca. However, some Bale Mountains residents also speak Amharic (Richman and Admassu, 2013). Among the four communities in and around BMNP, Islam (49%) is the most common religion, followed by Orthodoxy (30%), Protestantism (10%), and Waaqefataa (6%). According to Richman and Admassu (2013), Protestantism (1%), Orthodox Christianity (20%), and Islam (77%) are the three most prevalent religions in the Bale Mountains.

Table 3 shows that many respondents (45.3%) went to elementary school, followed by (25.3%) secondary school, (16%) were illiterate, (6.7%) had no formal education, and (6.7%) had earned a college graduation. This table reveals that the majority of the population went to primary school.

Table 3 Distribution of residents by educational background

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	College	5	6.7	6.7	6.7
	Illiterate	12	16.0	16.0	22.7
	No formal education	5	6.7	6.7	29.3
	Primary	34	45.3	45.3	74.7
	Secondary	19	25.3	25.3	100.0
	Total	75	100.0	100.0	

Source: own survey

Table 4 shows agriculture accounted for the majority of respondents (68%), who were then followed by those who were involved in petty trading (12%), cooking (10.7%), agriculture and park scouting (4%) and students (2.7%), as well as those who were engaged in both agriculture and tourism (1.3%) and ecotourism (1.3%). The results of the study showed that the majority of respondents (68%) worked in agricultural businesses.

Table 4 Distribution of respondents by occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agriculture	51	68.0	68.0	68.0
	Agriculture &Tourism	1	1.3	1.3	69.3
	Both agriculture and park scout	3	4.0	4.0	73.3
	Cooking	8	10.7	10.7	84.0
	Employed in ecotourism	1	1.3	1.3	85.3
	Petty trading	9	12.0	12.0	97.3
	Student	2	2.7	2.7	100.0
	Total	75	100.0	100.0	

Source: own survey

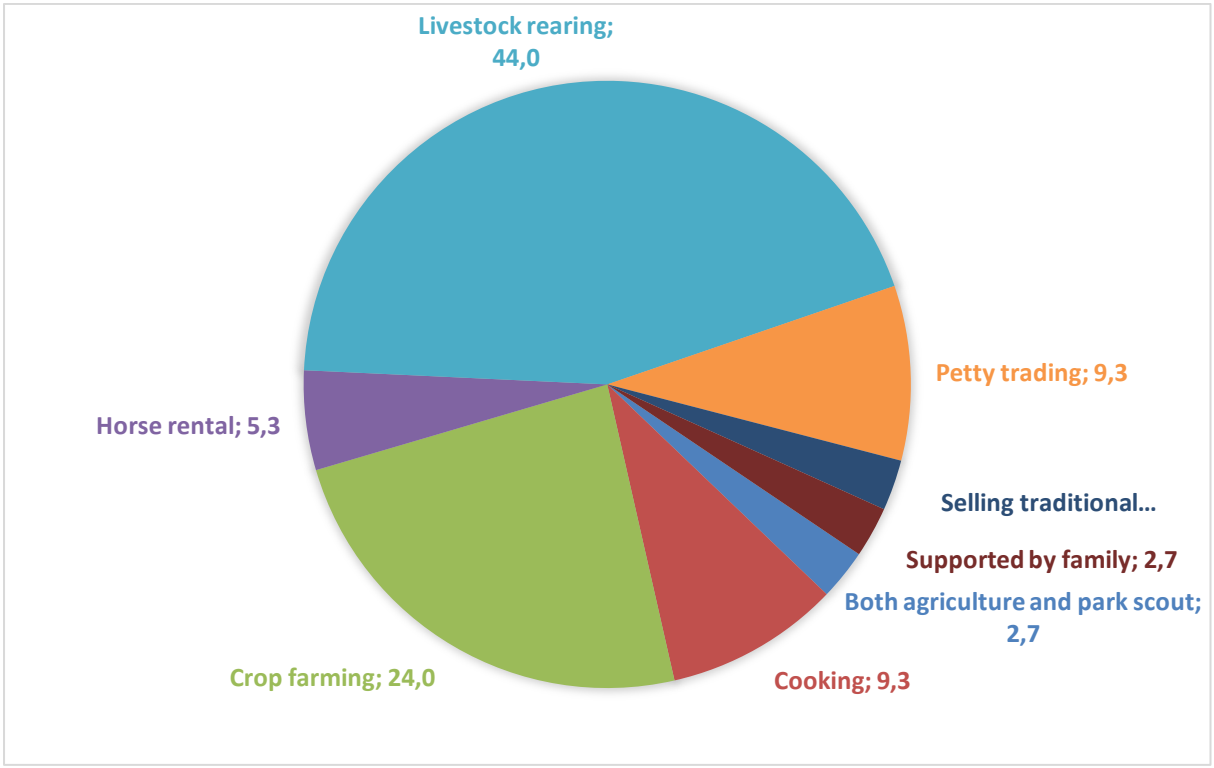
The natural resources of the BMNP area are used by locals in a variety of ways to support their way of life. Figure 3 shows that the park's most valuable resource was its water supply (52%), which was followed by firewood (16%), beekeeping (16%), pasture/grazing (14%), and hunting (1.3%). Although it is forbidden to collect fuel wood in the BMNP, some people (16%) do so to meet their own needs for home energy or to sell. Park scouts chase away people who are attempting to collect dry wood from the park, even though it is difficult to stop them from doing so. According to the results of key informant interviews, another noteworthy factor is that since its establishment, BMNP has helped the local population through ecotourism-related activities including the sale of goods, leisure or relaxation, and environmental preservation. Water, pasture for domestic animals, and other advantages are still provided by the park to the locals.

Figure 3 Distribution of existing natural resources used by local communities (per cent)

Source: own editing, N=90

Figure 4 demonstrates that almost all interviewees agreed that the main economic activities in the study area were raising livestock (44%) and farming crops (24%) as well as cooking (9.3%), small-scale trading (9.3%), renting horses (5.3%), working in both agriculture and parks (2.7%), being supported by family (2.7%), and selling traditional handicrafts (2.7%). The Oromo and Amhara people who lived in and around the BMNP relied primarily on raising cattle and cultivating crops for a living.

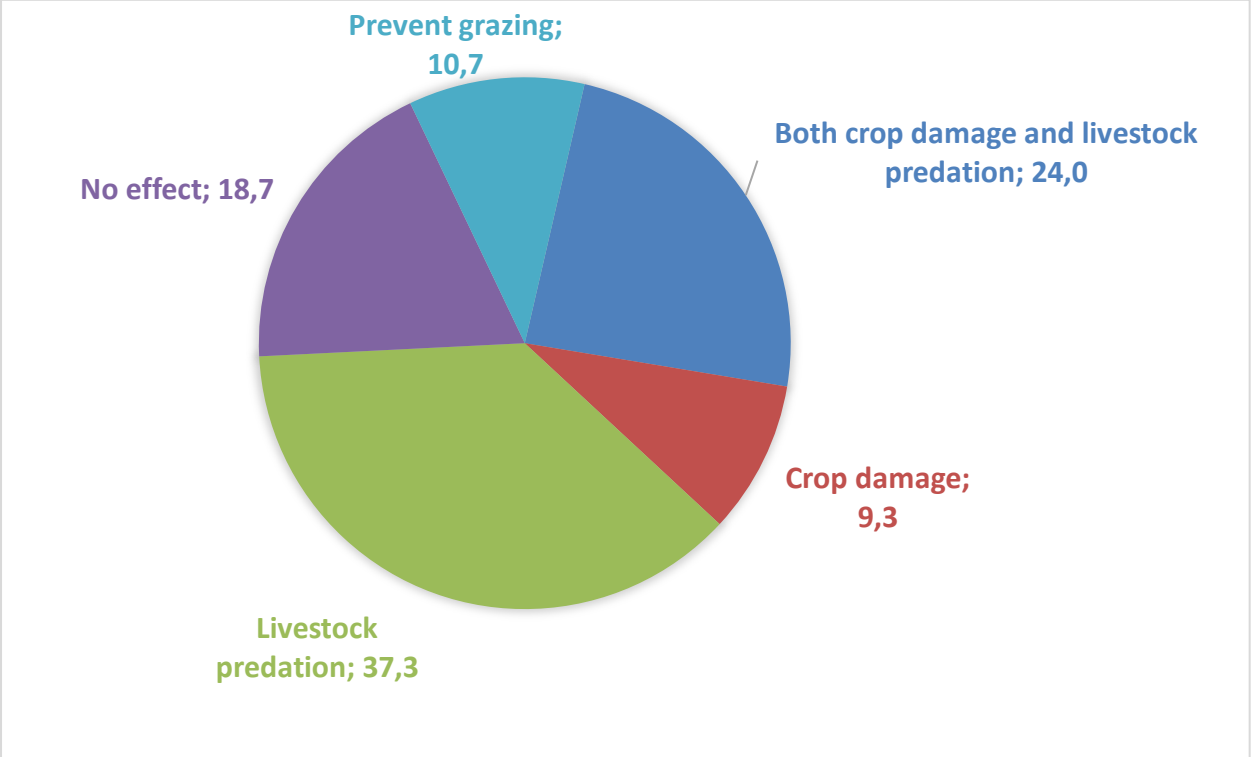
Figure 4 Major source of income for the local communities in the case study area (per cent)



Source: own editing, N=90

Furthermore, as shown in Figure 5, 10.7% of the community complained about park restrictions on grazing their animals during droughts, cutting grass for thatching and as fodder for their livestock, and a high penalty if caught with their cattle grazing in the park. 37.3% further claimed that the park caused their livestock to be preyed upon by Spotted Hyena and Common Jackal. 9.3% of respondents indicated crop destruction, 18.7% indicated no adverse effects, and 24% indicated both crop damage and livestock predation.

Figure 5 Distribution of negative effects of the park to local communities



Source: own editing, N=90

The results of the statistical data and our empirical questionnaire survey can be summarised as follows:

During the period under review, the composition of visitors to the national park changed significantly. In 2017, foreign visitors were still predominant, but in a few years the trend reversed and in 2021 domestic tourists played the dominant role. It is encouraging to see that the national park has gained importance among domestic visitors. However, there is concern that the decline in interest in the national park and the lack of capital-strong foreign tourists could hurt the long-term operation and funding of the park.

The underdevelopment of tourism infrastructure, with higher quality commercial accommodation located in larger settlements or favourable natural geographic locations away from authentic cultural areas, is an obstacle to ecotourism development.

The respondents' composition reflects the composition of the high mountain rural population in sub-Saharan Africa: young men, predominantly Muslim, with low education levels, agricultural occupations, and mostly engaged in pastoral livestock and crop production. Services, selling of local products, and other activities are under-represented, making it difficult to promote and disseminate community-based ecotourism in local communities.

DISCUSSION

Opportunities and Obstacles for Developing Community-Based Ecotourism

Enhancing linkages between agriculture and tourism would be inevitable for stimulating local production, retaining tourism earnings in the locale. Findings of Welteji and Zerihun (2018), however, revealed that there is still no economically profitable coexistence between agriculture and tourism in the Bale Mountains National Park. Promoting and disseminating the practice of community-based ecotourism in the local community could be an important breakthrough in this process. Currently, the tourism plan for Ethiopia does not have any implementation procedures and does not place any emphasis on ecotourism or community-based ecotourism. Instead, it focuses on broad-based developmental frameworks, the creation of both new and existing tourist attractions and products, the expansion of necessary infrastructure and tourist services, ensuring that the country benefits from the sector by maintaining a competitive position in the global tourism market, and addressing the industry's severe capacity issues.

There are numerous ideal settings for starting CBET in the BMNP and the neighborhood. A few of the acceptable requirements for developing community-based ecotourism in the area include the presence of several potential natural and cultural ecotourism resources, the existence of suitable local institutions within the local community, local community interest, and CBET supportive policy. According to the findings of interviews, almost all of the communities have a positive attitude towards the development of community-based ecotourism in the BMNP and surrounding areas despite their low awareness, perception, and knowledge. The Ethiopian governments environmental policy is written in an approachable manner that encourages local community involvement in resource management and environmental protection. If environmental projects endanger the way of life of the local population, it gives them the right to not just complete consultation but also to take part in and have an impact on the decision-making process. Community-based ecotourism development needs strong institutional foundations on the local level, like the Gada system. The local population is more effectively mobilised for CBET development by traditional systems than by woreda and kebele governments. In contrast to the majority of other national parks in Ethiopia, BMNP is rich in natural and cultural resources that can be exploited to develop ecotourism that is focused on both nature and culture. The park and its surroundings contain a wealth of ecotourism resources that could be developed into ecotourism goods. Rivers and waterfalls, Bodity Mountain, local culture, endangered species of flora and animals, Fincanbera, a popular tourist destination, and

the park itself are all potential ecotourism resources that might be turned into ecotourism-related products.

As Bacsi et al. (2023) state, pastoralism, as a traditional lifestyle, can contribute to the cultural heritage and cultural appeal of developing countries. Pastoralism has a significant role in income generation, which is reflected by its share in the national GDP, and in the tourism-related income of Ethiopia. According to the constitution, pastoralists in Ethiopia have the right to unencumbered land for grazing and cultivation as well as the right not to be ejected from their own grounds. Our results show that the state's environmental programmes, which include the creation of national parks for tourism purposes, have most severely impacted pastoral villages. Their lands were essentially regarded as no man's land because they do not have sedentary lives. Thus, the issue of pastoralism in the Bale National Park needs to be reconsidered.

The development of pastoralism could also be a good entry point for community-based ecotourism. According to Pookhao (2014) local participation is essential for the growth of community-based ecotourism, which supports biodiversity protection. Benefits received from CBET operations affect the community’s attachment and involvement towards sustainable tourism development. As Bekele (2008) pointed out, Ethiopia's environmental policy places a strong emphasis on encouraging local population to get involved in the creation and administration of protected areas, both inside and outside of them. In order to promote sustainable environmental development, it also emphasizes the need for communities to acquire the authority to decide for themselves on issues that have an impact on their quality of life and the environment.

The Wildlife Policy of Ethiopia promotes community involvement in managing protected areas and benefit sharing with local communities, however it lacks more detailed procedures that specify how these general ideas should be put into practice on the ground. Although the proclamation emphasizes the value of community involvement at the municipal level, it does not provide any specific rights or avenues for participation. With its emphasis on wildlife management for poverty reduction and private investment, it seems to stress the ecological and financial aspects of conservation in protected areas.

If a protected area is to accomplish its conservation objectives, it must have the support of the neighborhood, and in order to have the support of the neighborhood, people must be involved. Some participants mentioned throughout the interview the value of community involvement in the growth of community-based ecotourism in the BMNP. However, they acknowledged that including locals might provide a substantial challenge. Regarding their

involvement in the park, the respondents were questioned. Majority of respondents (84%) said they were willing to engage in ecotourism activities when asked, while the remaining 10% and 5% said they were already engaged in ecotourism activities and were not willing to engage in such activities, respectively. The 5% who weren't interested in tourism or activities associated with it.

According to our observations and conversations with influential people, there is a significant personnel gap between park employees, the local community, government administrative authorities, and woreda, zonal, and regional tourism offices, notably in the field of community-based ecotourism. The number of ecotourism experts or consultants overseeing ecotourism or community-based ecotourism efforts, for instance, is insufficient among the relevant organizations.

Despite some initiatives by regional tourism organizations in the Oromia region, local youth are serving as local guides for excursions outside the park without the proper training. Due to this gap, locals need increased CBET training to diversify ecotourism products, participate in alternative income-generating activities, and establish community-based tourism businesses.

Community-based ecotourism are relatively recent notions (e.g. Kunjuraman et al., 2022; Annas et al. 2024; Guerrero-Moreno and Oliveira-Junior, 2024). Our results demonstrate that 57.33% of respondents were unaware of community-based ecotourism and ecotourism development projects in the park. Thus, the local population of BMNP are rather ignorant of the ideas of ecotourism and community-based tourism. Unfortunately, most residents aren't familiar with ecotourism or community-based tourism yet.

Relevance of the Results in European Context and Links to European Trends

Demand side

There are two basic processes that influence the evolution of the demand side. First, ecotourism, sustainable and responsible travel becoming an industry standard. Second, there is a fundamental increase in interest in community-based tourism in the European market, with this type of trips appearing in the offer of OTAs (Online Tourist Agencies) and in direct sales. Research conducted by CBI (Centre for the Promotion of Imports from developing countries established by the Netherlands Ministry Foreign Affairs) in 2022 found that, on average, 96.2% of respondents planned to travel abroad and 21.6% planned to travel to developing countries. The European countries that offer the most opportunities for CBT in developing destinations are the UK (24.7%), Spain (23.2), France and Italy (21.7% each), the Netherlands, Germany,

and more recently Sweden (cbi.eu 2024a). Overall, the three main motivations of EU citizens to choose a destination are the 'cultural offerings at the destination' (44%), 'the price of the overall trip' and the 'natural environment in the destination' (both 43%) (Flash Eurobarometer 499). In addition to Western European countries (Germany, France, the Netherlands and Belgium), 'nature' is also the most important motivating factor in some Eastern European countries (Poland, Czech Republic). In these countries, the older age group, between 50 and 70 years, is the main group interested in ecotourism. They have money to spend and time to travel, and they are experienced travellers, well-educated and prepared to spend more for an authentic, immersive experience. This group could be the most important target group for CBET in Ethiopia in the future. To sum up, we can conclude that the issue of CBET in national parks fits well with European trends.

Supply side

Indigenous-led experiences are a growing CBT trend. More and more indigenous communities around the world are entering the CBT market. They are introducing experiences that allow visitors to learn about the origins, history, culture and future of a destination. This is a very positive development for indigenous communities that have been negatively exploited for generations. Today, tourism is an effective tool for preserving their unique culture and educating travellers, and directly benefits different groups. There are many and diverse indigenous communities around the world that can benefit from the demand for authentic, immersive experiences. Indigenous peoples make up about 5% of the world's population, but manage up to 25% of the land. These lands are often located in areas of high biodiversity, protected areas and ecological importance. These communities are therefore well placed to provide the most immersive experiences in remote, less visited places (cbi.hu 2024b).

CBT and CBET activities, which are also environmentally friendly, include a range of opportunities, some of which could be used in Ethiopia: learning about local flora and/or fauna, guided bird watching trips, trips to local wildlife parks or nature reserves, trips to local communities, villages, festivals and events, and food experiences - eating with local families, learning how to prepare a traditional dish, meeting local artisan producers. Taking into account international trends and bookings, Kenya and Uganda are the biggest CBT competitors for Ethiopia.

Communities, companies and SMEs in developing countries that want to sell their products on the European market will have to meet higher sustainability standards to comply with

European criteria (see for example the EU Green Deal, the European Package Travel Directive, the General Data Protection Regulation or the requirements for Liability Insurance and Insolvency Protection). More and more European tour operators will only work with suppliers that are certified or can show a sustainability certificate (cbi.eu 2024c).

Adaptable findings on community-based activities in conservation areas

Basically, there are two types of operation in Europe, one is the top-down managed national park, which can often operate with significant investments, and the other are protected areas where bottom-up operation (individuals and civil society organisations) is more prevalent (Dukic et al 2014). The latter are capable of achieving a certain level of visibility, which is still not sufficient to promote the destination with a greater impact. On the other hand, the existence of such initiatives is important because they represent a real force and capacity that can be important in tourism development, especially in its development based on consultation and cooperation with the community. For a destination to develop in line with this concept, it is necessary to involve (in addition to the relevant documents) all the efforts of individuals and organisations on the ground to complement the stated plan with the grassroots activities without which a successful community-based ecotourism destination cannot be developed. In particular, it is important that revenues stay in the community and that the environment and local traditional values are not damaged (cbi.eu 2024c). These results can be adapted to national parks located in less developed areas (especially in East Central Europe) and where there is significant economic activity in the buffer zone of national parks.

CONCLUSIONS

According to Kiss (2004) development organisations see CBET as a potential opportunity for economic development and poverty reduction. From a conservation perspective, CBET support can contribute to the long-term conservation of protected areas, as the preservation of the natural environment, especially in economically disadvantaged areas, is essential to sustain the income generated from it. Our results support the findings of Salafsky et al (2001) that CBET or tourism alone is insufficient for entry-level business to generate significant income. It can take years to build and manage a similar business. CBET can be successful mainly in the area of land use, but is not efficient enough in terms of pure conservation. It can successfully contribute to local community income generation and community building. In the long term it can reduce the need for an external financing.

The Bale Mountains National Park provides an excellent opportunity for developing community-based ecotourism in Ethiopia. Through conversation and observation, it was found that the local community possesses a variety of ecotourism assets that might be transformed into profitable community-based tourist goods. These would comprise leisure activities, scenic attractions, and other types of entertainment. From a product standpoint, the local cultures are vibrant and highly intriguing, as are the endangered animals and plants, Fincanbera tourism attraction, Bodity Mountain, rivers, and waterfall watching chances.

Despite having great opportunities and a favorable climate for CBET growth, the Park must overcome a number of challenging obstacles. The resource base needed for the construction of an ecotourism park is impacted by low levels of local participation and benefit sharing, poor park-community ties, settlement unsustainable livelihood, and exploitative resource use patterns.

Other significant barriers to the growth of CBET identified in the report include a lack of stakeholder initiatives, commitment, and engagement, particularly on the side of Ethiopian Wildlife Conservation Organization, local government, and other important stakeholders.

Problems with policy, law, and regulation have also been noted as significant obstacles. Ethiopian environmental, animal, and tourism policies, as well as numerous laws, provide the main obstacles to constructing CBET in the Bale Mountains National Park region. Collaboration was also found to be a barrier to the development of community-based ecotourism in the Bale Mountains National Park region, in addition to issues with infrastructure, labor, and awareness. The study's conclusions show that unless local residents are involved in all park activities and are guaranteed long-term benefits through CBET, it will be impossible to preserve the park's few surviving indigenous resources. Because it enables locals to priorities their development goals while also strengthening conservation partnership, ensuring CBET through genuine involvement and participation is a crucial tool for conservation.

In order to successfully develop a responsible community-based ecotourism destination, the characteristics of the destination must be in line with international strategy documents, national development strategies and, of course, local development and planning documents. Furthermore, a coherent action by state and local governments, as well as individuals and groups at the local level, must be brought together at all stages of destination and product development, from resource mapping through to product creation, promotion, marketing and revenue use (cbi.eu 2024c).

The European relevance of our research is demonstrated by the growing trend of community-based tourism and ecotourism from Europe to developing countries in international tourism.

Especially the older age group in Western European countries could play a greater role in the future in the exploitation of community-based ecotourism in Bale Mountains National Park. Our study also presented some adaptable results for the further development of national parks located in disadvantaged European areas.

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Original scientific paper

EAST CENTRAL EUROPEAN REGIONAL CLUB CONVERGENCE IN THE NEW MILLENNIUM

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Abstract

The study analyses economic convergence in the NUTS3 regions of eight East Central European (ECE) countries (Poland, Czechia, Slovakia, Hungary, Slovenia, Croatia, Romania and Bulgaria) that joined the European Union in 2004. In our analysis, we reject the hypothesis of global income convergence for the period 2001–2019, arguing for the presence of geographical convergence clubs with different steady states. We also attempt to describe the factors that influence the formation of these clubs.
In our analysis, we first used the log t-test to classify the 201 regions of ECE into seven convergence clubs with own steady states. The results indicate a 'multi-speed' East Central Europe in terms of income, which shows and predicts strong spatial polarisation and persistence across the region. Our further results suggest that the initial and structural factors impacting club formation are mainly influenced by initial development, changes in the active population, agglomeration characteristics and spatial interactions and, finally, economic structure. The paper demonstrates the validity of the East Central European club convergence hypothesis for the first two decades of the new millennium.

Keywords: convergence, East Central Europe, club convergence, log t-test

INTRODUCTION

The issue of regional convergence and territorial equalisation is one of the European Union's main political and socio-political objectives, which have already been enshrined in the Treaty of Rome (1957), the Single European Act (1987) and the Treaty of the European Union (2012). In the European Union, deepening integration has led to significant convergence, with regional growth accompanied by more favourable inequality trends (Ridao-Cano & Bodewing, 2018). In recent decades, the EU as a 'convergence machine' no longer supports everyone, and it has become clear that convergence within integration is not an automatic phenomenon (Iammarino et al., 2020; Diemer et al., 2022). Development traps seen at various levels of development represent a self-reinforcing process that makes catching-up and progress difficult (Diemer et al., 2022).

In the era of globalisation, regional divergence poses a serious threat to the social, economic and political development of the EU (Iammarino et al., 2017). The topic is particularly exciting for the so-called 'new member states' that joined in 2004 and have faced lots of challenges and new and novel phenomena during the post-socialist transformation (Bourdeau & Lepage, 2007; Capello & Fratesi, 2013; Capello & Pericca, 2013; Smetkowski, 2015; Gorzelak, 2020). The self-reinforcing processes of globalisation, the interdependence of economies, the presence of foreign direct investment, the technological and structural changes in the economy, the deepening of economic integration and the processes of deregulation-liberalisation-privatisation have essentially caused a widening of spatial disparities (Iammarino et al., 2017; Smetkowski, 2018; Ezcurra & Del Villar, 2021).,

The enormous economic growth that the region saw since the EU accession has not yet brought the 'new members' fully up to the average economic development of either the EU27 or the EU15. Regional differences also remained significant. In 2021, 15 out of the 25 lowest performing development regions in terms of GDP per capita were in East Central Europe (Yuzhen tsentralen, Severozapaden, etc.), while 5 out of the 25 regions with the highest GDP/capita were also in East Central Europe (Praha, Bucuresti-Ilfov, etc.). All these performances are realised by the fact that the ECE countries that joined in 2004 received 56.0 per cent of the EU budget's 'Economic, social and territorial cohesion' spending for development in 2014–2020. That is why territorial growth, catching-up and convergence are also important issues for the region.

Within the European Union and East Central Europe, the issue of economic convergence has been the subject of numerous studies (Crespo Cuaresma et al. 2014; Iammarino et al. 2020; Cutrini & Mendez 2024), but its local geographical implications (especially below NUTS2 level) and its evolution still represent a significant research potential.

Basically, the purpose of our study is to highlight the complex geographical and socio-economic transformation of the East Central European region in the new millennium. Our study rejects the phenomenon of global and unique economic convergence for ECE regions (i.e. that all regions reach a unique level of development in the future), aims at detecting geographically differentiated local convergence clubs and explains their multifaceted emergence.

THEORETICAL BACKGROUND

Bourdin (2007) argues that the demonstration of convergence is moving from a global to a local approach. This not only means that subnational contexts are modelled, but also that

geographical proximity and linkages, and regional affiliation, are prominent determinants of growth and inequality (Quah, 1996; Le Gallo, 2004; Le Gallo & Fingleton, 2021).

The most common analytical framework for convergence analysis is the so-called β- and σ-convergence. Absolute (or unconditional) β-convergence is based on Robert Solow's (1956) neoclassical model and assumes that poor countries or regions will eventually catch up with rich ones. According to this theory, regions converge towards a single steady state, the so-called global convergence (Barro & Sala-i-Martin, 2004). However, absolute convergence is not always guaranteed, as besides the initial income level many other factors (conditions) can influence convergence, such as investments, technological progress, institutions, policies, etc. In the case of conditional convergence, the steady state may vary from region to region, depending on the conditions (Mankiw et al., 1992; Rodríguez-Pose & Ketterer, 2020).

The trade-off between absolute and conditional convergence is provided by the club convergence theory, stating that clubs are regions with similar initial and structural conditions that converge to a common steady state (Baumol, 1986; Baumol & Wolff, 1988; Galor, 1996; Friedrich-Eckey & Türck, 2007). In a space with multiple steady states, heterogeneous convergence clubs have been/can be delineated using a variety of complex methods and samples (Durlauf & Johnson, 1995; Quah, 1996; Phillips & Sul, 2007; Friedrich-Eckey & Türck, 2007; Rey, 2019; Karahasan, 2020).

Experiences from the European Union and East Central Europe

Alexiadis (2013) delineated regional convergence clubs in the EU27, pointing to significant geographical differences in convergence. The results of the convergence analysis of the gross value added per worker based on NUTS2 level (1995–2006) clearly illustrate the spatial heterogeneity of growth and initial development in the EU. Calculations based on multiple regressions (with the addition of geography and technology) define the almost contiguous ECE region as a 'diverging' club, which is clearly different from the uniform convergence club of the regions of old EU states.

Spatial interactions (trade, labour flows, knowledge spillovers) are also clearly contributing to the formation of convergence clubs (Rodríguez-Pose & Tselios, 2015). The spatial distribution of clubs is characterised by polarisation, clusterisation and the spatial concentration of poverty traps (Le Gallo, 2001; Annoni et al., 2019; Ayouba & Le Gallo, 2020). Geographical heterogeneity based on spatial autocorrelation of GDP/capita is the basis for the European convergence and club convergence analyses of Le Gallo and Ertur (2003), Fischer and Strirböck (2006), Ayouba and Le Gallo (2020) and Annoni et al. (2019). Based on the results of spatial

autocorrelation analysis, the low own and low neighbouring income regions form a coherent convergence club of NUTS2 regions in East Central Europe, which in some cases is also characterised by club convergence (Fischer & Strirböck, 2006; Annoni et al., 2019).

The new generation of convergence club analysis methodology is an innovative solution by Phillips and Sul (2007, 2009) based on regression analysis and a clustering algorithm that allows the analysis of the temporal and spatial heterogeneity of regions in the direction of convergence or divergence. Using this method, Bartkowska and Riedl (2012) identified 6 income convergence clubs (based on Gross Value Added per worker for the period 1990–2002) for NUTS2 regions in the old Member States. The delineated clubs show a clear geographical distribution in Europe (North-South). The authors use ordinal logistic regression to verify the role of initial conditions (human capital, income level) and structural characteristics as well as spatiality in club formation, as used in conditional convergence analyses. Cutrini (2019) already performed the club convergence analysis (based on GDP per capita) for the EU27 with the addition of the ECE region using the Phillips–Sul methodology. Between 2003 and 2016, the NUTS2 regions of East Central Europe are far from uniform across the EU28, and they are spread across the five emerging clubs. For example, some capital city regions (Mazowieckie, Bucurest-Ilfov, Praha, Bratislavský kraj) were placed in the best performing 'Metropolitan and capital regions' club, while several Hungarian and Bulgarian regions, for example, were placed in the lowest income club 'South-East falling behind'. The authors demonstrate the role of economic structural change, in particular manufacturing and high-productivity service activities, in explaining different income equilibrium paths. Szakálné Kanó and Lengyel (2021) show the income convergence paths of a part of the ECE region (Visegrad Group) using the Phillips–Sul method for the period 2000–2016. With the exception of Warsaw, Wroclaw, Prague and Bratislava (Club 1), none of the NUTS3 regions approach the average income path (GDP per capita) of the EU15 and the results show significant spatial heterogeneity. The authors characterise each convergence club on the basis of sectoral differences in gross value added (agriculture, industry, etc.), urban-rural classification and simple club averages of endogenous factors.

Monfort (2020) describes the income evolution of the EU28 before and after the economic crisis using the Markov chain method. The local results based on NUTS2 regions show that the ECE region becomes much more heterogeneous in the latter period, in particular due to the strong growth of the Western Polish and the Czech and Romanian regions. At the same time, the analyses of the European Commission (2017) and Iammarino et al. (2017) indicate a low level of stagnation and stability in the majority of NUTS2 regions in ECE, with the multidimensional (but essentially GDP/capita) 'development club' regions differing along

demography, labour market and knowledge base. Rodríguez-Pose and Ketterer (2020) explain the growth of the EU 'low income' (convergence) club of regions (actually only ECE regions) by traditional growth factors (accessibility, human capital, agglomeration) between 2000 and 2013. Iammarino et al. (2020) classify EU regions into different types of development traps at different income levels, with the majority of ECE regions belonging to the 'regions trapped at low levels of income' club. Structural and demographic factors influence the trap at low income levels, while institutional quality, high skills and R&D reduce the trap at high income levels.

Smetkowski (2018) describes the development of core (metropolitan) and non-core (non-metropolitan) post-socialist regions ('clubs') between 2002 and 2010 and the factors that influence development. The preliminary region classification appears to be significant in terms of factors affecting development, in particular human capital, migration and small and medium-sized enterprises.

On the one hand, analyses suggest a 'multi-speed' and club-like EU and East-Central Europe, the geographical pattern of the latter having certainly become more sophisticated since the beginning of the post-socialist transition.

On the other hand, the more detailed context of club convergence (especially below NUTS2 level), i.e. the determinants of the conditions (initial and structural factors, geographical proximity) influencing convergence clubs, is not known yet for the wider East Central European region.

Therefore, these two hypotheses are the motivation for our investigations. Since the wider East Central Europe local convergence (club) processes are not well understood, we use the Phillips-Sul (2007, 2009) log t-test and the von Lyncker-Thoennessen merging procedure to delimit NUTS3-level regions in Central and Eastern Europe with similar income trajectories, and create convergence clubs. We hypothesise that the wider ECE region will be characterised by significant income inequalities in the new millennium, and thus the presence of convergence clubs can be detected.

On the other hand, the factors influencing the formation of local convergence clubs are described using ordinal logistic regression (i.e. the club convergence hypothesis is tested), and these processes are not known in detail in the ECE region under study. Both subanalyses can be considered as novel for the region under study, as the phenomenon under study has not been analysed using these methods (in particular the von Lyncker-Thoennessen procedure and ordinal logistic regression). Our second hypothesis is that the emergence of convergence clusters is fundamentally explained by initial, structural and spatial characteristics, in addition to socio-economic and territorial transformations.

DATA AND METHODS

The analysis of income convergence in the East Central European regions is carried out in three steps. First, the Phillips and Sul log t-test method (2007, 2009) and the von Lyncker and Thoennessen (2017) cluster merging algorithm are used to detect convergence clubs, followed by ordinal logistic regression to identify the factors that influence club formation. Since we can assume that spatial proximity also plays a significant role in the formation of income clubs (Bartkowska & Riedl, 2012; Li et al., 2018; Cutrini & Mendez, 2023), we also perform Global Moran's I and Local Moran's I calculations for the indicators affecting convergence.

Log t-test

We use a regression based on the convergence test to examine the behaviour of local incomes in ECE region between 2001 and 2019. The panel variable of income (X_{it}) is as follows: $X_{it} = g_{it} + a_{it}$, where g_{it} is the systematic factor (which includes the permanent common component) and a_{it} is the transitory component. To consider temporal transitional heterogeneity, the equation can be modified as follows: $X_{it} = \left(\frac{g_{it} + a_{it}}{\mu_{it}} \mu_t\right) = b_{it}\mu_t$, where b_{it} is the time varying idiosyncratic element and μt is a single common component.

To test whether different regions converge, the estimation of b_{it} has a key function, which is defined by the following relative transition path:

$$h_{it} = \frac{X_{it}}{N^{-1}\sum_{i=1}^{N} X_{it}} = \frac{b_{it}}{N^{-1}\sum_{i=1}^{N} b_{it}}.$$

The relative transition path expresses relative individual behaviour and reveals the relative deviations of the i-th region from the μ_t common growth path. In the case of convergence, the relative transition paths of h_{it} converge to 1, or the cross-sectional variance of h_{it} converges to zero in the long run.

$$H_t = N^{-1}\sum_{i=1}^{N}(h_{it} - 1)^2 \to 0 \; as \; t \to \infty$$

The cross-sectional variance of h_{it} and H_{it} might decrease even if no overall convergence occurs and only local convergence exists within certain subgroups. For this reason, the PS method proposes to consider the following semi-parametric specification of coefficient b_{it}:

$$b_{it} = b_i + \frac{\sigma_i \xi_{it}}{L(t)t^{\alpha}},$$

where b_i is constant (time invariant), ξ_{it} represents i.i.d. N(0,1) random variables across i, but is weakly dependent over t, $L(t)$ is a slowly varying increasing function (with $L(t) \to \infty \; as \; t \to \infty$) and α is the decay rate, or in this case, the convergence rate. The null hypothesis of convergence

can be written as H_0: $b_i = b$ and $\alpha \geq 0$ versus the alternative H_1: $b_i \neq b$ for all i or $\alpha < 0$. Different transitional paths are possible under H_0, including temporary divergence.

Based on the results, Phillips and Sul (2007, 2009) recommended the log t convergence test, which involves estimating the following ordinary least squares regression with a robust covariance matrix:

$$log\left(\frac{H_1}{H_t}\right) - 2logL(t) = a + \beta logt + u_t, for\ t = [rT], [rT] + 1, \dots, T,$$

where $H_t = N^{-1}\sum_{i=1}^{N}(h_{it} - 1)^2$, H_1/H_t is the cross-sectional variance ratio, β represents the speed of convergence for b_{it}, $-2logL(t)$ (where $L(t) = log(t+1)$) is the role of a penalty function and improves test performance particularly under the alternative, r assumes a positive value in the interval (0, 1) to discard the first block of observation from the estimation and $[rT]$ is the integer part of rT. The PS method proposes using $r = 0.3$ for a low number of samples (T < 50). β equals 2α, where the value of α other than 0 is studied using a robust one-sided t-test for heteroscedasticity and autocorrelation. The null hypothesis of convergence is rejected if $t_b < -1.65$ at 5% significance level. Moreover, the size of parameter β is also relevant as $0 \leq \beta \leq 2$ indicates relative convergence, implying convergence in growth rates, while $\beta \geq 2$ means absolute convergence. If convergence for the entire sample is rejected, the testing procedure is applied to convergence clubs, following the clustering mechanism (Phillips & Sul 2007, 2009).

- Step 1 (*cross-section last observation ordering*): order the regions according to the last panel observation of the period.
- Step 2 (*formation of the core group of k^* regions*): the log t-test is run for the first $k = 2$ regions. If $t_k > -1.65$, both regions form the core group (G_k). Following this, the log t-test is run for G_k plus the next region. In case of $t_k\ (k = 3) > t_k\ (k = 2)$, the region belongs to G_k. This mechanism is conducted as long as $t_k\ (k) > t_k\ (k-1)$ for all $N > k \geq 2$. If $t_k\ (N) > t_k\ (N-1)$, the remaining panel converges. If the condition $t_k > -1.65$ does not hold for the first two units, we drop the first unit and repeat the process. If $t_k > -1.65$ does not hold for any units chosen, the whole panel is divergent.
- Step 3 (*filter the data for new club members*): we add one remaining region at a time to the core primary group with k members (G_k) and run the log t-test again. All districts that have a t_k higher than the critical value c^* are added to the core group. If $t_k > -1.65$ is met for this group of districts, it is the first convergence club. If not, we raise the critical value and repeat the procedure until $t_k > -1.65$.
- Step 4 (*recursion and stopping rule*): we create a second group including all regions we could not filter in step 3 and run the log t-test on this subgroup again. If $t_k > -1.65$, the remaining units form their own convergence club. If $t_k < -1.65$, we repeat steps 1–3 to

find another convergence club for all remaining units. If no further club is found, the remaining regions diverge.

Phillips and Sul (2007) suggest $t_k > -1.65$ for clubs. If this is not the case, the procedure must be repeated by increasing parameter c^* until the condition $t_k > -1.65$ is met. In our analysis we apply the innovative club merging procedure proposed by von Lyncker and Thoennessen (2017). Its steps are described below (Sichera & Pizzuto, 2019).

Take all the P groups detected in the basic clustering mechanism and run the t-test for adjacent groups, obtaining a $(M \times 1)$ vector of convergence test statistics t (where $M = P-1$ and $m = 1,.., M$). Then merge for adjacent groups starting from the first, under the conditions $t(m) > -1.65$ and $t(m) > t(m+1)$. In particular, if both conditions hold, the two clubs determining $t(m)$ are merged and the algorithm starts again from previous step, otherwise it continues for all following pairs. For the last element of vector M (the value of the last two clubs) the only condition required for merging is $t(m = M) > -1.65$.

If the basic clustering procedure produces non-converging (diverging) clubs, the following steps are justified on the basis of the algorithm of von Lyncker and Thoennessen (2017).

Run a log t-test for all diverging regions, if $t_k > -1.65$, all these regions form a convergence club. Then run a log t-test for each diverging regions and each club, creating a matrix of t-statistic values with dimension $(d \times p)$, where each row d represents a divergent region and each column p represents a convergence club. Take the highest t-value greater than a critical parameter $e*$ and add the respective region to the corresponding club, then start again from step 1. von Lyncker and Thoennessen (2017) suggest to use $e* = t = -1.65$. The algorithm stops when no t-value > $e*$ is found in step 3, and as a consequence all remaining regions are considered divergent.

Ordinal logistic regression

However, according to von Lyncker and Thoennessen (2017), the PS method is not sufficient to prove club convergence, thus the two-step procedure of Bartkowska and Riedl (2012) is proposed. It is suggested to perform clustering algorithm as a first step and then to identify the factors leading to the formation of each cluster using the ordinal logistic regression. In this case, the dependent variable is c, which indicates the regions belonging to a given convergence club. The clubs can be ranked according to steady-state income, thus obtaining an ordinal-level outcome variable. Based on the club convergence hypothesis, we assume that initial and structural conditions matter in the evolution of steady-state income (Galor, 1996; Bartkowska & Riedl, 2012), i.e. in the formation of convergence clubs. Therefore, the regression equation is as follows:

$$y_i^* = X_i\beta_i + \varepsilon_i,$$

where club membership is related to a latent variable y_i^*, which represents the steady-state income of individual regions, X_i means the initial explanatory factors, ε is the residual with logistic distribution, while i (*1…201*) refers to the number of regions. The estimation of y_i^* and β_i is based on the maximum likelihood technique. In order to assess the importance of each explanatory variable in determining club membership, we calculate the (marginal) effects of the estimated probabilities. The marginal effects estimate how a unit change in an explanatory variable changes the probability that an average region belongs to a given club, while holding all other variables at the sample average.

Spatial patterns of regional convergence

For testing the neighbourhood effect and spatial dependence, we use a global autocorrelation test to reveal average patterns in the income performance of the regions under study. We capture this correlation using the Global Moran's I (Moran, 1948):

$$I = \frac{n}{S_0} \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} w_{ij}(y_i - \bar{y})(y_j - \bar{y})}{\sum_{i=1}^{n}(y_i - \bar{y})^2}$$

where n means the number of regions, $\bar{y}$ is the arithmetic mean of the indicator under study and $S_0 = \sum_{i=1}^{n}\sum_{j=1}^{n} w_{ij}$. The value of w_{ij} is 1 if i and j are neighbouring regions, otherwise the value is 0. The expected value of Moran's I is *–1/(N–1)*. I values above *–1/(N–1)* indicate positive spatial autocorrelation, in which similar values, whether high or low, show spatial clusters. I values below *–1/(N–1)* indicate negative spatial autocorrelation, in which neighbouring values are different. To describe the spatial patterns, we used a local test function of spatial autocorrelation i.e. the Local Moran's I statistic suggested by Anselin (1995). The Local Moran statistic can be used to detect regions that are similar to or different from their neighbours. The Local Moran's I formula is as follows:

$$I_i = z_i \sum_j w_{ij}\, z_j$$

where z_i, t and z_j, t, are the standardised values of the observation units at time t. For the univariate Local Moran, z_i, t and z_j, t refer to the same database. w_{ij} is the spatial weight matrix (Anselin, 1995). The Moran scatter plot generated by the test classifies the regions into four categories according to their location in the four quadrants of the plot: (1) High-high (HH): high value locations where the neighbourhood also has a high value. (2) High-low (HL): high value locations where the neighbourhood has a low value. (3) Low-low (LL): low value locations where the neighbourhood also has a low value. (4) Low-high (LH): low value locations where the neighbourhood has a high value.

Data

The data sources are the OECD[1] Regional Database, the ESPON[2] Database, and the Eurostat Regional Database. The basic indicator of income inequality is Gross Value Added (GVA) per capita. The income indicator is expressed in US dollars and calculated at constant prices and purchasing power parity, with 2015 taken as the base year.

In our analyses, the wider East Central European (ECE) region consists of Bulgaria, Czechia, Croatia, Hungary, Poland, Romania, Slovenia and Slovakia. The NUTS3 region is the basic territorial unit of analysis. In order to approximate the functional regional organisation, we have created so-called 'metropolitan' regions (Eurostat, n.d./a, Smetkowski, 2018), i.e. we have merged urban and agglomeration NUTS3 regions. The merging affected the following cities and regions (agglomerations are shown in brackets): Bucharest (Ilfov), Budapest (Pest), Gdansk (Trojmiejski), Katowice (Bytomski, Gliwicki, Sosnowiecki, Tyski), Krakow (Krakowski), Lódz (Lódzki), Poznan (Poznanski), Warszawa (Warszawski wschodni, Warszawski zachodni), Prague (Stredoceský kraj), Sofia (Sofia, Pernik) and Zagreb (Krapinsko-zagorska zupanija, Zagrebacka zupanija).

The panel database contains income data for 201 regions from 2001 to 2019 (T=19), with a total of 3,819 observations analysed. The main characteristics of the income panel database are presented in Table 1.

Table 1 Main features of the income database (2001–2019)

	obs.	**nr of regions**	**mean (2001, USD)**	**mean (2019, USD)**	**SD2001 (USD)**	**SD2019 (USD)**
Bulgaria	494	26	7,629	12,957	1,854	5,394
Czechia	247	13	19,588	29,725	4,113	7,740
Croatia	361	19	13,359	18,779	3,391	4,933
Hungary	361	19	13,759	21,221	3,936	6,572
Poland	1,197	63	12,323	24,108	3,690	8,519
Romania	779	41	9,253	19,487	2,779	7,497
Slovenia	228	12	19,508	27,676	4,115	6,846
Slovakia	152	8	15,650	30,284	7,904	16,156
ECE8	3,819	201	12,355	21,768	4,982	9,035

Note: obs. is observation (number of regions x T), mean is the average GVA per capita, SD is the standard deviation.
Source: authors' calculations

[1] The Organization for Economic Cooperation and Development.
[2] European Observation Network for Territorial Development and Cohesion.

Based on the literature (Mankiw et al., 1992; Bartkowski & Riedl, 2012; von Lyncker & Thoennessen, 2017), we attribute the emergence of regional convergence clubs to the following initial and structural factors used in conditional convergence analyses (explanatory factors refer to the year 2001, Appendix 1.). The initial period conditions are GVA per capita, employment rate and growth of the active population (15–64 years old). Gross fixed capital formation data, which appear in regional conditional convergence analyses, are only available at NUTS2 level (Bartkowski & Riedl, 2012; Cutrini, 2019), so this indicator is omitted and therefore our models are limited. The regional knowledge dimension is expressed as the value of high-tech patents per million capita due to the limited availability of education data. This indicator also reflects the modernisation of regional economies and can therefore be understood as a structural characteristic.

Structural characteristics basically describe the structural economic features of regions (Bartkowska & Riedl, 2012; Cutrini & Mendez, 2023). The explanatory structural variables for the ordinal regression are the shares of manufacturing, market services, and public services and other services (out of total gross value added), based on the East Central European and EU transformation experiences (Smetkowski, 2018; Gorzelak, 2020; Szakálné Kanó & Lengyel, 2021, Capello & Cerisola, 2023). Since the determinants of regional development and convergence are not only linked to the characteristics of a given region, we included a country dummy variable (Visegrad countries) to address heterogeneity as a geographical and institutional (and integration development) control in our analysis, following Bartkowska and Riedl (2012) and Pintera (2024). On the other hand, to express agglomeration trends and spatial interactions based on the new economic geography theory (Krugman, 1991; Crespo Cuaresma et al., 2014; von Lyncker & Thoennessen, 2017, Cutrini, 2019), we used as explanatory factors the dummy variables ‘predominantly urban areas’ and ‘remote’, which expresses transport geography accessibility.

Convergence clubs were defined using the R programme ‘ConvergenceClubs’ package (Sichera & Pizzuto, 2019), ordinal logistic regression was carried out using Stata 16, and local autocorrelation analyses were performed using GeoDa and ArcGIS.

RESULTS

Having run the log t-test on the gross value added per capita data for the East Central European regions, the hypothesis of overall convergence can be clearly rejected at 5% significance level. The beta is significantly different from 0 and the t-value is –63.381 (standard error: 0.013, beta:

-0.847). In other words, the 201 ECE regions do not converge to a single common steady state, inferring the presence of geographical convergence clubs.

Based on the Phillips and Sul algorithm, the 201 regions are primarily classified into eight clubs, with a t-value greater than –1.65 for all clubs. Based on the von Lyncker and Thoennessen clustering algorithm (2017), the fourth and fifth clubs are merged, with the resulting new club showing a t-value greater than –1.65. Overall, the seven clusters are in a steady state (i.e. multiple equilibrium for the ECE region) with clearly different growth paths in the space under study. There are also non-converging, i.e. diverging, regional clubs in ECE (Tab.2). There are 5, 15, 58, 52, 34, 25 and 9 regions in the first, second, third, fourth, fifth, sixth and seventh club, respectively. Overall, the final results show a 'multi – seven – speed' East Central European region with clear differentiation as to start and end dates (last two columns of Tab. 2). As far as income is concerned, the panel data highlight one outstanding, one high, one average and four low/lagging spatial clubs. Differences between regions in GVA per capita are clearly visible. Simple income averages indicate the problems of income inequality in the ECE region, with constant and widening centre-periphery relations. The most prosperous regions in terms of income have grown by a factor of 2.2 compared to the initial 2001 level, while the least prosperous regions have grown below the regional average and are relatively lagging behind.

Table 2 Log t-test results in East Central Europe (2001–2019)

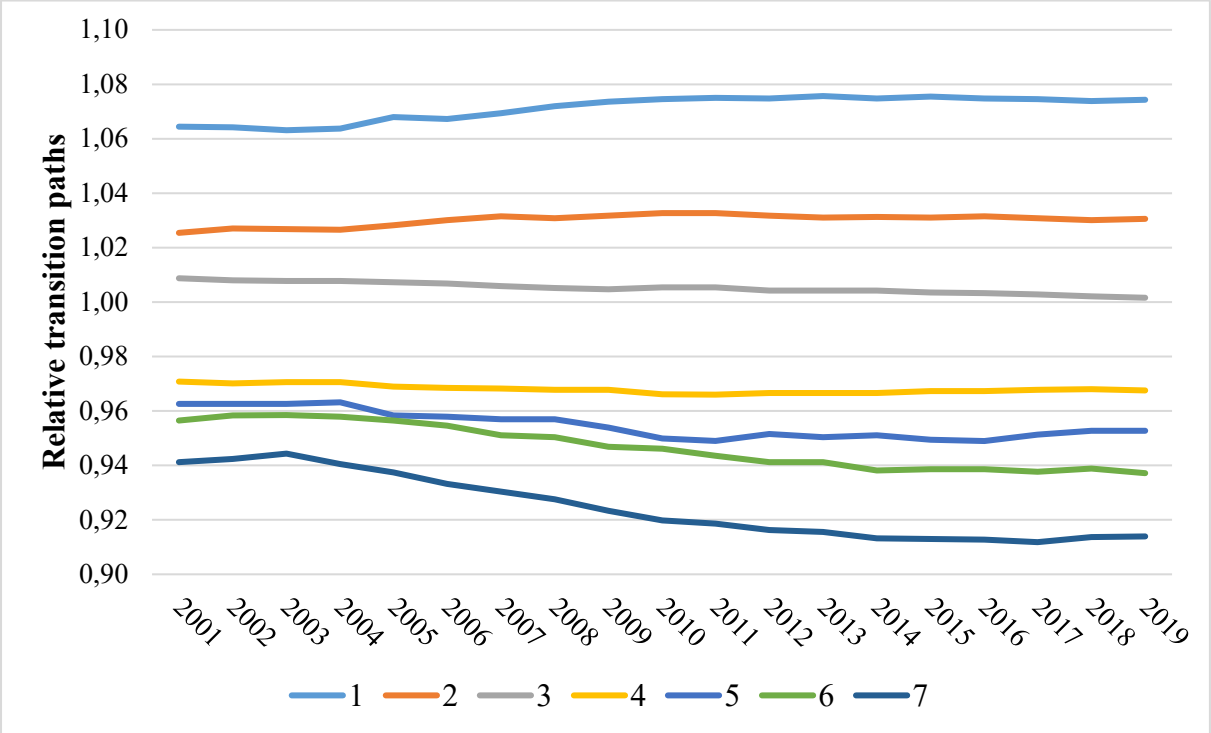
clubs	number of units	beta (std. error)	t-value	$\hat{\alpha}$	GVA per capita	
					2001	2019
Club1	5	0.088 (0.082)	1.077	0.044	185.05	213.74
Club2	15	0.110 (0.072)	1.524	0.055	127.52	136.54
Club3	58	0.125 (0.062)	2.016	0.063	108.73	101.64
Club4	52	0.081 (0.065)	1.252	0.040	75.65	71.83
Club5	34	0.073 (0.061)	1.196	0.037	69.88	61.65
Club6	25	0.104 (0.049)	2.138	0.050	65.97	52.64
Club7	9	0.229 (0.051)	4.473	0.115	56.95	41.53

Note: α – speed of convergence, Gross Value Added (GVA) per capita is based on ECE average. (Constant prices, constant PPP base year 2015.)
Source: authors' calculations

The majority of the beta values are between 0 and 2, so the results do not show absolute convergence within clubs; only relative (conditional) convergence explains the convergence within clubs and the differences between clubs in 2001–2019. Thus, convergence within each club is determined not only by the initial income position but also by other structural and geographical conditions of the economy (Cutrini, 2019; Cutrini & Mendez, 2023). The speed of convergence is fastest for Club3 and Club7 (6.3 and 11.5 per cent, respectively), while the others show lower values.

Figure 1 shows the relative income transitions of the seven convergence clubs over the period under review, as a percentage of the ECE average. All seven clubs show a clearly distinct performance path over the whole period. It can be concluded that already the initial income levels differ significantly and seem to strongly influence the paths of GVA per capita from 2001 to 2019.

Figure 1 Relative transition paths of the East Central European convergence clubs between 2001 and 2019 (average for the ECE region under study, GVA per capita)



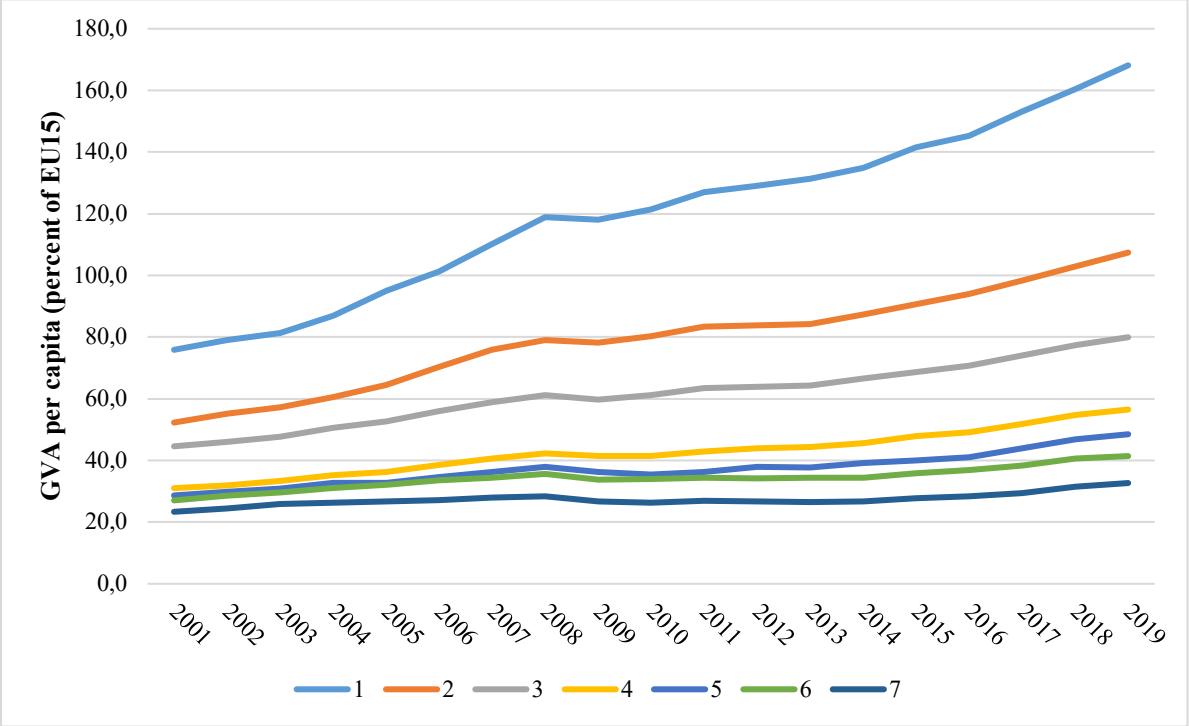
Source: authors' elaboration

There are visible relative changes in the trajectories, especially from the period 2007–2009 (the beginning of the economic crisis), with high-income (above average) regions becoming even richer, while low-income regions below average became even poorer and fell behind over the period under review. It is also observed that the relative decline in the least developed regions (especially Club 7) is larger than the increase in the higher income groups. The average relative

transitions show that the GVA per capita of each convergence club is not converging, that the differences between clubs are stable over the period under review and that persistent inequalities are typical in the period after the economic crisis of 2007–2008.

Comparing the average income paths of the convergence clubs with the EU15 average, Club 1 reached it in 2007 (2019: 168.1 per cent) and Club 2 reached it in 2018 (2019: 107.4 per cent), while Club 3 has shown a very weak and slow convergence towards the benchmark over the period (2019: 80.0 per cent). The three clubs cover almost 60 per cent of the ECE population (only 7.3 per cent for Club 1 and 15.4 per cent for Club 2). The other convergence clubs show a distant growth and position, with no significant convergence (Fig. 2).

Figure 2 Economic performance of each convergence club as a percentage of the EU15 (2001–2019)



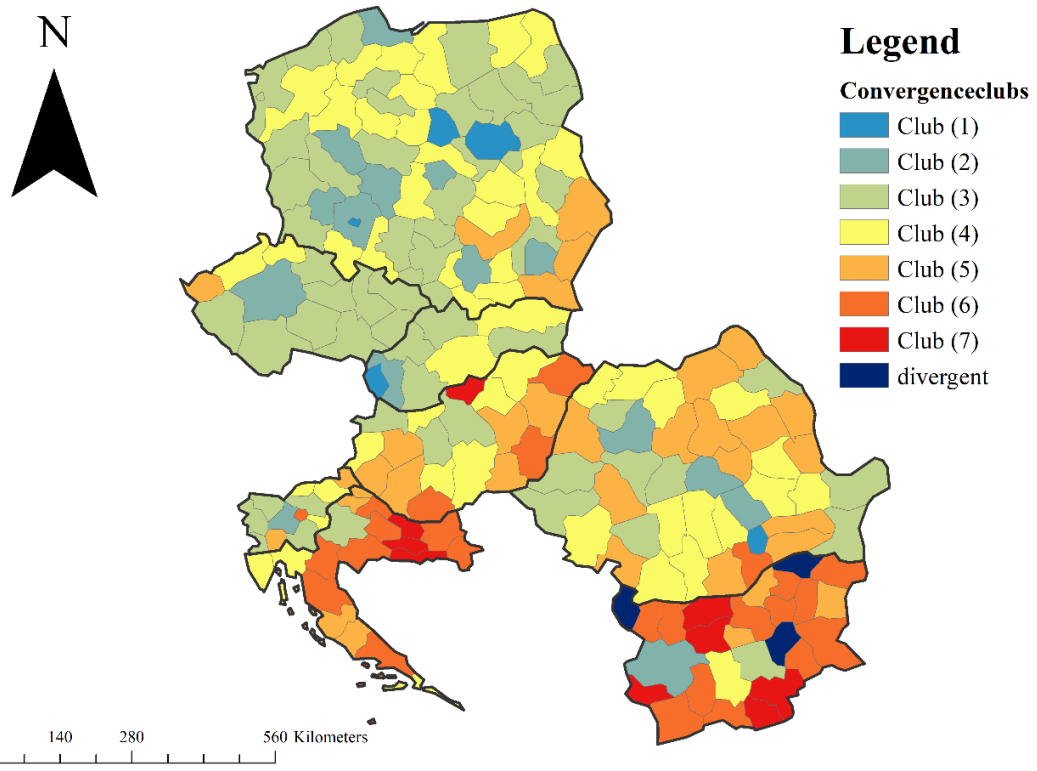
Source: authors' elaboration

Club 1, with its steadily increasing advantage in terms of income, includes only metropolitan areas, with three capital regions (Warsaw, Bucharest, Bratislava) and the Polish cities of Wroclaw and Plock (Fig. 3). Club 2 also includes urban and metropolitan areas, where high-equilibrium income paths are also observed. In addition to Prague, Sofia, Ljubljana, Gdansk, Krakow, Lodz, Poznan, some Romanian (e.g. Cluj, Brasov), Polish (Rzeszowski, Wroclawski) and Slovak (the metropolitan agglomeration of Trnava) regions are also included in this club. Polish regions account for more than half of the group. Club 3 also includes metropolitan areas (Budapest, Zagreb and Katowice) and regions with major cities (e.g. Constanta, Timis, South

Moravia, Szczecin, Győr-Moson-Sopron, Kosice). The Polish, Czech and Slovak regions are overrepresented in the group of middle income path. Particularly striking is the spatial distribution in Czechia (70 per cent of the country is covered by this classification) and Western Slovakia. The results of the log t-test clustering so far clearly point to the role of size dependency and the multi-speed existence of metropolitan areas in East Central Europe.

After Club 3, Club 4 is the group with the second largest number of regions (nearly 26%), where country affiliation can also be an important club-shaping factor. Geographically concentrated, below-average regions appear in particular in Northern and Eastern Poland (mainly in the case of regions between metropolitan areas) and in the Carpathian regions of Romania, but are also scattered in the eastern part of Slovakia and Slovenia, as well as in Hungary, Croatia and Bulgaria. In Czechia and Slovenia, the peripheral areas are more affected by this classification, while in Bulgaria and Croatia the second tier cities (Plovdiv, Rijeka) are included in Club 4. The main characteristic of the fifth lagging club is the absence of external (EU) and internal borders and the geographical location close to the borders, which is evident in all the countries surveyed except Slovakia. In addition to the external peripheries, internal peripherality is also evident (e.g. in Hungary, Romania and Poland).

Figure 3 Convergence clubs in East Central Europe based on gross value added per capita (2001–2019)

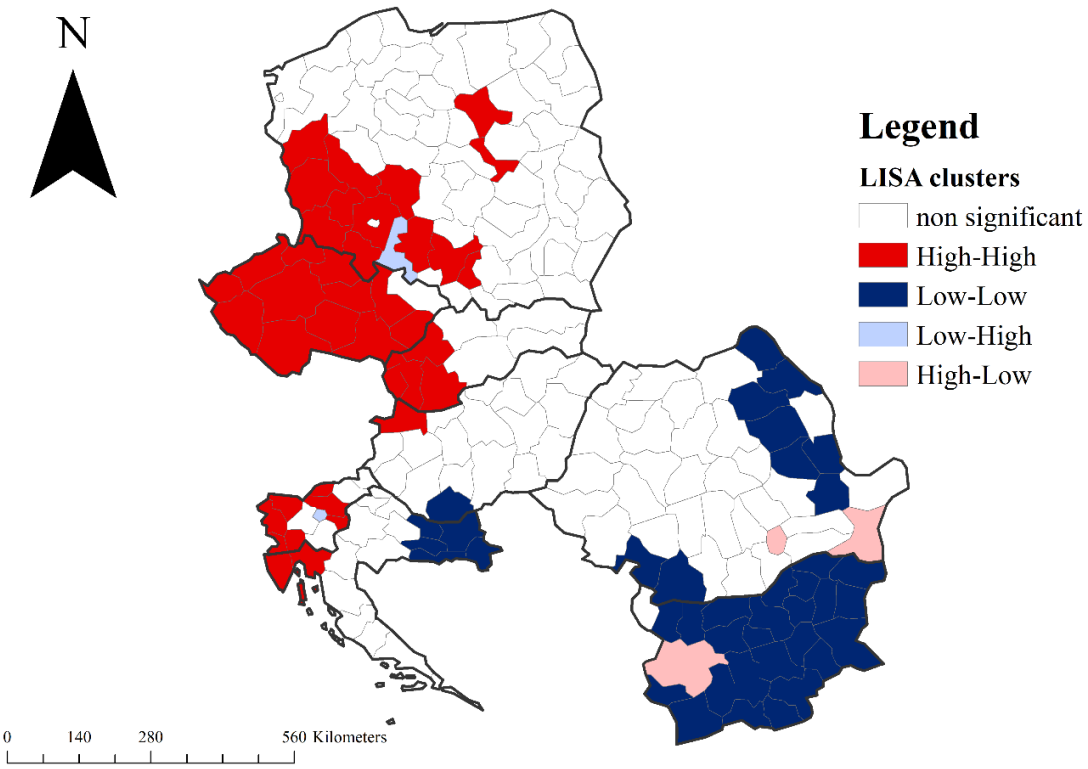


Source: authors' elaboration

The deprived income peripheries of Club 6 present a spatially coherent and spectacular picture. They cover particularly extensive areas in Bulgaria and Croatia, while some of the regions concerned are also found in Hungary, Slovenia and Romania. Closeness to borders and spatial proximity are important club-shaping factors for Club 6. Club 7 covers the smallest number of peripheral regions (9 regions), with Bulgarian and Croatian regions constituting the majority. The geographical distribution of the club is characterised by the same features as in the previous club. Particularly striking is the significant difference between Sofia and its immediate neighbours Lovech and Kyustendil, or Nógrád, near the Budapest metropolitan area, which indicates the lack of spatial spillovers. The divergent regions (not close to the other clubs) are found in Bulgaria, with low-income Vidin, Silistra and Sliven forming this group.

As neighbourhood effects are assumed to play a role in the formation of ECE convergence clubs, the spatial analysis was complemented with the Local Moran's I analysis in order to highlight the relationship between neighbourhood effects and income inequality. The Global Moran's I value for GVA per capita is 0.431 (z-score: 9.405), which is highly significant ($p<0.05$). This means that a characteristic spatial clustering of incomes is observed in the ECE region under study. (Fig. 4)

Figure 4 Local autocorrelation pattern of GVA per capita (Local Moran's I, 2019)

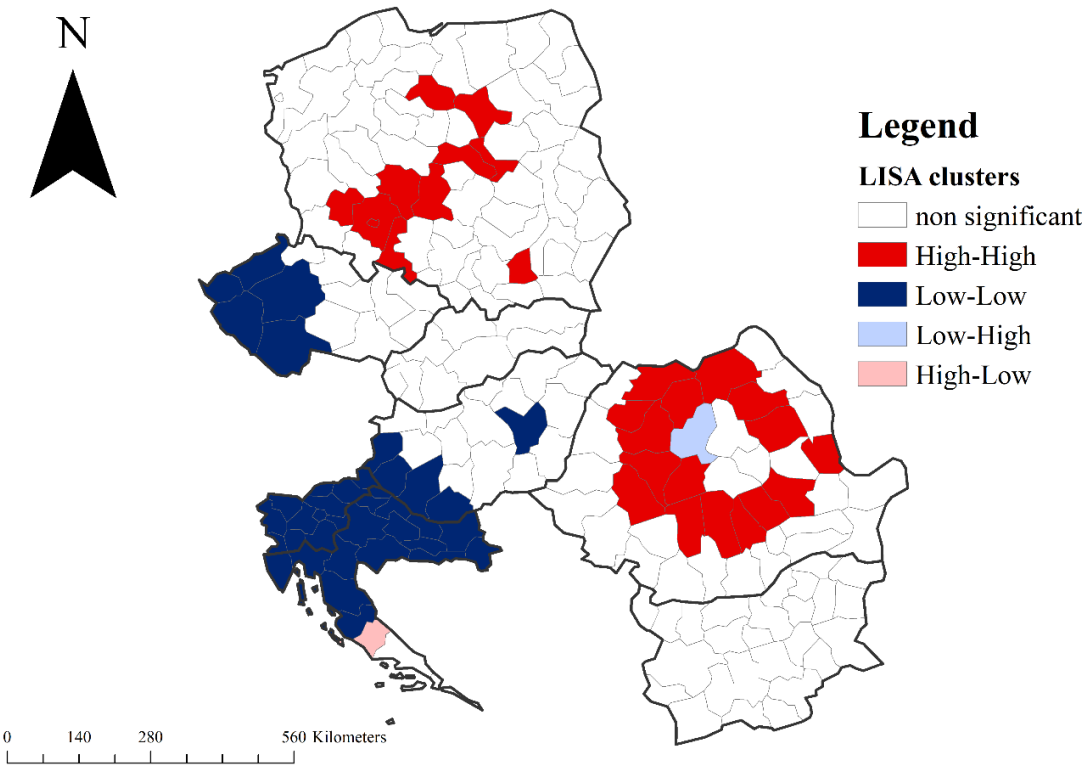


Source: authors' elaboration

The local clusters confirm the cluster results of the log t-test, but due to the specificity of the method, it basically only describes the centre-periphery relations. Neighbourhood effects show on the one hand the east-west relations, for example the coherent core area of Club 3 is clearly visible (Poland, Czechia, Slovakia, western parts of Slovenia), and on the other hand the relative backwardness of the eastern Romanian, eastern Croatian and Bulgarian regions. In addition to the country effects (Czechia, Bulgaria), there are several cases where geographical proximity effects are beneficial (in the regions between Warsaw and Plock, Osrednjeslovenska [Ljubljana], Bratislava, Prague, Katowice, Wroclaw, Poznan, along the cities and urban regions of Poznan), but there is also a lack of spillover effects, for example in Sofia, Bucharest and Constanta.

The spatial autocorrelation pattern of economic growth between 2001 and 2019 (Global Moran's I = 0.567, z-score: 6.121) partly indicates similar generalities: spatial imprints of metropolitan and country effects (Fig. 5). The spillover of growth mainly in Poland indicates the impact of metropolitanisation and the coherent growth zone of western Romanian (mainly Transylvanian) regions.

Figure 5 Local autocorrelation pattern of economic growth (Local Moran's I, 2001–2019)



Source: authors' elaboration

The country effects appear along the low growth path, with Croatia and Slovenia being almost entirely in low-low income (LL) areas. In addition, regions in south-western Hungary and western Bohemia appear in the LL group. The cross-section of static and dynamic characteristics indicates the spatial correlation of neighbourhood effects, which is partly expected and partly nuanced: western Bohemia and Slovenia are characterised with the low growth dynamics of advanced western regions, while low income/high dynamics are mainly present in eastern Romania (the two 'traditional' convergence directions), low income/low dynamics are present in eastern Croatia and south-western Hungary, and high income/high dynamics are present along the large urban regions of Poland.

Club formation in East Central Europe

The results so far indicate significant differences between income clubs, but the club convergence hypothesis is not proven. This requires a proper description of the club-forming effects of initial and structural factors. This was done by running ordinal logistic regression based on the solution of Bartkowska and Riedl (2012).

The model in Table 3 is diagnostically appropriate, showing a good fit (pseudo R-square = 0.677), and most of the explanatory phenomena indicate significant effects in all categories. The table points to the probability of belonging to a particular club for each variable (marginal effects on probabilities), with all other variables considered constant.

As to most of the indicators included in the ordinal logistic regression (initial GVA per capita, employment rate, active population growth, market services, urban areas, remote areas), a unit increase in a given variable contributes to the chances of belonging to higher income clubs (1, 2 and 3), while decreasing the chances of belonging to lower income clubs (4–7).

The ordinal logit regression results show that initial income level has the strongest effect among the initial conditions, with a unit improvement of 148.6 percent increasing the probability of belonging to Club 3, for example, and 93.6 percent decreasing the probability of belonging to Club 5. Initial income level is a strong determinant of club formation across all clubs. Employment rate is a similar, but less strong and less significant, determinant of club membership (significant only for Clubs 3–6, with $p<0.10$). The signs of high tech patent activity are opposite to the ones of initial GVA and employment, but appear to be insignificant factors in the formation of ECE convergence clubs. The growth of the active population is correlated with the income development of convergence clubs, with significant increases in Clubs 1–3 and significant decreases in Clubs 4–7.

Table 3 Marginal effects on probabilities (ordered logit regression)

	convergence clubs						
variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**
initial conditions							
initial GVA per cap	0.007* (0.004)	0.121*** (0.046)	1.486*** (0.306)	–1.512*** (0.236)	–0.936*** (0.215)	–0.309*** (0.091)	–0.038** (0.018)
employment rate	0.000 (0.000)	0.000* (0.000)	0.006** (0.003)	–0.010** (0.005)	–0.004** (0.002)	–0.001* (0.001)	–0.000. (0.000)
patent activity	–0.000 (0.000)	–0.001 (0.001)	–0.010 (0.008)	0.007 (0.002)	0.006 (0.005)	0.002 (0.002)	0.000 (0.000)
population growth	0.001 (0.000)	0.009*** (0.004)	0.112*** (0.024)	–0.092** (0.047)	–0.070*** (0.018)	–0.023*** (0.007)	–0.003** (0.001)
structural characteristics							
manufacturing	–0.000 (0.000)	–0.000 (0.000)	–0.004 (0.005)	0.003 (0.001)	0.002 (0.003)	0.001 (0.001)	0.000 (0.000)
market services	0.000 (0.000)	0.001* (0.001)	0.014** (0.006)	–0.010** (0.005)	–0.009** (0.004)	–0.003** (0.001)	–0.000* (0.000)
public and other services	–0.000 (0.000)	–0.004*** (0.002)	–0.049*** (0.011)	0.037*** (0.010)	0.031*** (0.008)	0.010*** (0.003)	0.001** (0.001)
geographic controls							
urban areas	0.004 (0.004)	0.061 (0.052)	0.343*** (0.116)	–0.221* (0.125)	–0.143*** (0.041)	–0.040*** (0.014)	–0.005* (0.002)
remote areas	–0.000 (0.00)	–0.008* (0.005)	–0.110* (0.060)	0.086* (0.002)	0.080* (0.050)	0.029 (0.021)	0.004 (0.003)
threshold values	–94.386	–91.493	–88.252	–86.167	–84.470	–82.181	–
number of regions	5	15	58	52	34	25	9

Note: *** p < 0.01, ** p < 0.05, * p < 0.10. Pseudo R-Square (Nagelkerke) is 0.677. The parallel regression assumption is not violated. V4 dummy (CZ, HU, PL and SK) is included and significant (not reported). Standard errors are reported in parentheses.
Source: authors' calculations

Structural characteristics confirm the same correlations. The results show that the share of market services in the economy has a positive significant effect on the likelihood of belonging to higher income clubs and a negative impact on the likelihood of belonging to lower income clubs. Public and other services have the opposite effect on the probability of regions' participation, with a unit increase in public services increasing participation in Clubs 4–7 and decreasing participation in Clubs 1–2 and 3. The manufacturing sector has the same sign as the

public and other sectors (decreases the probability of high-income club membership and increases the probability of belonging to low-income clubs) but does not show a significant effect on club formation. The spatial agglomeration characteristic of the ECE region (urban areas) is the second strongest significant determinant of club formation, clearly favouring high-income clubs. The role of transport geography accessibility, which reflects spatial interactions, is also a significant factor in club formation, supporting participation in higher income clubs.

DISCUSSION

Our research basically shows that in the new millennium, the ECE region is not experiencing global overall convergence and that there are clearly distinct convergence clusters in the geographical space in terms of gross value added per capita between 2001 and 2019. Based on the von Lyncker and Thoennessen club merging algorithm, seven geographic convergence clubs have been identified in the ECE region, which show a clearly distinct steady-state condition. Relative (conditional) convergence is observed within each club, which can be explained by the ordinal logistic regression method by including initial and structural as well as geographic-institutional factors.

During the period under review, the income paths of convergence clubs are clearly separated and persistent regional income gaps emerge. At the same time, the relative transition paths in GVA per capita started to widen already before the economic crisis of 2007–2008, and were further exacerbated by the crisis. This contradicts Cutrini's (2019) results for the EU27 at the regional level, with divergent processes starting earlier in the ECE region. The behaviour of convergence clubs follows Myrdal's (1957) circular cumulative causation theory and Krugman's (1991) new economic geography theory. The high-income (mainly urban metropolitan) clubs increase their incomes (the first two convergence clubs), while the low-income clubs (the bottom three clubs) become even poorer by 2019. Convergence clubs confirm the presence of different development (low and middle income) traps in the ECE region (Iammarino et al., 2020). The persistent behaviour of income paths is consistent with the characteristics of higher agglomeration regions (Bartkowska & Riedl, 2012; von Lyncker & Thoennessen, 2017; Cutrini, 2019; Cutrini & Mendez, 2023).

The distribution of the resulting multi-speed convergence clubs also reflects the urban-rural inequality at the lower aggregation level, similar to the results of von Lyncker and Thoennessen (2017), Bartkowska and Riedl (2012), Cutrini (2019) and Szakálné Kanó and Lengyel (2021). An important feature is that centre regions do not show a uniform development path (Smetkowski, 2018), but rather can be considered as multi-speed. Particularly striking are the

Budapest and Zagreb regions in Club 3, which lag behind other metropolitan areas, and the Katowice-centred Upper Silesian urban area, which has the largest population in the initial period. In ECE convergence clubs, which also describe the centre-periphery situation, our results show that population agglomeration is one of the causes of cumulative causality, in which case it can be reasonably assumed that it also means the drain of educated active population from underdeveloped spaces (Smetkowski & Wójcik, 2012; Smetkowski, 2018; Cutrini, 2019). According to our analysis – and confirming the theory of the new economic geography – urban-rural divisions and related spatial interactions thus contribute to the increase of regional inequalities (Gerritse & Arribas-Bel, 2018) and will lead to a further deepening of metropolisation and marginalisation in the future as well.

The formation of convergence clubs and the process of club convergence are mostly related to initial conditions, including initial GVA per capita. This is most consistent with the results of von Lyncker and Thoennessen (2017) and slightly different from the ordered logistic regression outputs of Bartkowska and Riedl (2012) and Cutrini (2019). The sign of patent activity, which we used as a proxy for human capital in the ordered logistic regression, is as expected but it is not a significant explanatory factor for club convergence. This is in line with the results of Iammarino et al. (2020), who argue that the process of innovation is a region–specific phenomenon and as such does not represent a general 'panacea' for regional economic performance. On the other hand, the convergence of the knowledge economy is not typical in the ECE region for complex reasons: the weakness of national innovation systems, the persistent technology gap between old and new Member States, R&D imports, the weakness of institutional capacities and the weak innovation readiness of firms (Veugelers, 2011; Rodríguez-Pose & Wilkie, 2017; Karbowski, 2017; Papava, 2018).

Structural characterics factors seem to be less influential determinants in explaining club convergence (similarly to von Lyncker & Thoennessen, 2017). Our results confirm the structural economic characteristics of the ECE region in line with the research work of Capello and Cerisola (2023). The effect of the market service sector in promoting club convergence and regional disparities is a reflection of the economic evolutionary processes of the period characterising this stage of development in ECE regions (Capello & Cerisola, 2023). According to calculations by Iammarino et al. (2020), employment rate in the sector increases the escape from the trap of middle-level development. This, although our research takes a different approach, is ultimately in line with our calculation: staying in developed clubs is facilitated, while leaving low-income clubs is supported by increased sectoral role. Employment rate in public and other services supports trapping, especially in low-income regions (Iammarino et al., 2020), which is a partially parallel result to our analysis. Higher non-market (i.e. public and

other) services lead to ‘sheltered’ economies, protected from cyclical downturns but unable to take advantage of cyclical periods (Iammarino et al., 2020).

Cutrini (2019) has identified the presence of the manufacturing sector as a key determinant of club convergence in the EU, facilitating the positions of developed regions. Industrial efficiency gains have a prominent role in the regional transformation of East Central Europe in the new millennium (Capello & Cerisola, 2023), while Smetkowski (2015) argues that the presence (unsuccessful renewal or transformation) of traditional industrial regions is a major development constraint in the region.

It is important to underline that, despite the socio-economic transformation of the ECE region, the initial conditions of the new millennium have fundamentally determined the trajectories of the income clubs, and clearly continue to have a lasting impact on them.

Neighbourhood effects indicate a distinctive spatial pattern, but provide a complex picture in explaining club convergence in East Central Europe. The spatial autocorrelation results partially confirm the significant phenomenon of metropolisation, similar to the work of Smetkowski and Wójcik (2012), Crespo Cuaresma et al. (2014), Smetkowski (2018), Gorzelak (2020). The polycentric development that fosters the emergence of convergence clubs is only static or dynamic in countries with larger populations. At the same time, spatial autocorrelation results adequately mediate marginalisation processes and the circular cumulative causation backwash effects of Myrdal (1957), with slow growth also restraining the growth of neighbours. This is also reflected in the distribution of convergence clubs, similar to Smetkowski (2015) (e.g. in Bulgaria or Eastern Croatia) and Ayouba and LeGallo (2019). The breakdown of national borders (as barriers) in East Central Europe shows partial positive local externalities, in fact, the spatial orientation towards the West is significantly reflected in the organisation of economic space and the formation of convergence clubs. This further supports Gorzelak’s (2020) picture of regional transformation for the ECE region (i.e. the presence of ‘leaders’ and ‘winners’ spaces). Moreover, based on Rodríguez-Pose and Tselios (2015) and Annoni and Rubianes (2016), the spatial autocorrelation results are also hypothesized to be influenced by macro-level socio-economic policies and national institutions, which is supported by our results. In addition to ‘traditional’ socio-economic interactions (knowledge spillovers, labour flows, economies of scale, etc.), national and supranational institutional structures are also important shapers of regional development, especially during the transformation of the ECE region (Cutrini, 2019; Gorzelak, 2020). All these features, as expressed by spatial autocorrelation studies, add complexity to the phenomenon of regional club convergence in the ECE region.

CONCLUSION

In our study, we investigated the presence of economic convergence clubs and club convergence at NUTS3 level for Gross Value Added per capita in the East Central European region. In doing so, we aimed to contribute to the understanding of the transformation and convergence in East Central Europe in the new millennium.

The novelty of our analysis lies in the fact that the investigated phenomenon has not yet been examined in the extended East Central European region using such a complex and integrated quantitative methodological framework.

For this purpose, we first applied the log t-test of Phillips and Sul and the von Lyncker–Thoennessen cluster merging algorithm in order to delineate regions (convergence clubs) with similar income steady-state conditions. Subsequently, ordinal logistic regression was used to detect the factors influencing the formation of income-based clubs.

Our results show that there is no global convergence within the ECE region, with seven geographically distinct convergence clubs in the first two decades of the new millennium. In other words, the region shows 'multi-speed' economic development, with significant and persistent differences between income clubs. Our results show that regions with almost a quarter of the population have reached the average GVA per capita of the EU15, while for 40 percent of the population in the ECE region no substantial improvement or convergence is expected. The geographic distribution of clubs does not necessarily follow 'traditional' inequalities, with centres and peripheries also showing 'multi-speed' development. So our first hypothesis is confirmed.

The emergence of ECE convergence clubs, despite the transformation processes, is fundamentally determined by the characteristics of the initial period (initial development, changes in active population, agglomeration characteristics, spatial interactions, economic structure characteristics, neighbourhood relations). All these results are consistent with those reported in the international literature and confirm the club convergence hypothesis in the ECE region. Thus our second hypothesis is confirmed.

Although our analysis is not based on GDP calculated at traditional purchasing power parity, the results certainly point to differentiated spatial paths behind regions of regional policy interventions. It is important to highlight that these paths go beyond NUTS2 regions, but also beyond NUTS3-based (e.g. urban-rural) delimitations. In our view, the results point to a persistent phenomenon of spatial and temporal dependence of economic development, which is a real problem in the ECE region.

Our results confirm that both EU and national regional policies must abandon the ‘one-size-fits-all‘ approach and instead be tailored to the specific characteristics of convergence clubs through place-based interventions. In developed metropolitan regions, sustaining growth should be supported through smart specialisation and digitalisation, whereas in peripheral, low-income areas, overcoming structural disadvantages requires targeted investments in (transport) infrastructure and human capital. Furthermore, strengthening cross-border cooperation based on spatial proximity is essential for enabling lagging regions to catch up. The effectiveness of cohesion policy depends not only on the volume of financial resources, but also on the implementation of appropriate structural reforms, such as improving institutional quality (Iammarino et al. 2020).

Although the empirical scope of this study is limited to data available up to 2019, subsequent developments – including the COVID-19 pandemic, escalating geopolitical tensions, and increasing inflationary pressures – may have significantly influenced regional economic dynamics across Europe. These events could have altered the pace and spatial patterns of convergence in certain areas. Nevertheless, we maintain that the structural patterns and spatial mechanisms identified in this study remain valid (core-periphery divide, agglomeration advantages, structural economic weaknesses in lagging regions), providing a robust theoretical and methodological foundation for comparative and longitudinal analyses in the post-2019 period.

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Appendix 1 List of variables

variable	definition	source
Initial GVA per capita	GVA divided per population (PPP, constant price, base year 2015, logs, 2001)	OECD Regional Database
population growth	growth of active population (15-64) between 1995 and 2000	ESPON, own calculation
employment rate	employment rate in percent of total population (2001)	ESPON, Eurostat Regional Database, own calculation
patent activity	high tech patent per million capita (2001)	OECD Regional Database, own calculation
manufacturing	gross value added in manufacturing sector as a share of total gross value added (2001)	ARDECO Database, own calculation
market services	gross value added in Wholesale and retail trade; transport; accommodation and food service activities; information and communication and financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service activities sector as a share of total gross value added (2001)	Eurostat Database, own calculation
public services and other services	gross value added in Public administration and defence; compulsory social security; education; human health and social work activities; arts, entertainment and recreation, repair of household goods and other services sector as a share of total gross value added (2001)	Eurostat Database, own calculation
urban areas (dummy)	dummy variable of predominantly urban regions (NUTS level 3 regions where more than 80 % of the population live in urban clusters) (1–yes, 0–no)	Eurostat Database, own calculation
remote areas (dummy)	dummy variable of remote regions (A predominantly rural or intermediate regions is considered remote if less than half of its residents can drive to the centre of a city of at least 50 000 inhabitants within 45 minutes) (1–yes, 0–no)	Eurostat Database, own calculation
V4 dummy	dummy variable of NUTS3 regions in V4 countries (Czechia, Hungary, Poland, Slovakia) (1–yes, 0–no)	own calculation

Original scientific paper

DEVELOPING CREATIVE ECOTOURISM EXPERIENCES IN NANBENG VILLAGE: A SUSTAINABLE APPROACH TO DESTINATION MANAGEMENT

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Abstract

The objective of this study is to (1) assess the current state of ecotourism practices in Nanbeng Village and understand its impact on the local environment and community; (2) identify and develop innovative and sustainable ecotourism experiences that are immersive and educational while ensuring the conservation of the village's natural and cultural heritage; and (3) evaluate how these sustainable ecotourism strategies can bolster the economic development of Nanbeng Village without compromising the integrity of its natural resources. Through a qualitative research methodology, this study will employ field observations, semi-structured interviews with local residents, local government officials, private sectors, and tourists, totaling 20 people, to understand existing tourism practices and identify opportunities for innovative ecotourism experiences. This study will also consider how such experiences could enhance the economic development of the community while preserving its natural resources. This investigation augments the comprehensive comprehension of ecotourism within border territories, positing a universally relevant framework for the advancement of sustainable tourism that can be modified by rural collectives worldwide. Furthermore, it provides actionable insights to guide tourism policy and planning in Nanbeng Village, offering a practical blueprint for managing natural resources effectively while leveraging them sustainably for tourism.

Keywords: ecotourism, creativity, sustainable tourism, destination management, Nanbeng Village

INTRODUCTION

The remarkable progressions accomplished by the tourism sector in China have solidified its status as a pivotal benefactor to the nation's economy, as stated by Gao et al. (2009). For its potential to promote environmental protection and socioeconomic development, ecotourism has drawn great interest from both academics and industry professionals (TIES., 2015). China's potential to utilize ecotourism as a means for environmental preservation and economic advancement has garnered increased attention, as per Ahmad et al. (2018) findings. Sustainability and the protection of natural areas are at the heart of ecotourism (Khan et al., 2020; Machnik, 2021). Equal progress is sought in the areas of the environment, society, and the economy (Almeida & Dieguez, 2021). Bhatt (2020) argues that ecotourism's positive effects

on local economies and biodiversity make it a "win-win" for everyone involved. Locals may earn money from tourists while also being incentivized to help preserve their environment. Responsible tourism is becoming increasingly popular, and for good reason: it aims to reduce negative effects on natural and cultural resources while bolstering preservation efforts (Buckley, 2009; Stronza et al., 2019). Ecotourism possesses the capacity to mitigate poverty in the vicinity of conservation areas by introducing novel avenues for livelihood to the local populace (Liu et al., 2012). However, the realization of ecotourism encounters an array of obstacles that require overcoming. In spite of these impediments, ecotourism may yield advantageous outcomes for the environment and the native communities. With the global rise in travel, there's an increasing interest in destinations that offer both natural beauty and a rich cultural backdrop, like the border regions which present a unique blend of both these elements. Nanbeng Village, located in the picturesque Yunnan Province of China, epitomizes such a destination. Positioned as a border settlement, Nanbeng boasts of its distinctive geographical context, abundant natural resources, and a profound traditional heritage. While this combination has the potential to turn the village into a sought-after ecotourism spot, the challenges of sustainable management in such regions are complex, particularly when it comes to balancing economic development with environmental and cultural conservation (Li, 2004). Overcrowding, habitat degradation, and increased pollution are some of the potential consequences if tourism exceeds the environment's capacity to cope with visitor volume (Che, 2002). Sustainable ecotourism that does not negatively impact local populations or the natural environment requires careful planning, regulation, and monitoring (Kimengsi et al., 2019).

Existing research has shed light on the global tactics and effects of ecotourism. Border areas with distinctive social, economic, and political positions and the presence of historical and natural attractions are becoming increasingly attractive for tourism (Safdari Molan et al., 2021). However, as identified in the research gap, there remains an evident dearth of qualitative research focusing specifically on the unique dimensions presented by border regions like Nanbeng Village. The nuances of these areas, from their cultural amalgamation to the potential environmental challenges, necessitate tailored approaches to ecotourism. The notion of ecotourism champions the cause of safeguarding the environment, imparting environmental knowledge and fostering reverence for the customs of the indigenous community (Wibowo et al., 2023). Such tailored strategies are imperative not only to ensure the conservation of the region's invaluable resources but also to optimize its economic potential in a sustainable manner.

In light of this context, this study embarks on a journey to explore the current state of ecotourism in Nanbeng Village, delving deep into its impact and the potential for innovative, sustainable practices. This study is to establish a comprehensive knowledge of ecotourism in Nanbeng by gathering the viewpoints of a wide range of stakeholders, from local inhabitants to government officials, and to give practical insights that help influence the industry's future in a sustainable path.

THEORETICAL BACKGROUND

The Concept and Significance of Ecotourism

The notion of ecotourism centers around ethical travel to natural regions that conserves the environment and enhances the wellbeing of local populations (Lee & Jan, 2017). It offers visitors a learning experience and delivers eco-related knowledge and environmental protection measures. Planning and understanding stakeholder interests are crucial to ecotourism success (Siregar et al., 2022; Submitter et al., 2020). Ecotourism seeks to reconcile economic growth with environmental and cultural preservation. This is done through promoting sustainable activities and reducing environmental damage. The sub-sector of the tourism industry which exhibits the highest rate of growth is presently perceived to be the fastest-growing (Dinç et al., 2023; Gonfa, 2020). Ecotourism helps conserve natural resources, biodiversity, and vulnerable ecosystems. It generates cash and jobs for locals, especially in rural areas where other livelihoods are scarce (Saragih et al., 2022). Nature, culture, and the human influence on the environment are all things that ecotourists learn more about. Ecotourists' activities are impacted by their environmental views, social norms, sense of agency, and trip value (Lee & Jan, 2017). Managers of ecotourism locations can boost visitors' learning experiences and environmental attitudes through the introduction of wearable augmented reality applications and highlighting the themes of ecological catastrophe or climate change (Lee & Jan, 2017). Ecotourism is a sort of responsible travel that gives economic advantages to local people and protects the environment (Dinç et al., 2023). It delivers a sustainable and ecologically friendly tourism experience that contains components of learning and education (Siregar et al., 2022). Ecotourism strategies improve local economy and safeguard natural resources (Saragih et al., 2022). Ecotourism offers opportunities for improving livelihood security and incentivizing conservation efforts by involving local communities (Khan et al., 2020). Ecotourism promotes ethical, environmentally friendly travel that benefits local communities. Its relevance rests in its capacity to promote environmental protection, generate economic advantages, cultivate cultural appreciation, and boost the well-being of both the environment and local populations.

By applying sustainable practices and encouraging education and awareness, ecotourism attempts to combine economic development with environmental and cultural protection. Chinese tourists exhibit a good understanding of ecotourism and are motivated by environmental concerns, which suggests a strong potential for achieving mass park-visitor symbiosis in the ecotourism market (Li et al., 2024). The high-quality development of tourism (HQDT) in China is guided by principles of innovation, coordination, green development, openness, and sharing, with significant contributions from government guidance, innovation, and regional cooperation (Wang et al., 2022). In Transylvania, Romania, the preservation of wood-pastures through traditional agricultural practices has maintained significant biodiversity, which, despite limited tourist flows, has the potential to boost local ecotourism if adequately promoted and supported by authorities (Vijulie et al., 2024). In Poland's Gryfino County, the slow development of tourism despite abundant natural and cultural attractions underscores the importance of local community involvement in recognizing and capitalizing on tourism potential (Głąbiński & Duda, 2017). Similarly, the perceptions of rural Serbian inhabitants regarding the economic, social, and environmental advantages of sustainable tourism play a crucial role in shaping their endorsement of tourism projects. This underscores the importance of community engagement and perceived standard of living in cultivating favorable stances towards the advancement of tourism (Demirović Bajrami et al., 2020). In both geographical areas, nevertheless, the primary objective persists unchanged: to harmonize economic expansion with ecological durability, utilizing technological progress and interregional collaboration to improve ecological efficiency and foster the advancement of sustainable tourism.

Challenges and Opportunities in Border Regions

Border regions like Nanbeng Village present both unique challenges and opportunities for ecotourism. The development of cross-border tourism can face challenges due to the decline in tourism dynamics and the negative environmental effects of increased tourist flows (Maratovna et al., 2021; Więckowski, 2023). The challenges include: (1) The tourist sector is profitable, and a shifting climate might make ecotourism growth difficult. It is important to continuously adapt to market trends and maintain a competitive advantage (Che, 2002). (2) Environmental impacts: Tourism may generate congestion, ecological degradation, and pollution. Managing visitor volume and implementing sustainable practices are crucial to minimize these impacts (Che, 2002). (3) Unrealistic expectations: Local communities in border regions may have unrealistic expectations about the potential of tourism for regional growth. Managing these

expectations and ensuring realistic development plans are important for sustainable ecotourism development (Prokkola, 2010). (4) Identity and cultural preservation: The commercialization and standardization of local culture and tourist services can pose challenges to the preservation of local identity and values. Balancing tourism development with cultural preservation is essential for maintaining the authenticity of the destination (Dunets et al., 2019).

Nevertheless, within the tourism sector, there exists an abundance of occasions for both growth and collaboration, particularly in rural locales, through the utilization of the innate, cultural, historical, and economic circumstances inherent to border regions (Menbere & Admassu, 2020; Tambovceva et al., 2020). The opportunities include: 1. Cross-border cooperation: Opportunities for international tourist collaboration abound in border locations. Collaborative efforts between neighboring countries can lead to the creation of unique cross-border tourism products and experiences (Prokkola, 2010). 2. Utilization of natural and cultural potentials: Border regions often have rich natural and cultural resources that can be utilized for tourism development. By leveraging these potentials, border regions can create competitive tourism products and attract visitors (Nestoroska, 2022). 3. Increased competitiveness and employment opportunities: Developing border regions as recognizable tourist destinations can increase their competitiveness and create employment opportunities for the local population. This can contribute to the overall socio-economic development of the region (Nestoroska, 2022). 4. Funding opportunities: Funding programs, such as INTERREG, can provide valuable financial support for tourism projects in border regions. Accessing these funds can help overcome financial constraints and support sustainable cross-border cooperation in tourism (Shepherd & Ioannides, 2020).

In conclusion, border regions' ecotourism development faces challenges related to competitiveness, environmental impacts, unrealistic expectations, and cultural preservation. However, there are opportunities for cross-border cooperation, utilization of natural and cultural potentials, increased competitiveness, and access to funding programs. Border regions may achieve sustainable and responsible ecotourism development by tackling these issues and making the most of possibilities.

Balancing Economic Development with Conservation

Achieving equilibrium between the advancement of economy and preservation of nature in ecotourism necessitates meticulous strategizing and administration. Here are some strategies and considerations:

(1) Sustainable tourism practices: Sustainable methods are crucial to reducing tourism's environmental impact. This includes reducing waste, conserving energy and water, promoting biodiversity conservation, and supporting local communities (Cater & Cater, 2007).

(2) Stakeholder engagement: To attain optimal planning and discernment, it is imperative that the community denizens, governing agencies, non-state actors, and other pertinent stakeholders are integrated into the process. This ensures that their perspectives and interests are considered, and fosters a sense of ownership and responsibility for conservation efforts (Cater & Cater, 2007).

(3) Environmental education and interpretation: Provide educational opportunities for tourists to learn about the local environment, biodiversity, and conservation efforts. Interpretive programs, guided tours, and signage can help raise awareness and promote responsible behavior (Tisdell & Wilson, 2005).

(4) Monitoring and regulation: Establishment of sophisticated monitoring systems is imperative to accurately evaluate and comprehend the multifaceted environmental impacts of ecotourism activities. Implement regulations and guidelines to ensure compliance with sustainable practices and protect sensitive ecosystems (Tisdell & Wilson, 2005).

(5) Economic benefits for conservation: Demonstrate the economic value of conservation to local communities and stakeholders. Show how ecotourism can provide financial support for nature conservation efforts, creating incentives for conservation and counteracting pressures for extractive economic activities (Tisdell & Wilson, 2001).

(6) Carrying capacity management: To prevent overcrowding and mitigate adverse effects, it is imperative to ascertain the carrying capacity of the ecotourism site. This involves setting limits on visitor numbers, managing visitor flows, and maintaining the ecological and cultural integrity of the destination (Butarbutar & Soemarno, 2013).

(7) Partnerships and collaboration: Promote partnership between government, NGOs, local communities, and tourist businesses. Collaborative efforts can lead to shared resources, knowledge exchange, and coordinated conservation initiatives (Rahman et al., 2022).

(8) Research and monitoring: Undertake an investigative inquiry aimed at evaluating the effects of the practice of ecotourism on both the natural surroundings and the neighboring societies. Regular monitoring and evaluation help identify potential issues and inform adaptive management strategies (Tisdell & Wilson, 2005).

By implementing the aforementioned strategies and taking into account the cited references, ecotourism can adeptly achieve equilibrium between economic progress and conservation, thereby guaranteeing the enduring sustainability of both the natural milieu and indigenous communities.

Innovative Strategies for Sustainable Ecotourism

The implementation of progressive tactics aimed at ensuring the viability of ecotourism can be categorized into six distinct perspectives. These strategies include:

(1) Market segmentation and innovative marketing: Market segmentation research should consider all relevant criteria, including sustainability, to ensure supply match's demand. Innovative marketing practices can create demand for sustainable ecotourism products and influence market behavior towards sustainability (Beaumont, 2011).

(2) Idealistic models for community-based ecotourism: Designing conceptual frameworks for sustainable ecotourism that are congruent with the distinctive attributes and requirements of indigenous populations may avert marginalization and ensure their active participation in the growth of tourism (Nugeraha et al., 2022).

(3) Emphasizing the sustainability criterion: The sustainability criterion in ecotourism incorporates environmental, social, and economic elements. The incorporation of sustainability into ecotourism products and practices can serve as a distinguishing factor from other tourism products and guarantee adherence to sustainable principles, as posited by Beaumont (2011).

(4) Community attitudes and support: Comprehending and tackling the communal outlooks and endorsement of ecotourism holds paramount importance in the realm of enduring progress. Factors such as perceived benefits, conservation awareness, and local benefits influence community support for ecotourism initiatives (Moswete et al., 2020).

(5) Mapping potential zones for ecotourism: According to Roque Guerrero et al. (2020), the utilization of geographic information systems (GIS) can function as a guide for sustainable development and landscape resilience by identifying regions that demonstrate a greater potential for promoting ecotourism. This approach helps in spatial planning and identifying suitable areas for ecotourism activities.

(6) Compliance with sustainability criteria: Compliance with the sustainability criterion of ecotourism leads to the implementation of environmentally responsible practices and

management systems. Obtaining eco-accreditation and implementing sustainable practices can position ecotourism operators at the upper end of the price scale (Beaumont, 2011).

Stakeholder Engagement in Ecotourism Planning

Stakeholders' input throughout ecotourism planning is vital for the project's success. It allows for the understanding of stakeholder interests and levels of influence, which helps in managing their engagement effectively (Lalicic & Weber-Sabil, 2022). The involvement of stakeholders is necessary to achieve sustainability in a tourism destination (Submitter et al., 2020). Nonetheless, inadequate stakeholder collaboration may impede the triumph of ecotourism (Salman, Jaafar, & Mohamad, 2021). Poor interactions and collaborations among stakeholders can lead to the degradation of natural resources and neglect of communities, undermining the long-term survival of ecosystems and communities themselves (Wondirad et al., 2020). To address this, a multi-stakeholder management model is needed to unite stakeholders towards achieving sustainable ecotourism (Wang et al., 2021).

(1) Awareness and participation: Stakeholder engagement helps create awareness and promote participation in ecotourism initiatives. It allows stakeholders to understand the benefits and potential impacts of ecotourism, leading to increased support and involvement (Ogunjinmi & Braimoh, 2018).

(2) Collaboration and consensus-building: Engagement of various stakeholders facilitates the establishment of mutual collaboration and consensus-building amongst diverse groups. This collaborative approach helps reach agreements, address concerns, and develop shared solutions, increasing the likelihood of successful implementation (Kenawy et al., 2017).

(3) Tokenistic engagement: Tokenistic engagement, where stakeholders are involved superficially or as a formality, can hinder the success of ecotourism projects. Genuine and meaningful engagement is necessary to ensure stakeholders' perspectives are considered and their interests are addressed (Kenawy et al., 2017).

(4) Community involvement and empowerment: Participation in decision-making processes is a strong instrument that may provide local communities a feeling of ownership when done through stakeholder engagement. This involvement enhances the success and sustainability of ecotourism projects by aligning them with local needs and aspirations (Kia, 2021).

(5) Stakeholder interests and influence: Understanding stakeholders' interests and their level of influence is crucial for effective engagement. Recognizing and effectively managing the

interests of significant stakeholders is a crucial factor in surmounting obstacles and securing their backing for the project, as posited by Salman, Jaafar, Mohamad, et al. (2021).

(6) Stakeholder management: Effective management of stakeholders is a crucial component of implementing ecotourism successfully. Successful project outcomes depend on stakeholder parity, incorporating their input into project planning and decision-making, and considering their concerns and complaints (Salman et al., 2022).

(7) Challenges and barriers: Various challenges and barriers can hinder stakeholder engagement in ecotourism planning. These include deficiencies in operationalizing engagement, institutional limitations, stakeholder attitudes, and perceptions (Kenawy et al., 2017). Identifying and remedying these challenges holds significant importance for the efficacious engagement of stakeholders.

Research Gap

The broad literature review highlights substantial insights into ecotourism definitions, significance, strategies, and challenges; however, several critical research gaps persist. Firstly, while stakeholder engagement is recognized as essential for effective ecotourism (Lalicic & Weber-Sabil, 2022; Salman, Jaafar, & Mohamad, 2021), there remains limited empirical exploration of stakeholder perceptions in border regions. This gap could significantly hinder the development of tailored engagement strategies (Xu et al., 2023). Secondly, although technological innovations have begun shaping sustainable ecotourism practices (Lee & Jan, 2017; Pavlidis et al., 2022), there is a scarcity of comprehensive evaluations concerning how advanced technologies can enhance ecotourism management and visitor experience, particularly in border regions. Thirdly, existing studies have identified both opportunities and challenges inherent to border regions (Maratovna et al., 2021; Więckowski, 2023), yet in-depth case analyses addressing specific political, policy-related, and cultural dynamics are still relatively limited, necessitating further investigation (Navrátil et al., 2015; Navrátil et al., 2013). Furthermore, the enduring sustainability ramifications of ecotourism methodologies continue to be insufficiently examined, thereby emphasizing the imperative for longitudinal investigations that assess persistent socio-economic impacts and ecological robustness (Sobhani et al., 2023). Community dynamics, including internal power structures and decision-making processes within local communities, are also inadequately explored, despite their importance for successful ecotourism implementation (Mingjing, 2024). Furthermore, the literature identifies a notable lack of specific economic models or frameworks suited to balancing economic benefits with conservation efforts, especially in sensitive border areas

(Cater & Cater, 2007; Tisdell & Wilson, 2005). Training methodologies tailored for local community capacity building and stakeholder education also require deeper exploration, particularly in region-specific contexts. Lastly, resilience strategies designed to mitigate external shocks such as pandemics and economic downturns in vulnerable ecotourism areas have not been comprehensively explored, emphasizing a critical need for strategic adaptability research. Addressing these gaps could significantly enhance ecotourism management strategies and promote sustainable development in diverse regions worldwide.

Building upon the identified research gaps, especially those relating to stakeholder perceptions, sustainable development strategies, and balancing economic growth with ecological preservation, this study seeks to address these critical areas through a comprehensive examination of ecotourism in Nanbeng Village, a unique border region. To direct this study, the subsequent research inquiries have been crafted:

RQ 1: What are the existing ecotourism practices in Nanbeng Village, and how have they impacted the local environment and community?

RQ 2: What are the potential innovative ecotourism experiences that can be developed in Nanbeng Village, emphasizing sustainability, immersion, and education?

RQ 3: How can the proposed sustainable ecotourism strategies contribute to the economic upliftment of Nanbeng Village while ensuring the conservation of its natural and cultural resources?

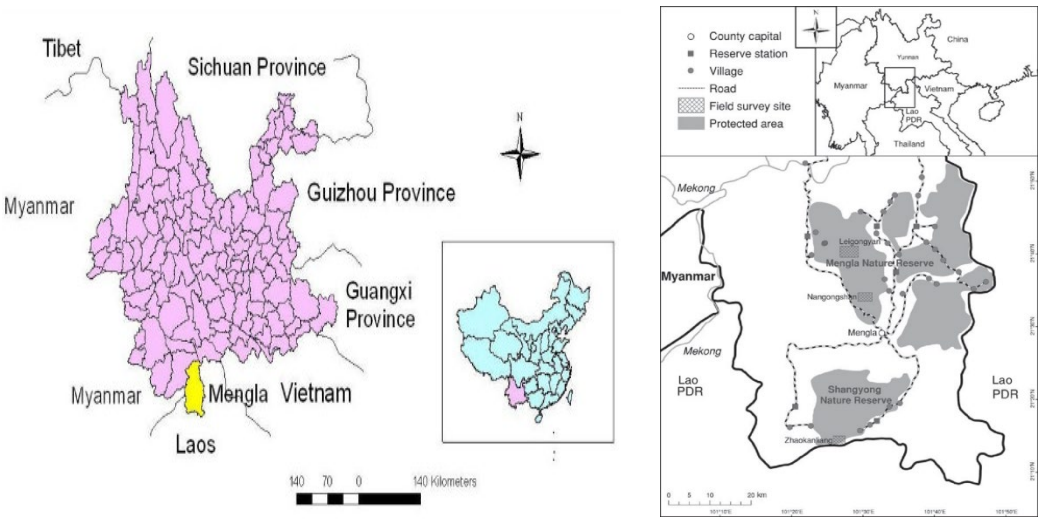
DATA AND METHODS

This study adopts a qualitative research approach. Qualitative research allows for an in-depth understanding of the intricacies and dynamics of ecotourism in Nanbeng Village, particularly given its unique status as a border region. By utilizing qualitative methodologies, researchers are able to gain profound insights concerning the creation, implementation, and interpretation of assessments and evaluations, in addition to investigating the behavior, perceptions, emotions, and comprehension of examinees (Rahman, 2020). This approach permits researchers to exhibit flexibility in their methodology, modifying their techniques and methods to suit the specific research setting and objectives. It is particularly advantageous when exploring topics that are arduous to quantify or necessitate a more extensive comprehension of the societal and cultural milieu (De Oliveira, 2023). The approach is tailored to capture nuanced insights from local stakeholders and to unravel the cultural, environmental, and economic subtleties of the region that might not emerge from a purely quantitative approach.

Research Site and Context

The research is focused on Nanbeng Village (Figure 1), a border settlement in Mengla County, Yunnan Province, China. The village has been selected due to its rich natural and cultural heritage, coupled with its unique position as a border region, making it both challenging and essential for ecotourism development.

Figure 1 Location of Nanbeng Village, Mengla County, Yunnan Province, China



Nanbeng Village serves as an extension of Mandan Village and is under the jurisdiction of the Mandan Village Committee located in Mengla Township. This village is situated in a semi mountainous region, positioned 6 kilometers away from the Mandan Village Committee and 15 kilometers away from Mengla Township. With an annual precipitation range of 1200-1600 millimeters, Nanbeng Village offers favorable conditions for cultivating various crops such as grain, rubber, sugarcane, and tea. Moreover, the village encompasses 4690 acres of forest land. Under the jurisdiction of Nanbeng Village, there exists one natural village, which consists of 86 households and a rural population of 458 individuals. Within this population, there are 458 individuals engaged in agricultural activities, forming a labor force of 250 individuals. Specifically, 240 individuals are involved in primary industry occupations. The primary sources of income for farmers in this village include rubber, grain, fishing, and tourism. Furthermore, on December 31, 2019, Nanbeng Village was selected to be included in the second batch of national forest and rural lists.

Data Collection

The researcher will conduct several field visits to Nanbeng Village to observe the existing tourism practices firsthand, the state of natural resources, and the interactions between tourists and locals. This will involve photographing sites, taking notes on visitor behaviors, and understanding the logistics of the current tourism operations. Relevant documents such as local tourism policies, historical records of Nanbeng Village, and previous research or reports on tourism in the area will be analyzed to understand the historical and policy context.

In qualitative research, the non-probability sampling approach of "purposive sampling" is frequently used. This method requires picking examples that are both informative and pertinent to the research question at issue (Palinkas et al., 2013). It involves deliberately selecting participants or cases based on specific characteristics or criteria that align with the research objectives (Tongco, 2007). This sampling method is particularly effective when studying a specific cultural domain or when seeking knowledgeable experts in a particular field (Tongco, 2007). It allows researchers to target specific cases or individuals who can contribute unique perspectives and rich data to the study (Palinkas et al., 2013). A total of 20 individuals will be interviewed, including 7 local residents, 4 government officials, 3 private sector representatives, and 6 tourists (Table 1). A semi-structured format will allow for consistency across interviews while providing flexibility to explore emerging themes or unexpected insights.

Table 1 Stakeholders with their information

Code No. of Participants	Gender	Occupation
S1	Female	Committee Member of Township
S2	Male	Committee Member of Village
S3	Male	Committee Member of Village
S4	Male	Committee Member of Village
S5	Female	Tour Operator
S6	Male	NGOs
S7	Male	NGOs
S8	Female	Local Resident
S9	Male	Local Resident
S10	Female	Local Resident
S11	Female	Local Resident
S12	Male	Local Resident
S13	Male	Local Resident
S14	Female	Local Resident
S15	Male	Tourist
S16	Male	Tourist
S17	Female	Tourist
S18	Male	Tourist
S19	Male	Tourist
S20	Female	Tourist

A non-probability selection approach known as "purposive sampling" was used to choose the 20 participants. The main objective of this sample procedure was to get a comprehensive assortment of viewpoints that are pertinent to the examination of ecotourism. This was particularly important due to the distinct attributes and individuals involved in this field. Here are the specific criteria for the selection:

(1) Local Residents (7 individuals):

- Residency: Must have resided in the region for at least ten years to ensure a deep understanding of the locale and the changes over time.
- Diversity: In order to comprehensively encompass a wide array of experiences and viewpoints, it is imperative to integrate individuals across a spectrum of age cohorts, genders, and occupational histories.
- Involvement: Priority will be accorded to persons who have had firsthand or indirect involvement with ecotourism efforts, whether as recipients, partners, or even as evaluators.

(2) Government Officials (4 individuals):

- Position: Must hold or have held a role in local or regional governance associated with tourism, environment, or community development.
- Experience: Minimum of five years in their respective positions to ensure they have a comprehensive understanding of policies, challenges, and strategies.

(3) Private Sector Representatives (3 individuals):

- Affiliation: Must be associated with businesses or NGOs directly related to ecotourism – this could include tour operators, hoteliers, or conservation organizations.
- Influence: Ideally in decision-making positions or roles where they shape the direction or practices of their respective entities in relation to ecotourism.
- Track Record: Should have a demonstrated commitment to sustainable practices and community engagement.

(4) Tourists (6 individuals):

- Experience: Tourists who have visited multiple ecotourism destinations, not just the local under study, to provide comparative insights.
- Engagement: Preference for tourists who have engaged with local communities or have a deep interest in sustainable tourism practices.

Interviews were structured according to a comprehensive protocol:

Interview Duration: Each semi-structured interview lasted approximately 45-60 minutes, allowing adequate time for participants to share detailed responses and for researchers to clarify and explore key points.

Mode of Interview: Interviews were primarily conducted face-to-face, in quiet, private locations within Nanbeng Village to ensure comfort and minimize distractions.

Interview Questions: Questions were crafted to be open-ended, facilitating rich qualitative data. Sample questions included inquiries about community changes due to ecotourism, policy challenges, sustainability practices, and comparative tourism experiences.

Ethical Considerations: All participants engaged in the study were duly apprised of the research aims, methodologies, possible risks, and advantages prior to their involvement. Informed consent was obtained in writing from all interviewees. Participants were explicitly apprised of their entitlement to disengage from the research at any point without facing any adverse consequences.

Sensitive Topics Management: The researcher proactively identified and mitigated sensitive topics by clearly communicating confidentiality measures, reassuring anonymity, and providing participants with opportunities to skip questions they found uncomfortable. Additionally, the interviewer was trained to manage sensitive responses respectfully and empathetically.

Two principal phases of data gathering transpired between the commencement of October and the middle of November in the year 2022. The initial visit involved informal interviews and observational assessments guided by local village representatives, providing foundational understanding. The second visit, from November 15th to 18th, included structured, recorded interviews that yielded detailed and significant qualitative data in the form of 20 complete interview transcripts.

Throughout the research process, meticulous field notes, photographs, and observational data were systematically documented to enhance data triangulation and deepen contextual understanding.

Data Analysis

Thematic analysis is a qualitative data analysis technique that involves recognizing, evaluation, and documenting of repeating motifs or trends within the dataset (Nowell et al., 2017). It is a flexible and widely used approach that allows researchers to explore and understand the

underlying meanings and patterns in the data (Nowell et al., 2017; Proudfoot, 2022). The thematic analysis procedure followed a structured, systematic approach as outlined below:

(1) Data Transcription:

- All audio-recorded interviews were transcribed verbatim to maintain accuracy and ensure all nuances and meanings were captured.

(2) Familiarization:

- The transcripts and observation notes were thoroughly reviewed multiple times to achieve comprehensive familiarity with the data.

(3) Initial Coding:

- Using NVivo qualitative analysis software (version 12), data were initially coded employing both predefined and emergent codes. The predefined codes were informed by existing literature and research objectives to ensure alignment with the theoretical framework of the study.

(4) Predefined Coding Scheme:

Predefined Codes	**Description**
Natural Resource Protection	Efforts to protect, conserve, and sustainably use local natural resources (forests, water sources, biodiversity).
Cultural Heritage Preservation	Initiatives and strategies aimed at conserving and promoting local culture, traditions, and identity.
Economic Impacts	Effects of ecotourism on local economic development, job creation, income diversification, and livelihood improvements.
Community Participation	Levels and forms of involvement of local residents in ecotourism activities and decision-making processes.
Educational Experiences	Components within ecotourism offerings that aim to educate tourists about environmental sustainability, culture, or community practices.
Sustainability Practices	Activities, practices, or policies adopted to ensure the sustainability of tourism operations.

(5) Identifying and Reviewing Themes:

- Codes were systematically categorized and grouped to identify broader themes. Emergent codes were added iteratively to address new insights and patterns not initially anticipated.
- Themes and sub-themes were reviewed and refined to ensure internal coherence and external distinctiveness.

(6) Defining and Naming Themes:

- Clear definitions and names were developed for each identified theme to represent accurately and succinctly the essence of each thematic pattern.

(7) Integration with Literature:

- Final themes were compared and contrasted against existing literature to identify congruencies, gaps, and unique contributions of this study.

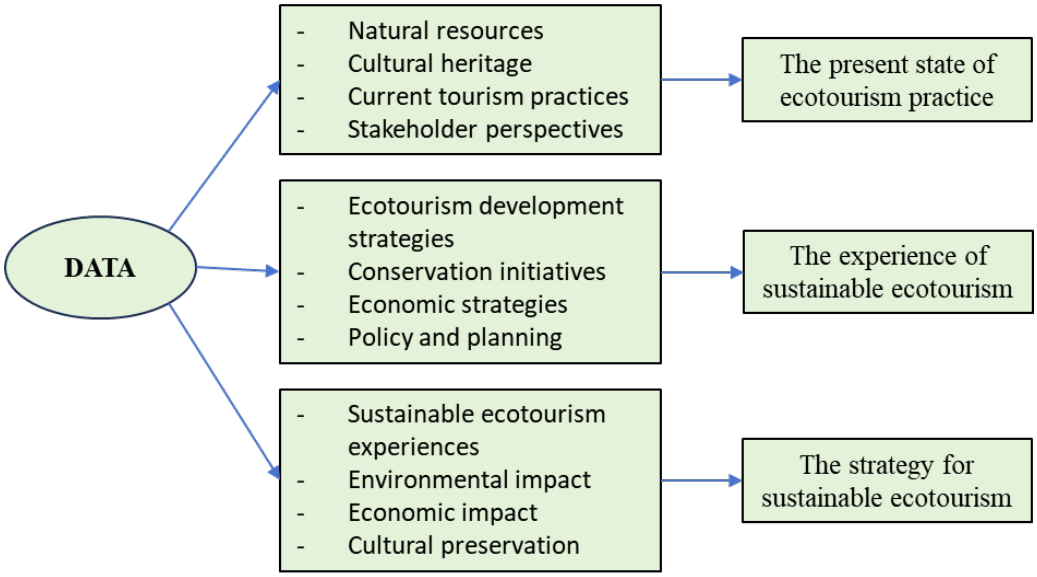
(8) Enhancing Analytical Rigor:

- Triangulation: Observational data, interview transcripts, and document analyses were cross-referenced to confirm and validate identified themes.
- Member Checking: Summaries of preliminary findings were shared with participants to verify accuracy and resonance with their expressed views.
- Reflective Journaling: Throughout the data analysis process, reflective notes were kept to document analytical decisions, personal biases, and methodological reflections, thus enhancing transparency and reflexivity.

RESULTS

Thematic analysis was applied to assess the comprehension of the participants, wherein all transcripts were subjected to analysis, resulting in the identification of three fundamental concepts. The research questions encompass three distinct areas, namely "the present state of ecological tourism practice," "the experience of sustainable ecological tourism," and "the strategy for sustainable ecological tourism." It is inevitable that the understanding of participants may exhibit overlaps, either with pre-existing categories or with one another. The findings of the research indicate that the comprehension of certain settings is effectively elucidated, and the concepts are inherently comparative. The results gathered from interviews and on-site observations, as depicted in Figure 2, reveal three prominent themes pertaining to Nanbeng Village. These themes underscore the significance of implementing a sustainable destination management approach in order to foster the growth of a unique and innovative ecotourism experience inside the village. The topics encompassed in this discussion are “the present state of ecological tourism practice”, “the experience of sustainable ecological tourism”, and “the strategy for sustainable ecological tourism”.

Figure 2 Thematic framework



The present state of ecotourism practice

The present state of tourist practices in Nanbeng Village can be concisely outlined based on interviews conducted, focusing on the following aspects:

- **Natural resources**

Everyone that the researcher interviewed agreed wholeheartedly: Nanbeng Village is truly blessed with nature's bounty. For example, *"The vast stretches of forests are something the village is particularly proud of."* (S1, S2, S5,) Some of interviewees also mentioned about water resources, for instance, *"And it's not just the woods; the gentle streams weaving through the edges of these forests give the village an added touch of natural beauty. It's easy to see why many view it as a perfect spot for ecotourism."* (S8, S9, S16)

- **Cultural heritage**

When you talk to folks about Nanbeng Village, one thing becomes crystal clear: people are immensely proud of their vibrant ethnic minority culture. Through the interview, it can be found that nestled right on the border and known as a meeting ground for various ethnic groups, the village has become a melting pot of diverse traditions and stories. The majority of participants (90%) emphasized pride in the vibrant ethnic minority culture. For example, *"it's not just a trip - it's a journey into an authentic ethnic minority cultural."* (S15, S17) However, a minority (10%; 2 out of 20) expressed concern about the potential commercialization and dilution of local traditions due to increased tourism. For instance, one local resident mentioned, *"We are*

happy tourists appreciate our culture, but sometimes it feels like our traditions become simplified just to attract more visitors" (S11).

- **Current tourism practices**

The interview showed that tourism isn't the main breadwinner for the village, but it's definitely growing its share. Most locals see it as a nice addition to their regular earnings. But some village officials are buzzing about the promising rise in ecotourism. For example, *"they're keen to share that it's putting more money in local resident's pockets, but they're also the first to admit they're still getting the hang of it. There's excitement, but also a shared feeling that there's a lot more they could do to boost ecotourism."* (S1, S4)

- **Stakeholder perspectives**

The word on the street, especially from travel agency folks, is pretty hopeful. For example, *"they're genuinely impressed with how Nanbeng Village is shaping up as a tourist spot. The allure? It's the winning combo of nature's charm and rich culture."* (S5, S6, S7) Many believe that with the right push and polish, Nanbeng could be the next big thing in rural tourism.

The experience of sustainable ecotourism

The succinct overview of the sustainable ecotourism experience in Nanbeng Village may be derived from interviews performed, with a specific focus on the following aspects:

- **Ecotourism development strategies**

A great deal of importance was placed on the ecotourism strategy called "original" in the surrounding area of Nanbeng, apparently by a significant proportion of attendees. For example, *"the key to attracting tourists to our village lies in its 100% preservation of the most original ecological mode. Visitors can experience authentic ethnic minority customs here, and at the same time, the consumption level here is not high, suitable for almost all age groups of tourists."* (S2, S9, S12) In addition, the regular holding of village meetings helps to align the village's vision with sustainable principles. For example, *"when we have questions about the development of ecotourism, we often communicate with relevant leaders during village meetings."* (S3, S10, S14) Nevertheless, 10% (2 respondents) voiced concerns regarding the effectiveness of these meetings, noting that they sometimes failed to produce tangible results: *"We meet often, but sometimes these discussions don't lead to clear actions or decisions"* (S13).

- **Conservation initiatives**

One recurring theme in the interview was the village's respect for the natural environment. For example, *"some respondents talked about community led forest clearing operations, tree planting activities, and wildlife conservation plans."* (S2, S3, S11, S12) At the same time, Nanbeng Village actively establishes a "water source protection zone" to minimize human interference and ensure that the habitat remains pristine and undisturbed. However, a minority of participants (15%; 3 out of 20) highlighted challenges like insufficient funding and limited long-term planning: *"Our intentions are good, but without consistent financial support and proper long-term strategies, our conservation efforts might fall short"* (S7).

- **Economic strategies**

Diversification is the most frequently mentioned method by respondents when discussing the ecological tourism economy in Nanbeng. The village has successfully combined traditional agriculture with ecotourism related enterprises, ensuring multiple sources of income for local people. For example, *"some respondents emphasized that the village values training programs to provide locals with skills to enter the ecotourism market, from tour guides to making handicraft souvenirs."* (S1, S2, S5, S6)

- **Policy and planning**

Nanbeng Village attaches great importance to policies and planning for the development of ecotourism. On the one hand, the local government has worked together with external experts to create policies that give importance to sustainability. On the other hand, individuals are also starting to recognize the possible downsides of excessive tourism. Therefore, for instance, *"some respondents mentioned the policy of limiting the number of tourists during peak seasons to ensure that the ecology and culture of the village are not overwhelmed."* (S1, S2, S3, S4) Nonetheless, a critical minority (20%; 4 respondents) argued that policy enforcement lacked rigor and consistency: *"We have excellent policies on paper, but implementation and enforcement are often inconsistent"* (S4, S10).

The strategy for sustainable ecotourism

A concise summary of Nanbeng Village's strategy for sustainable ecotourism may be gleaned from interviews, with a focus on the following elements in particular:

- **Sustainable ecotourism experiences**

Entering Nanbeng, it is obvious that this village is not just a destination, but an experience. For example, *"the locals shared touching stories of travelers immersing themselves in the daily*

rhythm of the village, whether it's participating in traditional dances, tasting homely cuisine, or attending ancient agricultural ceremonies." (S18, S19, S20) These are not just carefully planned experiences, but real moments of life heading Nanbeng, welcoming visitors to make their journey both authentic and sustainable.

- **Environmental impact**

The lush mountains and rivers and primitive streams running Nanbeng are not only the background, but also the lifeblood of the community. For example, *"respondents often express their deep-seated admiration for nature. This sentiment is translated into feasible measures, from community led afforestation to strict waste management agreements, to ensure minimal ecological footprint."* (S10, S13) The village consciously strives to reduce its carbon footprint, showcasing its proactive environmental management methods, whether through promoting local agricultural products or encouraging sustainable modes of transportation such as cycling. However, 10% (2 local residents) critiqued the insufficient public awareness and participation in waste reduction programs: *"We have waste management strategies, but community involvement needs significant improvement"* (S9).

- **Economic impact**

At the intersection of tradition and modernity, the ecological tourism industry in Nanbeng has sparked economic revival. The locals talked about untapped potential that is now being utilized, for example, *"artisans searching for new markets for their crafts, farmers hosting experiences from farms to dining tables, and young entrepreneurs establishing environmentally friendly homestays."* (S8, S9) Although the influx of tourists undoubtedly brought prosperity, the focus of the community remains on fair wealth distribution and ensuring that economic benefits permeate every household. There are 4 respondents (20%) warned about unequal economic benefits, noting disparities between villagers directly involved in tourism and those who were not: *"While some benefit significantly, others see little change, potentially increasing inequality in the village"* (S12, S14).

- **Cultural preservation**

In every conversation, one can feel the rhythm of the heart of Nanpeng culture. As this village opens its doors to the world, people consciously strive to ensure that their cultural tapestry is not diluted. Cultural protection is the most important aspect, for example, *"from establishing a local museum to showcase its heritage, to organizing seminars to educate tourists about the village's folklore, traditions, and crafts."* (S1, S12, S17, S18) Elderly people in the community

particularly emphasize their role as cultural guardians, passing on stories, songs, and skills to the younger generation to ensure the perpetuation of their rich heritage.

DISCUSSION

The present study aimed to investigate the utilization of a sustainable strategy to destination management in order to foster the development of innovative ecotourism experiences in Nanbeng Village, located in China. This discourse is centered on the findings of the present study in order to address the three research inquiries.

RQ 1 What are the existing ecotourism practices in Nanbeng Village, and how have they impacted the local environment and community?

Ecotourism in Nanbeng Village and its consequences on the local ecology and people were the study's main focus. When considered on the basis of the relevant literature, the results highlight several debate topics.

Ecotourism in Nanbeng Village leverages abundant forest resources and interconnecting streams to attract ecotourists, aligning with the perspective that natural areas must be protected and sustainably managed (Lee & Jan, 2017). The village's rich cultural diversity also significantly enhances its ecotourism appeal, providing authentic ethnic minority experiences. Although tourism currently contributes modestly to the village's income, stakeholders recognize its growing economic importance and the need for structured development (Siregar et al., 2022). Stakeholders remain optimistic about ecotourism's potential to sustainably uplift the local economy and environment (Khan et al., 2020). However, the findings underscore the necessity for addressing potential challenges such as infrastructure development and effective stakeholder training to realize this potential fully.

Due to its abundant natural resources and rich cultural variety, Nanbeng Village is in the forefront of ecotourism for complete development. Ecotourism benefits the ecology and local populations, according to literature. This matches Nanbeng's practices and stakeholders' perceptions, and it shows the village's ecotourism-driven growth. To preserve and enjoy its natural and cultural resources, the town must be adaptable and open to new ideas.

RQ 2 What are the potential innovative ecotourism experiences that can be developed in Nanbeng Village, emphasizing sustainability, immersion, and education?

In addressing the research question, the findings from Nanbeng Village and the broader literature can be synthesized as follows:

Nanbeng Village emphasizes authenticity, actively preserving traditional cultural practices. Stakeholders prioritize maintaining the village's "original" ecological state, countering

potential issues of commercialization identified by Dunets et al. (2019). Conservation initiatives, including forest management and water source protection, could become immersive learning experiences, aligning with Tisdell and Wilson (2005) advocacy for environmental education. Economically, integrating traditional agriculture with ecotourism diversifies income sources and ensures authentic tourist experiences, echoing sustainable tourism practices outlined by Cater and Cater (2007).

The village's proactive management of tourism flows through effective policy planning, including peak season tourist limits, addresses common tourism challenges identified by Che (2002) and Butarbutar and Soemarno (2013). Given Nanbeng Village's position in a border region, there exists potential for innovative cross-border ecotourism experiences. Drawing insights from the literature, such collaborations could lead to the development of unique cross-border tourism products, combining the natural and cultural potential of multiple regions (Nestoroska, 2022; Prokkola, 2010). Yet, enhancing the consistency and effectiveness of policy implementation and stakeholder cooperation remains essential for sustainable success.

RQ 3 How can the proposed sustainable ecotourism strategies contribute to the economic upliftment of Nanbeng Village while ensuring the conservation of its natural and cultural resources?

The linchpin of sustainable ecotourism lies in striking a delicate balance between economic development and the conservation of natural and cultural resources. The unfolding story of Nanbeng Village exemplifies the power of locally driven, sustainable ecotourism strategies in achieving this equilibrium.

Nanbeng Village exemplifies the balance between economic development and conservation through sustainable ecotourism. The authentic tourism experiences provided, such as participation in local traditions and cuisines, align with Beaumont (2011) innovative marketing principles, enhancing tourist appreciation for sustainability. Proactive environmental strategies, including afforestation and waste management, significantly reduce ecological impacts, meeting sustainability criteria (Beaumont, 2011). Economic rejuvenation is evident through diversified local incomes and equitable wealth distribution, reflecting community-based ecotourism models advocated by Nugeraha et al. (2022). The village's cultural preservation efforts—museums, educational seminars, and elder-led cultural transmission—reflect community engagement priorities (Moswete et al., 2020). Stakeholder involvement has been integral, highlighting the need for authentic participation and empowerment in successful ecotourism development (Lalicic & Weber-Sabil, 2022; Salman, Jaafar, & Mohamad, 2021; Wang et al., 2021). Nonetheless, addressing operational challenges, such as stakeholder

engagement consistency and institutional limitations, remains critical for enduring success (Kenawy et al., 2017)

In summation, Nanbeng Village's sustainable ecotourism strategies, deeply rooted in community engagement and environmental conservation, offer a promising blueprint for other regions. By intertwining tradition with modernity, economic development with conservation, and ensuring genuine stakeholder engagement, the village not only addresses its unique challenges but also contributes to the broader discourse on sustainable ecotourism. Collaborate with results and discussion, a potential model for sustainable tourism development that can be adopted by similar communities worldwide was proposed.

Potential Model for Sustainable Tourism Development

This model emphasizes authenticity, conservation, community engagement, and stakeholder collaboration, reflecting both theoretical foundations and practical considerations identified in this research (Figure 3).

1. Foundation of the Model: Authenticity, Conservation, and Community Engagement

(1) Authenticity:

- Cultural Heritage: Integrate genuine local customs, narratives, and traditions into tourism activities, protecting cultural authenticity from commercialization.
- Local Experiences: Encourage visitor participation in daily community life, such as traditional dances, cooking, and farming, fostering deeper cultural connections.

(2) Conservation:

- Environmental Stewardship: Promote community-driven conservation projects like forest management, tree planting, and water source protection, offering tourists interactive experiences.
- Sustainable Practices: Implement eco-friendly initiatives including sustainable transportation, waste management, and local agricultural use to reduce environmental impacts.

(3) Community Engagement:

- Economic Inclusivity: Blend traditional agriculture and ecotourism, providing training in tourism-related skills like guiding and handicraft production to diversify local incomes.

- Stakeholder Collaboration: Foster cooperation between local communities, government entities, and experts through regular community meetings, ensuring aligned and sustainable ecotourism development.

2. Key Elements of the Model

(1) Cultural Preservation:

- Establish local museums and cultural centers to exhibit heritage.
- Conduct educational seminars about folklore and traditions, involving elders in cultural education.

(2) Environmental Conservation:

- Develop conservation projects and protected ecological zones, encouraging tourist participation through activities like guided nature walks and wildlife tours.

(3) Economic Development:

- Support eco-friendly homestays and artisan markets, ensuring equitable distribution of tourism-generated revenues.

(4) Policy and Planning:

- Collaborate with policymakers and specialists to create sustainable tourism guidelines.
- Manage visitor numbers during peak seasons to minimize environmental impact.

3. Operationalizing the Model

(1) Capacity Building:

- Provide training for residents in hospitality, guiding, and sustainable tourism practices.
- Develop curricula focused on environmental stewardship and cultural appreciation for youth.

(2) Marketing and Communication:

- Utilize targeted marketing highlighting authenticity and ecological responsibility, leveraging digital platforms to engage broader audiences.

(3) Monitoring and Evaluation:

- Establish metrics to assess tourism impacts, regularly adjusting strategies based on feedback and research.

4. Global Adoption Potential

(1) Adaptability:

- Easily tailored to diverse global communities with rich cultural and natural resources.

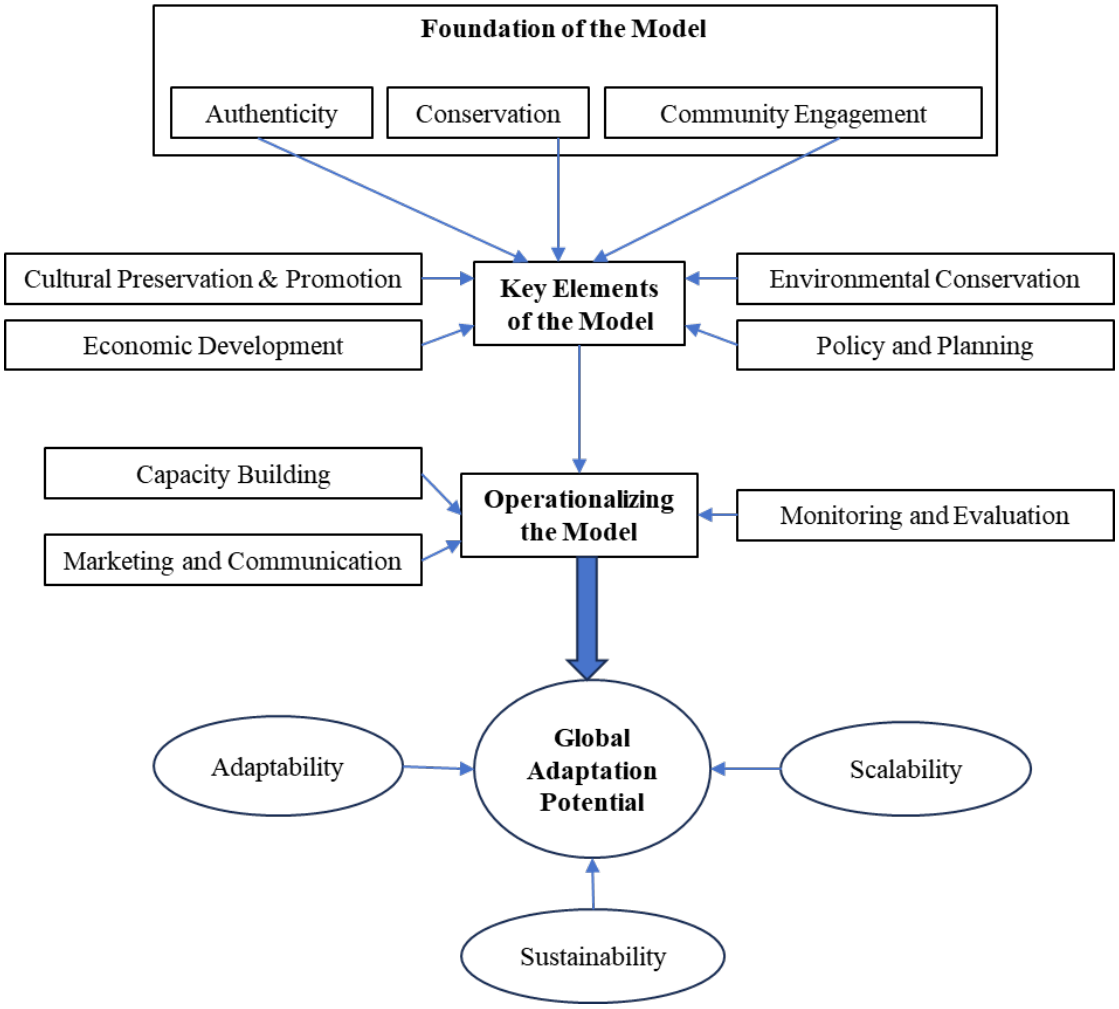
(2) Scalability:

- Begin with small pilots and expand based on effectiveness, encouraging cross-regional collaborations.

(3) Sustainability:

- Ensure longevity by centering conservation and cultural preservation within tourism development, engaging diverse stakeholders for robust and sustainable outcomes.

Figure 3 Potential Model for Sustainable Tourism Development



Global Adoption Potential

The proposed sustainable ecotourism model demonstrates substantial global adaptability, primarily due to its integration of universal sustainability principles and flexible implementation strategies. Empirical evidence from Nanbeng Village illustrates how authentic cultural experiences, rigorous environmental stewardship, diversified economic strategies, and proactive stakeholder engagement collectively promote balanced, sustainable development. This aligns theoretically with Xu et al. (2023) and Pavlidis et al. (2022), who underscore the universality of sustainability principles applicable across diverse geographical and cultural contexts. Additionally, the success of similar strategies in border regions and protected areas globally, as documented by Navrátil et al. (2015), Prokkola (2010), and Sobhani et al. (2023), provides empirical validation for the model's broader applicability. For instance, collaborative conservation projects and culturally immersive tourism products have proven effective across different socio-cultural environments, suggesting that the principles applied successfully in Nanbeng Village can be tailored to comparable communities worldwide. Moreover, as highlighted by Mingjing (2024), addressing local community dynamics through careful stakeholder management enhances the adaptability and success rate of ecotourism initiatives across diverse regions. Therefore, by grounding this model in universally applicable sustainability frameworks and empirical evidence from varied international contexts, this research substantiates its practical relevance and adaptability to global communities seeking sustainable tourism development solutions.

CONCLUSION

Nanbeng Village stands as a testament to the transformative power of sustainable destination management through the lens of creative ecotourism. By weaving together authentic local experiences with a profound commitment to ecological conservation, the village has pioneered a model that encapsulates both economic rejuvenation and preservation of its unique cultural and natural tapestry. Drawing inspiration from modern strategies, such as market segmentation, community-based ecotourism models, and sustainability criteria, Nanbeng showcases how destinations can thrive without compromising their core values. Stakeholder engagement remains at the heart of Nanbeng's success, ensuring an alignment of interests and fostering a genuine sense of communal ownership. Through this harmonized approach, Nanbeng Village offers a compelling blueprint for other destinations aspiring to merge creativity with sustainability in ecotourism, effectively illustrating that economic progress and preservation are

not mutually exclusive but can coexist symbiotically in the realm of modern tourism management.

Limitations of the Study

This investigation, while providing insightful findings, is not without its limitations. One potential limitation is that the study may have overlooked some viewpoints within Nanbeng Village and its stakeholders due to its dependence on qualitative approaches. Certain of these methods were outdoor observations as well as discussions with 20 people that were only informally structured. The scope of participants, although diverse, may not fully represent the broader community's views or the variety of tourists visiting the area. Furthermore, the exclusive emphasis on Nanbeng Village, a distinctive location with notable cultural and environmental characteristics, would restrict the applicability of the results to different settings or areas. The study's timeframe limits the evaluation of the long-term effects of ecotourism methods on economic growth and resource protection.

Implications

For Nanbeng Village: The findings underscore the importance of community engagement and the development of ecotourism experiences that align with local values and conservation goals. Implementing the study's recommendations could enhance Nanbeng's position as a leader in sustainable ecotourism, fostering economic growth while safeguarding its environmental and cultural assets.

For China: This study contributes to the broader discourse on sustainable tourism in China, offering a case study that can inform national policy and planning. This statement highlights the ability of rural communities to utilize their natural and cultural resources to promote economic advancement, aligning with China's goals of rejuvenating rural regions and encouraging sustainable development.

For Global Society: The research provides a model of sustainable ecotourism that can be adapted by similar communities worldwide. It reinforces the notion that sustainable practices are crucial for the long-term viability of tourism destinations, offering insights into balancing economic development with conservation efforts. The study advocates for increased global cooperation in sharing best practices and resources to support sustainable tourism in rural and border regions.

Future Study Directions

Future research should consider expanding the methodological approach to include quantitative data, offering a more comprehensive understanding of ecotourism impacts. Research attempts ought to investigate a more extensive and diversified group of individuals involved in sustainable tourism, such as overseas visitors, in order to obtain more comprehensive understandings of worldwide perspectives on sustainable tourism practices. Comparative studies with other villages or regions employing different ecotourism strategies would provide valuable benchmarks and lessons. In addition, in order to ascertain the financial and lasting sustainability of ecotourism projects, longitudinal studies are crucial. Additionally, research focusing on the integration of digital technologies in promoting and managing ecotourism experiences could offer innovative pathways for sustainable tourism development. To get substantial insights into the variables that either encourage or inhibit the efficacy of these activities, it would be useful to research the impact of policies and government subsidies on the development of sustainable ecotourism practices.

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Original scientific paper

REGIONAL AND SECTORAL DIFFERENCES BETWEEN FAMILY BUSINESS UNITS IN THE CZECH REPUBLIC

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Abstract

The article's topic is to identify the character of family business units in the Czech Republic from the point of view of their sectoral and regional representation at the level of NUTS region 2. The paper aims to assess the significance of individual factors influencing financial characteristics of defined groups of family businesses based in the Czech Republic, categorised by region and sector. On a selected sample of family businesses, we examined their mutual differences based on data from their financial statements from 2020 to 2022 in the Albertina database. We surveyed almost 500 family businesses in the Czech Republic that provided data to this database in all three years.

We identified family companies according to the region of the company's headquarters in the Czech Republic and according to the size of the company. The monitored signs are as follows: debt ratio, return on equity (ROE), and personnel cost to total costs. The results confirmed some regional and sectoral differences. Family businesses in the register of family business in the Czech Republic are micro-enterprises, small and medium-sized enterprises. Large businesses are not on the register. The highest representation is in the processing industry, mainly metal processing. These monitored indicators showed differences in family businesses between regions and sectors of their operation. The largest number of family businesses is in the South Moravian Region and the capital city of Prague. We registered no less family businesses in the Karlovy Vary Region and the Ústí Region (Northwest Bohemia). The statistical significance of the results was tested. The approach of family firms to debt financing is crucial here, as most firms are relatively risk-averse and mainly use their capital for financing.

Keywords: Accounting, Corporate Finance, Czech Republic, CZ NACE, Family business, NUTS 2 Region

INTRODUCTION

Family businesses comprise approximately 60% of all businesses in the European Union. In the Czech Republic, they are also an essential part of the economy. The Czech Republic does not have accurate statistical records of family businesses, and the definition of a family business in

the Czech Republic follows the European Union definition. The Ministry of Industry and Trade of the Czech Republic uses a database of family businesses (ASME, 2020). Registration is voluntary for family businesses, confirming that registered businesses meet the definition of a family business corporation. Our study uses the above-mentioned databases and connects them with the companies' financial statements from the Albertina database. On a selected sample of family businesses, we examined their mutual differences between regions and CZ NACE sectors based on data from their financial statements from 2020 to 2022.

THEORETICAL BACKGROUND

The family business has long been considered by scholars to be a fundamental element in any world economy. Historically, family businesses are the oldest form of business and have an irreplaceable position in every economy (Kubíček, 2016). In most countries, they represent more than half of all companies and more than half of the total output of their economy. In several countries, they have the status of the largest employer, as in Germany (Urban, 2020). This subject has been explored by scholars from a variety of geographical locations (mostly from the United States, Canada, Sweden, and Western European countries). Here, family businesses have a long-standing tradition and the possibility of many years of development. For example, Rovelli et al. (2022) summarise 32 years of research on family firms. The situation in the Czech Republic is distinct. The evolution of family firms has been an ongoing phenomenon in this region for the past three decades, after the transition to a market economy in late 1989. Family firms have, to date, completed a relatively brief period of experience. The initial owners transferred ownership of their family businesses to their descendants on a gradual basis. Nevertheless, some businesses in the Czech Republic survived and are still operating today, as is the case with the Baťa and Koh-i-noor brands.

Family firms are found in all sectors of the world economy and significantly influence the development of employment, the amount of value added created, investment, and capital formation (Allouche, Amann, Jaussaud & Kurashina, 2008). A study by Price Waterhouse Coopers (PwC, 2014) estimates that family businesses produce 70-90% of the world's gross domestic product (GDP) annually. They simultaneously create 50-80% of jobs in most countries worldwide. One-third of the 250 largest family businesses in the world are located in Europe. A complete 85% of European companies are family businesses, which generate 70% of European GDP and employ up to 60% of the European workforce (Kubíček, 2016).

According to European Family Businesses (2024), family businesses comprise 65-80% of all European companies, representing more than 40-50% of all jobs on average. Their importance lies not only in the fact that they contribute in a fundamental way to the development of the economy, but they are also crucial for their long-term stability, the specific commitment and responsibility they feel as owners, and the values they espouse.

In the Czech Republic as well, family businesses rank among the important pillars of the national economy. The Association of Small and Medium Enterprises and Entrepreneurs of the Czech Republic considers family businesses to be the basis of a stable domestic economy, as it is family businesses that are the largest source of jobs in the private sector (MTI, 2021). They are an important and irreplaceable element of regional development, as Kocmanová (2021) adds.

Although family businesses tend to be small and medium-sized businesses, there are also large family-owned businesses operating globally that have been family-owned for many generations (Urban, 2020). There are more than 23 million small and medium-sized enterprises in the European Union (EU), which account for 99% of all businesses and two out of three jobs in the private sector. Small and medium-sized enterprises are the engine of the economy (EUR-Lex, 2021). In the Czech Republic, family business is especially in the hands of small and medium-sized enterprises. These enterprises play an essential role in developing the potential of individual regions.

Family businesses are connected to the region in which they operate, and significantly so. They create the entrepreneurial backbone of each region and are the basis of the regions' infrastructure (Petrů, & Havlíček, 2016).

According to Petlina and Koráb (2015), the research in the area of small and medium-sized family businesses resulted in the conclusions that family business in the scope of small and medium-sized enterprises is the engine of the Czech economy, has real potential for its development and is able to increase the competitiveness of the country on the world market.

Financial aspect of family businesses

A relatively large number of authors focus on the succession of the family business to the next generation or on the specifics of family business management. At the same time, far fewer publications cover the evaluation of family businesses in terms of business finance. A recurrent subject in the literature is the question of the tendency of family businesses to favour certain funding sources over others.

In the literature, there are possible to find two partial contractionary views on the relative use of debt by family companies with comparison to other types The first one highlights the risk aversion of family firms due to their owner's low wealth diversification and argues that family firms avoid debt because of the accompanying increased bankruptcy risk (Mishra, & McGonaughy, 1999; Anderson, & Reeb, 2003). The second perspective, represented by Croci, Doukas and Gonenc (2011), argues that family companies prefer debt as a nondiluting financial strategy over raising new capital for company development, which does not affect the ownership structure. Owners of family businesses place greater emphasis on the financial security of the family in the long term than other companies. Prudence and a conservative approach mean that the financial health of family businesses tends to be very good, and the vast majority of family business owners plan to pass their business on to the next generation. Research and analysis by the Association of Small and Medium Enterprises and Entrepreneurs of the Czech Republic (ASME CR, n.d.) also confirms this. The author Szymanska (2015) adds to this issue that she noticed a smaller number of declines, but also erroneous financial decisions, in family businesses than in other entities. Martínez, Requejo (2017) studied the relationship between ownership concentration and firm value. The authors concluded that family control positively affects the performance of the family firm if family members are still influential. Hansen and Block (2020) also confirmed the risk-aversion of family businesses due to their lower debt ratio.

Pindado, Requejo and De La Torre (2015) examined the relationship between family control and capital structure. The authors focused on how family control shapes the capital structure of family firms. The authors' results point to the fact that the sensitivity of debt to cash flow fluctuations and the speed of adjustment of family firms depend on the ownership structure and management style. The authors state that in the case of the presence of a second owner in family firms, the risk of collusion may arise, which limits the acquisition of new external funds. Gallucci, Santulli, De Rosa (2017) on 448 articles examined how family business literature and financial issues interact. The authors found they could not apply classical financial theory to family firms. At the same time, the research results revealed that socio-emotional wealth could contribute to determining a new perspective in which to examine the interplay between family and business.

Michiels (2023) also confirms the fact that we cannot apply classic financial theories to family businesses. The author states that conventional financial theory in the family firms lags and requires a deeper and more detailed understanding of how family dynamics intertwine with financial decision-making. Family businesses differ from the classic corporate finance models

in that they typically have a concentrated ownership structure. Michiels, Molly (2017) also looked at financial decision-making in family firms. These authors state that the reviewed literature (131 evaluated articles on family business financing decisions) demonstrates non-traditional approaches to family business financing decisions. These theories highlight the importance of maintaining control, risk aversion, non-financial goals and values in owners' financial decision-making. These factors then lead to a preference for internal sources of financing over external sources. Expert studies describe considerable differences in the ownership structure of family firms. Acedo-Ramirez et al. (2017) also confirm that many different factors influence the resulting capital structure of family firms. The variables may even differ among the family firms due to differences in size, stage of the life cycle, gender of the chief, generation to which they belong, and other factors.

In one of the chapters of his book, Zellweger (2017) also deals with the capital structure of family firms. It focuses more closely on the concentration of family capital as a separate asset class, it focuses on the advantages and disadvantages of financing with own and foreign capital (debt) and the associated costs of own capital and debt.

The authors Alphy and Ranajee (2024) compiled a comprehensive overview of 192 peer-reviewed journal publications between 2000 and 2023. In the study, the authors included only those publications that addressed the relationship between family businesses and their capital structure as the main research question. Subsequently, they categorized the conclusions from the articles into six main themes, which are (i) family business performance and strategy, (ii) ownership and management structure, (iii) succession and leadership, (iv) variety of knowledge and resources, (v) social and emotional factors and (vi) gender and cultural factors. These six main subthemes explain the shaping or control of family businesses' capital structure choices or their financing decisions. At the same time, the authors state that classic financial theories have limited applicability in the case of family firms. The study by Hansen and Block (2020) mentioned the regional differences caused by different effects of legislative regulations and conditions in the regions themselves. Many factors influence the capital structure of family businesses. The authors mention the following factors: social aspects, cultural aspects, regional aspects, and we must not forget the family aspects.

The literature is often focused on comparing differences between family business and non-family business units in different sectors: the agriculture sector (e.g. Williams & Scott, 2024), the tourism sector (Camison, Forés, & Puiq-Denia, 2016) or manufacturing industries (Erbetta, Menozzi, Corbetta, & Fraquelli, 2013). Differences within groups of family firms are rarely addressed, and this issue is seldom dealt with at the Czech level. Furthermore, research focusing

on Czech family businesses only marginally addresses their financial characteristics, treating them as an additional topic alongside those focusing on transmission to the next generation, or from managerial or sociological perspectives. Based on these findings, we have chosen to focus this paper on geographical and sectoral differences between groups of family businesses in the Czech Republic in terms of their financial characteristics.

The main aim of this article

Based on these studies and our investigation, we made the following assumptions:

- Family businesses are characterised by higher use of their own capital and a lower level of debt financing. This is why the return on equity (ROE) is chosen as a profitability measure instead of return on assets (ROA). The debt ratio indicator accompanies the ROE indicator in our research. The combination of these indicators guarantees the higher validity of the results.
- Another specific indicator for family business units is retained earnings. This indicator correlates highly with values of other measures used, so we refer to it only in deeper analysis (cluster analysis and centroids).
- Small and medium-sized enterprises (SMEs) are typical representatives of family firms, and the composition of our sample corresponds to this. Our data sample does not include big companies at all. Due to the location of the headquarters of the SMEs often also in small towns or villages, we can assume them as important employers in regions. In our research, this aspect of family business is represented by the personal cost indicator.

Based on these assumptions, the main aim of the paper was defined:

The main aim of the paper is to assess the significance of individual factors influencing financial characteristics (ROE, debt ratio, and personnel cost) of defined groups of family businesses based in the Czech Republic, categorised by region and sector.

DATA AND METHODS

In this part of the paper, the main goal is defined and elaborated into the individual sub-objectives, the analyzed sample is described, and all used methods are stated.

1. Sample description

The sample includes companies that were interested in database of the Association of Small and Medium Enterprises of the Czech Republic and the Association approved their registration.

Therefore. we consider it proven as family businesses. There were 1.224 records in the family business database on the date of obtaining the financial data. We obtained data from the financial statements for the year 2022 from 475 companies (Albertina Gold Edition Database). Our sample therefore corresponds to almost 39% of the total number of records. We have two types of companies in our sample. Limited liability companies significantly predominate with 447 representants and their share in the data set is 94.1%. Joint-stock companies participate in the sample 5.9 %.

Number of family companies in the regions of the Czech Republic

We identified family companies in all 8 regions at the NUTS 2 level and all 14 regions at the NUTS 3 level in the Czech Republic (the counts you can see in Tab.1).

Table 1 Number of subjects in these NUTS 2 and NUTS 3 Regions

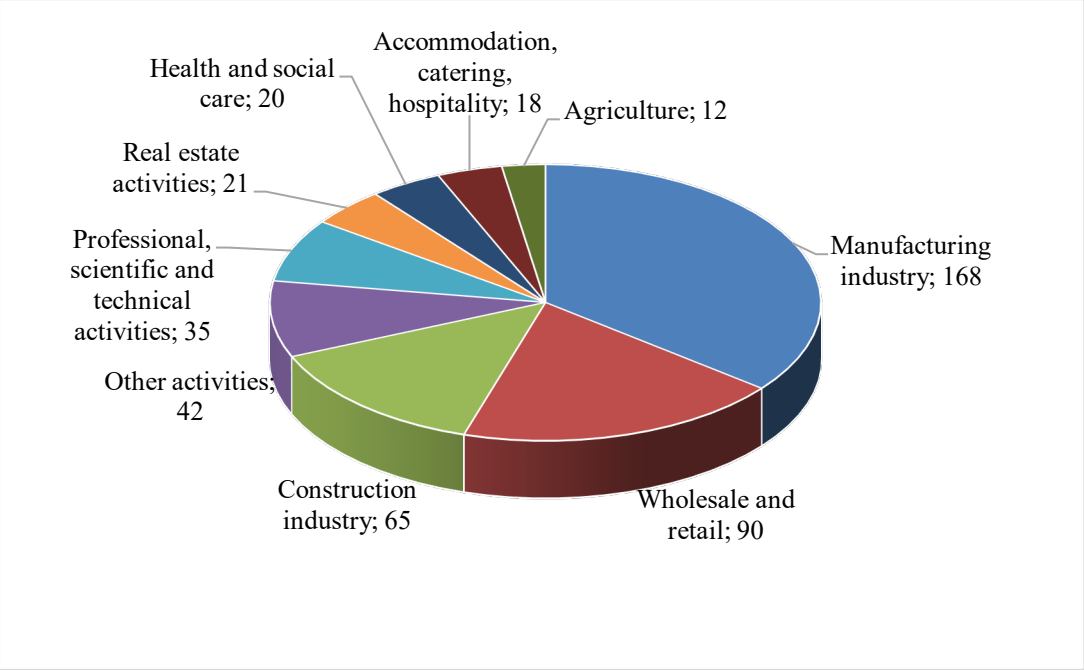
Region NUTS 2	**Region NUTS 3**	**Number of subjects in the NUTS 3 Region**
Capital City of Prague (CZ01)	Capital City of Prague	69
Central Bohemia (CZ02)	Central Bohemian Region	43
Southwest Bohemia (CZ03, 60 family companies)	South Bohemian Region	32
	Plzeň Region	28
Northwest Bohemia (CZ04, 17 family companies,)	Karlovy Vary Region	4
	Ústí Region	13
Northeast Bohemia (CZ05, 78 family companies)	Liberec Region	14
	Hradec Králové Region	25
	Pardubice Region	39
Southeast Bohemia (CZ06, 99 family companies)	Vysočina Region	26
	South Moravian Region	73
Central Moravia (CZ07, 64 family companies)	Olomouc Region	27
	Zlín Region	37
Moravian Silesia (CZ08)	Moravian-Silesian Region	41
Total number of companies		**471**

Source: Albertina Gold Edition Database

Representation of individual sectors of the national economy in the sample

We classified family companies according to the sector of their main activity. We have divided the industry into these groups to meet our needs. The following Fig. 1 shows the structure of the industries represented in our sample.

Figure 1 Structure of the sample – sectors of the economy



Note: Sector name; number of companies
Source: Albertina Database

2. Main objective

The main objective of the paper is to assess the significance of individual factors influencing financial characteristics (ROE, debt ratio, and personnel cost) of defined groups of family businesses based in the Czech Republic, categorised by region and sector.

The main aim will be fulfilled through two partial objectives:

Partial objective 1: To identify whether there are differences (described by ROE, debt ratio, and personal cost) between groups of the family businesses representing different sectors of the national economy.

Partial objective 2: To find out whether there are differences between groups of the family businesses representing the regions of the Czech Republic (described by ROE, debt ratio, and personal costs).

Individual hypotheses prepared for statistical data evaluation:

A1. The data sample evaluation is separated for ROE, debt ratio, and personal costs ratio:

1. The differences among the nine production sectors of family firms in ROE/ debt ratio/ personnel costs:

H0 – There are no statistically significant differences among production sectors (on the CZ NACE level) in ROE/debt ratio/ personnel costs.

HA – There are significant differences between production sectors in ROE/debt ratio/ personnel costs.

A2. Similar hypotheses were constructed for differences among the tested groups of the family business units based on the regions.

B. The evaluation based on all three indicators is performed by using the cluster analysis methods:

1. The verification of differences among the three defined clusters based on all used indicators (ROE/debt ratio/ personnel costs):

H0 – There are no statistically significant differences between constructed clusters.

HA – There are significant differences between constructed clusters.

3. The process of identifying variables

For the evaluation of the differences, the three ratios were chosen. All indicators are based on data obtained from the Albertina database. We initially identified 15 indicators, but we excluded them both due to missing or incorrect data, as well as due to high dependencies (verified by correlation analysis) and functional analysis. Finally, the identified measures are ROE, debt ratio, and personal costs.

Return on equity (ROE)

The measure return on equity (ROE) is defined as a ratio between earnings and equity and is a standardized measure of the ratio analysis. It measures how efficiently a company's management generates profit from its own capital. It is typical for family-owned firms to prefer equity financing to debt financing, and therefore, performance evaluation using this indicator is more appropriate. In our tables, ROE is stated as an index, but sometimes in comments, the percentage form is also used.

Debt ratio

Total liability divided by total assets (sometimes called the debt/asset ratio) shows the proportion of a company's assets that are financed through debt. If the ratio is less than 0.5, most of the company's assets are financed through equity. If the ratio is greater than 0.5, most of the company's assets are financed through debt.

Personal costs

This measure is calculated as a ratio of the personal costs to the total costs of the individual company.

4. The methods and evaluation of the results

Individual steps of the results evaluation are as follows:

a) The differences between sectors are evaluated separately for each of the three measures.
b) The differences between regions are evaluated separately for each of the three measures.
c) Cluster analysis as a method for evaluating the results as a whole.

Detailed procedure of the performed cluster analysis

Cases with missing values were removed from the data sample, 1,183 observations of business units from 2020 to 2022 remained.

The standardization was carried out: Standardization means that each column in the data frame is transformed to have a mean (mean) of 0 and a standard deviation of 1. This is done using the following formula for each element in the data frame:

$$Z = \frac{(z-\mu)}{\sigma} \qquad (1)$$

Where the z is the original value of the used measure. μ is the average value of the indicator, and σ is the standard deviation.

Standardization is a very important step in the data preparation phase. Many machine learning algorithms assume that all input variables have the same scale. For example. distance-based methods (such as k-means clustering or k-nearest neighbours) can be strongly affected by the range of variables.

The optimal number of clusters

The purpose of cluster analysis is to discover a system of organizing and placing business units into groups based on the correlation found among the evaluated measures. The optimal number of clusters to be used for the next clustering method was determined based on AHC methods (Agglomerative Hierarchical Clustering methods). Tab. 2 presents the results of several AHC methods. The methods clearly recommend using 3 groups (clusters) for the k-means clustering.

Table 2 Agglomerative Hierarchical Clustering – number of clusters

	Number of clusters according to the aggregation criterion		
Dissimilarity criterion	**Single linkage**	**Strong linkage**	**Wards method**
Euclidean distance	3	3	3
Chebyshev distance	2	2	2
Manhattan distance	3	3	4

Source: Own processing in STATISTICA 12

The AHC clustering, as well as the k-means clustering method, were processed in STATISTICA 12 software.

K-means method

The k-means method divides the observations into homogeneous clusters. based on their description by a set of quantitative measures. The k-means method is iterative. and the following parameters are entered in the STATISTICA 12 software: number of measures (3 measures mentioned before). The number of observations is 1183, and the number of clusters is 3 (based on the AHC results). The presented solution of the k-means clustering was gained after 3 iterations. The evaluated observations are divided into 3 clusters: 580 to cluster 1, 390 to cluster 2, and 215 to cluster 3.

5. Statistical evaluation of results

Due to the character of the dataset, the nonparametric statistical test of hypothesis is used.

The Kruskal-Wallis test is a non-parametric alternative to one-way (between-groups) ANOVA. It is used to compare three or more samples, and it tests the null hypothesis that the different samples in the comparison were drawn from the same distribution or from distributions with the same median. Thus, the interpretation of the Kruskal-Wallis test is basically similar to that of the parametric one-way ANOVA, except that it is based on ranks rather than means (Siegel & Castellan, 1988).

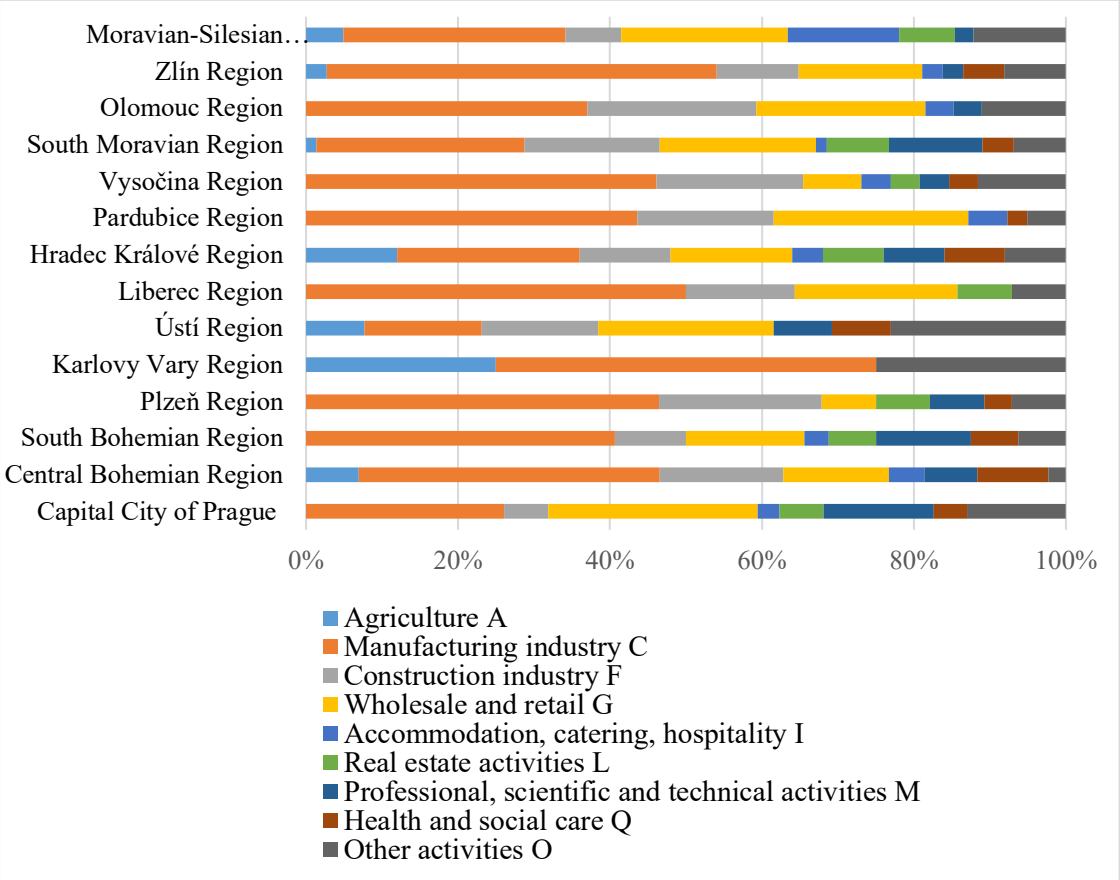
RESULTS AND DISCUSSION

One of the sub-goals is to sort the data of Albertina Database. In the first step, we organized the data in two ways: by region and by sectors. We used data from the period 2020 - 2022 from the Albertina database. The first part of the results describes a sample of family businesses from the Albertina database.

The second part deals with three financial indicators. The third parts deal with statistical significance of financial indicators. The cluster analysis of the sample of family businesses and the evaluation of individual clusters is in the fourth part. There is also a statistical evaluation of the differences between clusters.

We expected to find regional differences in the sectors and regions of the Czech Republic. Here is the result for our sample of 471 family companies in the Czech Republic. Regions correspond to the NUTS 3 level breakdown. We classified the sectors according to the CZ NACE classification. Manufacturing industry representation in the field of family businesses can be specific and unique in the Czech Republic. We selected industries that are significant for our sample or that we assumed would be significant.

Figure 2 Family companies by sector in the regions NUTS 3 of the Czech Republic



Source: Albertina Database

Fig. 2 shows that the regions do not differ significantly in the composition of sectors. We can say that the processing industry prevails in most regions. For example, agriculture is a small sector in our sample. The reason may be the fact that the Ministry of Industry and Trade registers family businesses, but the sector is not limited to this. We use this registry. Agricultural family farms register with the Association of Private Agriculture of the Czech Republic and

apparently do not need to register with the Ministry of Industry and Trade as well. Fig. 2 shows the differences in all sectors of family businesses in the register of the Ministry of Industry and Trade.

1 Separate evaluation of individual indicators in a sample of family companies

The aim of this section is to describe selected indicators for the entire sample of family companies. Cluster analysis uses these ratios in the next section. These are indicators:

- Debt Ratio,
- Return of equity (ROE),
- The personnel cost (calculated as a share to the total costs of the company).

Table 3 Indicators of the sample of family companies

The whole sample	Debt Ratio	ROE	Personnel costs
Arithmetic mean	0.5543	0.1542	0.1939
Standard deviation	0.2968	0.4433	0.1967
Min	0.0002	-4.4085	0
Max	1.8842	4.2594	0.9145
Median	0.5019	0.0116	0.1548

Source: Albertina Database, own processing

In the next step, we examined the differences of the mentioned indicators between the sectors in our sample of family companies. The Manufacturing Industry sector is the most important sector of family companies in our sample. We have separated the most important part of this sector, which includes metalworking, cutlery and machine manufacturing.

The highest debt ratio is reached based on its reports in the agricultural and wholesale and retail sectors, followed by the manufacturing industry. Interesting is that the metalworking sector reaches the 10 % lower value of the debt ratio. On the other hand, the lowest value of the debt ratio reaches the sector M (professional, scientific and technical activities) and the others.

Compared to that, the highest value of the ROE is reached in the accommodation industry, followed by the construction industry. The enormous value of the accommodation industry is affected by the very low total assets reported by the companies in this sector. We assume that they operate with rented assets, for example, buildings and facilities. As you can see in Tab. 4, this indicator has the highest standard deviation. The reason for this difference compared to other indicators is, among other things, the fact that the indicator is calculated from economic

results. In the event of a loss, the value is also negative, and the difference between the maximum and minimum value of the indicator will widen. The last indicator, personnel costs, has the lowest differences among sectors (see the standard deviation, which declares it).

Table 4 Indicators in selected sectors

Arithmetic mean of the sector	**Debt Ratio**	**ROE**	**Personnel costs**
Agriculture (A)	0.6873	0.2300	0.2564
Manufacturing Industry (C)	0.5351	0.1549	0.1833
• **Separately C - metalworking and engineering**	0.4365	0.1261	0.2295
Construction industry (F)	0.2803	0.6950	0.1879
Wholesale and retail (G)	0.5697	0.1824	0.2168
Accommodation. catering. hospitality (I)	0.3051	1.0140	0.1929
Real estate activities (L)	0.3035	0.2792	0.2078
Professional. scientific and technical activities (M)	0.0773	-0.2472	0
Others (O)	0.0154	-0.660	0

Source: Albertina Database, own processing

The results by NUTS 2 regions are depicted in Tab. 5. The region with the worst result in debt ratio is the CZ 08 region, which reaches the lowest one (CZ04 region) by more than 23%. When we compare the NUTS 2 region in ROE indicator, the two regions (CZ 07 and CZ 04 are almost equal, followed by CZ 08 (19, 38%). The ratio of personal costs to total costs is also relatively comparable between regions.

Table 5 Indicators by NUTS 2 regions

	Debt ratio	ROE	Personel cost
CZ01	0.5180	0.0962	0.1738
CZ02	0.5908	0.1633	0.2042
CZ03	0.5863	0.1422	0.2012
CZ04	0.4362	0.2121	0.2520
CZ05	0.5559	0.1613	0.1820
CZ06	0.5522	0.1250	0.1864
CZ07	0.5113	0.2112	0.2228
CZ08	0.6660	0.1938	0.1702

Source: Albertina Database, own processing

2 Testing of statistically significant differences of monitored indicators

This part focuses on statistically significant differences between CZ NACE sectors and regions of the Czech Republic in monitored financial indicators. The statistical significance of the differences indicates a real relationship between the selected indicators, and we can evaluate our results accordingly.

The groups of the family companies mentioned before are subjected to the statistical testing of mutual differences. Due to the characteristics of the dataset, the Kruskal-Wallis statistical test was used (for more details, see the methodology). Tab. 6 and Tab. 7 describe the p-values of the mutual pairs of the groups of the companies. The pairs with significant differences at the 0.05 significance level are marked in red.

2.1 Separate evaluation of individual indicators between the regions of the Czech Republic

A short summary of the significant differences in the debt ratio is here:

- There is a statistically significant difference in the debt ratio of family companies in the Vysočina and Moravian-Silesian regions compared to the other five regions (Capital City of Prague, Ústí Region, Karlovy Vary Region, South Moravian Region, Olomouc Region).
- Furthermore, the South Bohemian Region, the Ústí Region, and the Liberec Region differ significantly.

Summary of ROE results:

- Here we found balanced results. Pilsen and South Bohemia regions are significantly different from each other. This also applies to the South Bohemian Region compared to the Capital City of Prague.

Summary of personnel cost:

- In this case, we did not find a significant difference between family companies in the regions of the Czech Republic.

The varying results of companies in different regions of the Czech Republic are attributable to a combination of economic, structural, and regional factors. The main reasons for regional differences in debt ratio can be attributed to the different structure of the economy in individual regions. In industrial regions (e.g., the Moravian-Silesian region), enterprises often have a higher debt ratio due to capital-intensive industries compared to regions focused more on services (as Prague is often referred to). Another relevant factor is the size and type of enterprises in the regions – large enterprises generally have higher debt levels and are more likely to use debt financing. Furthermore, different regions are also described as having different access to finance for businesses, with Prague and Brno often cited as having better access to banking services and investors in general. Conversely, regions with a higher share of

SMEs have lower debt levels, as these smaller enterprises often rely on their own resources or on subsidies.

The differences between the regions are more noticeable after using NUTS 2 regions for the ROE and Personal costs from the total costs' indicators. The following Tab. 6 shows the statistically significant differences of the monitored indicators with respect to the regions NUTS 2. The intensification of differences when using larger regional units points to differences in geographic distribution between regions and their cooperation. If the companies from these regions are more connected, then these differences may deepen.

Differences in debt ratio had the opposite course - only CZ01 – Capital City of Prague and CZ05 – Northeast Bohemia Region were otherwise comparable everywhere.

Table 6: Statistical evaluation of pairs of NUTS 2 regions

Indicators / NUTS 2		CZ01	CZ02	CZ03	CZ04	CZ05	CZ06	CZ07	CZ08
Personnel Costs	CZ01		0.00000	0.00275	0.00000	0.00000	0.00000	0.00000	0.00000
	CZ02	0.00000		0.00017	0.56454	0.14340	0.00141	0.04565	1.00000
	CZ03	0.00275	0.00017		0.00000	0.73368	1.00000	1.00000	0.83529
	CZ04	0.00000	0.56454	0.00000		0.00018	0.00000	0.00006	0.00312
	CZ05	0.00000	0.14340	0.73368	0.00018		1.00000	1.00000	1.00000
	CZ06	0.00000	0.00141	1.00000	0.00000	1.00000		1.00000	1.00000
	CZ07	0.00000	0.04565	1.00000	0.00006	1.00000	1.00000		1.00000
	CZ08	0.00000	1.00000	0.83529	0.00312	1.00000	1.00000	1.00000	
ROE	CZ01		0.00007	1.00000	0.00097	0.00000	0.12374	0.22168	0.00015
	CZ02	0.00007		0.12118	1.00000	1.00000	0.25118	0.39043	1.00000
	CZ03	1.00000	0.12118		0.13973	0.02019	1.00000	1.00000	0.16055
	CZ04	0.00097	1.00000	0.13973		1.00000	0.27427	0.34583	1.00000
	CZ05	0.00000	1.00000	0.02019	1.00000		0.03461	0.08657	1.00000
	CZ06	0.12374	0.25118	1.00000	0.27427	0.03461		1.00000	0.33381
	CZ07	0.22168	0.39043	1.00000	0.34583	0.08657	1.00000		0.49174
	CZ08	0.00015	1.00000	0.16055	1.00000	1.00000	0.33381	0.49174	
Debt Ratio	CZ01		1.00000	0.67443	1.00000	0.04961	1.00000	1.00000	1.00000
	CZ02	1.00000		1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
	CZ03	0.67443	1.00000		1.00000	1.00000	0.90911	0.88468	1.00000
	CZ04	1.00000	1.00000	1.00000		0.48423	1.00000	1.00000	1.00000
	CZ05	0.04961	1.00000	1.00000	0.48423		0.05179	0.06751	1.00000
	CZ06	1.00000	1.00000	0.90911	1.00000	0.05179		1.00000	1.00000
	CZ07	1.00000	1.00000	0.88468	1.00000	0.06751	1.00000		1.00000
	CZ08	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	

Source: Albertina Database, own processing in software Statistica 12>

2.2 Statistically significant differences of monitored indicators between sectors

The following Tab. 7 shows statistically significant differences between CZ NACE sectors for each indicator separately. Statistically significant differences occur between manufacturing, construction, and wholesale and retail trade. This is true for all three indicators.

Table 7 Statistical evaluation of pairs of CZ NACE sectors (p-values)

Indicators /sectors		A	C	F	G	I	L	M	O	C - M
Personnel Costs	A		1.00000	0.54066	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
	C	1.00000		0.00032	1.00000	1.00000	1.00000	1.00000	0.24469	1.00000
	F	0.54066	0.00032		0.00003	1.00000	1.00000	1.00000	1.00000	0.00013
	G	1.00000	1.00000	0.00003		1.00000	1.00000	0.91373	0.02561	1.00000
	I	1.00000	1.00000	1.00000	1.00000		1.00000	1.00000	1.00000	1.00000
	L	1.00000	1.00000	1.00000	1.00000	1.00000		1.00000	1.00000	1.00000
	M	1.00000	1.00000	1.00000	0.91373	1.00000	1.00000		1.00000	0.93267
	O	1.00000	0.24469	1.00000	0.02561	1.00000	1.00000	1.00000		0.04126
	C-M	1.00000	1.00000	0.00013	1.00000	1.00000	1.00000	0.93267	0.04126	
ROE	A		1.00000	0.54066	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
	C	1.00000		0.00032	1.00000	1.00000	1.00000	1.00000	0.24469	1.00000
	F	0.54066	0.00032		0.00003	1.00000	1.00000	1.00000	1.00000	0.00013
	G	1.00000	1.00000	0.00003		1.00000	1.00000	0.91373	0.02561	1.00000
	I	1.00000	1.00000	1.00000	1.00000		1.00000	1.00000	1.00000	1.00000
	L	1.00000	1.00000	1.00000	1.00000	1.00000		1.00000	1.00000	1.00000
	M	1.00000	1.00000	1.00000	0.91373	1.00000	1.00000		1.00000	0.93267
	O	1.00000	0.24469	1.00000	0.02561	1.00000	1.00000	1.00000		0.04126
	C-M	1.00000	1.00000	0.00013	1.00000	1.00000	1.00000	0.93267	0.04126	
Debt Ratio	A		1.00000	0.54066	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
	C	1.00000		0.00032	1.00000	1.00000	1.00000	1.00000	0.24469	1.00000
	F	0.54066	0.00032		0.00003	1.00000	1.00000	1.00000	1.00000	0.00013
	G	1.00000	1.00000	0.00003		1.00000	1.00000	0.91373	0.02561	1.00000
	I	1.00000	1.00000	1.00000	1.00000		1.00000	1.00000	1.00000	1.00000
	L	1.00000	1.00000	1.00000	1.00000	1.00000		1.00000	1.00000	1.00000
	M	1.00000	1.00000	1.00000	0.91373	1.00000	1.00000		1.00000	0.93267
	O	1.00000	0.24469	1.00000	0.02561	1.00000	1.00000	1.00000		0.04126
	C-M	1.00000	1.00000	0.00013	1.00000	1.00000	1.00000	0.93267	0.04126	

Source: Own processing

3 Cluster analysis

K-means clustering method divides the dataset into three clusters (the optimal number of clusters is determined based on the results of hierarchical clustering), see Tab. 8. The largest is cluster 1 with 580 observations, followed by cluster 2 with 389 observations and cluster 3 with 214 allocated observations. The observations (1183 observations in total) are allocated into the 3 clusters in the following ratio: cluster 1 covers 49 %, cluster 2 covers 33 %, and 18 % for cluster 3. The average distance of the cluster from the cluster mean is almost comparable in clusters 1 and 2, with only a slight difference; in contrast, cluster 3 reaches almost a third higher average distance. The range of the centroid distance (a centroid is a company that reaches the values with the lowest deviation from the average of the cluster) and maximum distance of the cluster is the lowest in cluster 2, followed by cluster 3 and cluster 1.

Table 8 Characteristics of the defined clusters

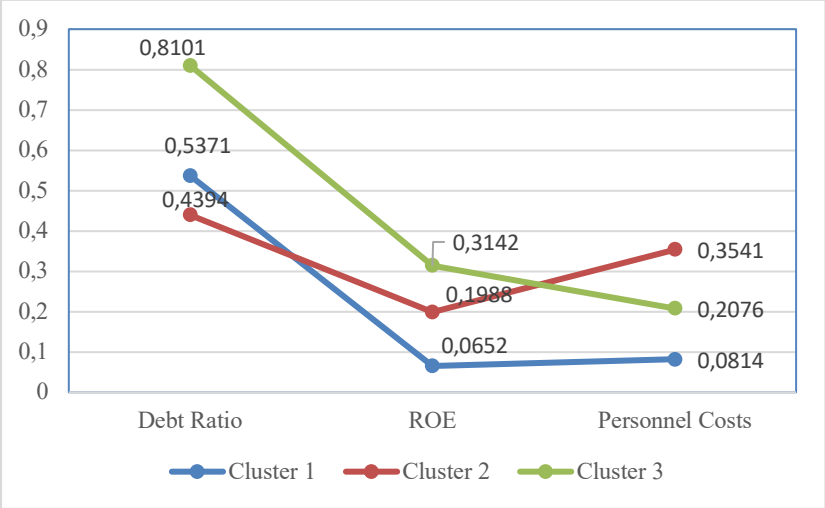
Characteristics	Cluster 1	Cluster 2	Cluster 3
Minimal distance (centroid distance)	0.070	0.040	0.120
Average distance of the cluster	0.544	0.578	0.797
Maximum distance from centroids	5.790	1.650	4.900
Size (number of observations)	580	389	214

Source: Own calculation in STATISTICA 12 SW

3.1 Cluster Evaluation

We describe each cluster of family businesses by using three points of view: financial indicators used for cluster analysis, representation of regions in clusters, and representation of sectors in clusters. Figure 3 shows the cluster differences in debt ratio, personnel costs, and ROE. A detailed evaluation of the individual clusters is given below.

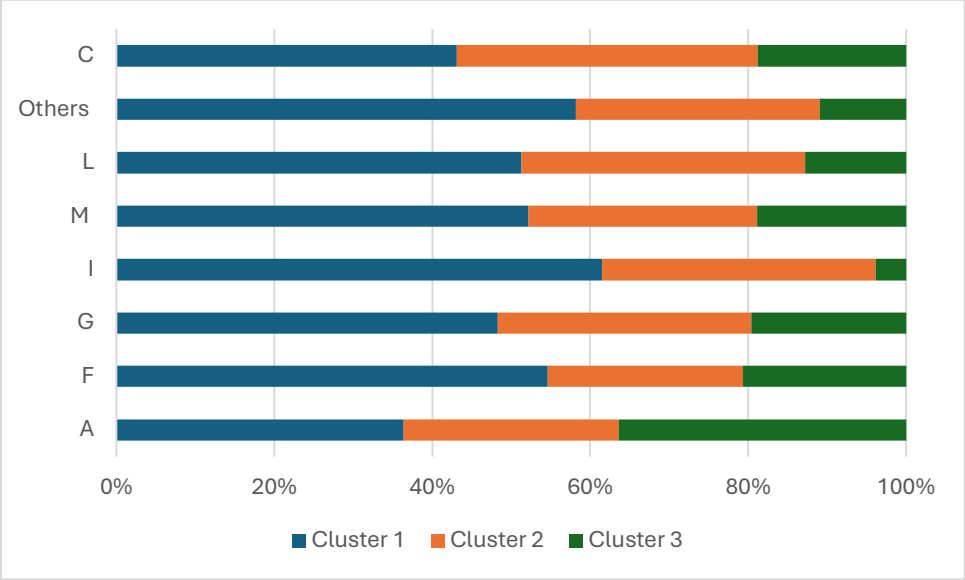
Figure 3 Average values of the clusters



Source: own calculations based on Albertina Gold Edition Database

Fig. 4 shows how the sectors are represented in the individual clusters. The first cluster contains the largest number of companies from the accommodation, catering, and hospitality sector (I). Cluster 2 is predominantly made up of family businesses from the manufacturing industry (C), while the third cluster consists mainly of agricultural businesses (A). More detailed descriptions of the clusters can be found in the following subsections.

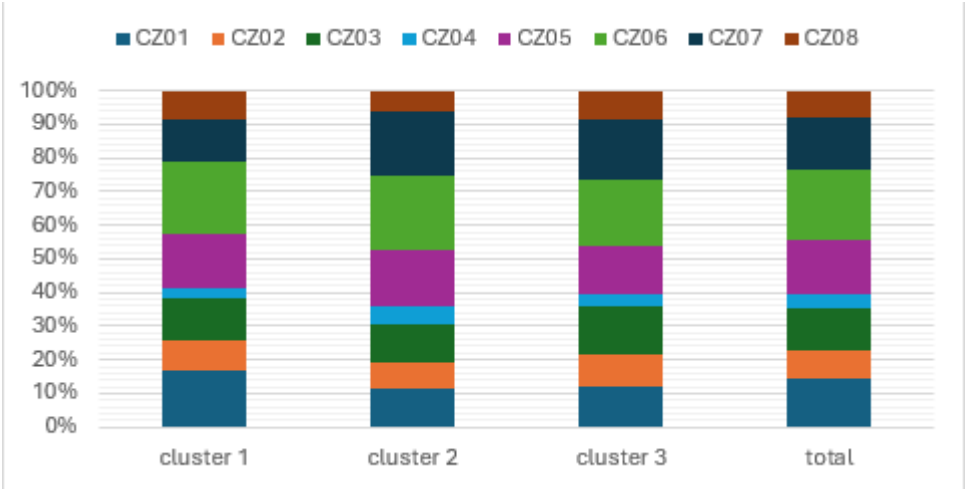
Figure 4: Representation of the sectors in clusters



Source: own calculations based on Albertina Gold Edition Database

Fig. 5 describes the shares of NUTS 2 in clusters. The regions are represented relatively evenly in all clusters. This may mean that the region does not affect the specifics of the groups of family businesses in clusters.

Figure 5 NUTS 2 ratios in clusters



Source: Own processing

Cluster 1 - technologically demanding industry

Regionally, cluster 1 is most represented by companies based in the Capital City of Prague (17%), followed by the South Moravian region (16%) and the Pardubice region (10%). The first two mentioned regions represent the highest achieved ratio of regions in the clusters overall. This value was then achieved only by the South Moravian Region in the 2nd cluster. There are a total of 3 regions exceeding the 10% threshold, and they cover a total of 43% of the records included in cluster 1. Only two regions here have representation at a level close to 1-2% of the cluster.

The average debt ratio slightly exceeded the 0.5 mark, which means liabilities outweigh own capital by 3.7% on average. In terms of debt, this cluster is in the middle of the rest, whereas in terms of equity performance, it reaches the lowest values by far. Compared to cluster 2, it is at a third level and is not even remotely close to the values of cluster 3.

In addition, these are companies whose ratio of personnel costs to total costs is at the level of 8%. Therefore, it is a technologically demanding industry with a lower proportion of human labour. This is also confirmed by the far lowest added value compared to the other clusters (approx. 1/3 compared to the other two clusters).

Regarding the representation of the industry in cluster 1, the largest group is the CZ NACE C companies, i.e., manufacturers (32% of the cluster). Next in order are G (traders) and F (constructions). Together, these three groups of companies cover almost 70% of the total cluster. If we focus more closely on C - i.e., production, then the largest group consists of companies involved in industrial production, companies engaged in metalworking, followed by those focusing on wood products and furniture.

For cluster 1, the ratio of companies regarding the size is 80% in favour of micro-enterprises, small companies represent 17.9%, while medium-sized enterprises represent just over 2% of all selected enterprises.

The companies in this cluster achieve, nominally, the highest cost of goods sold or delivery of services (the average value is at the level of 4.8 million).

Most companies in this cluster focus on business activities with lower value added, but which require a technological background and use a considerable amount of fixed assets.

Cluster 2 – equity and retained earnings

The representation of individual regions in cluster 2 is more unequal than in cluster 3. As in cluster 3, the South Moravian Region has the highest share in cluster 2 (16%). Second is the Zlín Region with 12% of businesses (it covers almost 41% of the Zlín Region companies in total), followed by the Capital of Prague with 11%. The Karlovy Vary Region has the smallest share only 1%, as well as the Ústí Region, Liberec Region (with respect to the total counts of the companies from the Liberec Region this cluster gain almost 64 %) and Plzeň Region with 4%. The first 3 regions with the highest representation represent a total of 39% of the cluster.

The most numerous group contains micro-enterprises with 60% representation; small enterprises reach almost 36%, which makes cluster 2 the cluster with their highest representation. Medium enterprises represent 4%. The largest group in cluster 2 contains producers who make up 43% of the entire cluster (of which 17% are metal and 13% are unspecified activities of producers), followed by wholesalers and retailers with 19% each.

For cluster 2, personnel costs are dominant, representing more than 35% of total costs. The return on equity here is almost 20%. On average, the indebtedness of these enterprises is by far the lowest and reaches a 10% lower value compared to cluster 1. These are enterprises that finance their activities mainly from their own sources. Related to this is the by far highest ratio of retained earnings to total assets (more than 34%) compared to other clusters. Cluster 2 reached average values of the retained earnings in millions of CZK, which is 2 times the value compared to cluster 1 and almost three times the value compared to cluster 3.

Companies from cluster 2 declare the highest ratio of personnel costs to total costs. These facts are related to the range of products, including also products with precise requirements of individual adjustments and manual work. Family businesses in this cluster use external sources of financing the least. The reason for not using external sources of financing may be not only

the fact that the company does not need them, but also a possible fear of debt and exposing the family business to risk.

Cluster 3 – "We use debt financing to the maximum"

Cluster 3 is the most even one regarding the regional representation. The highest share is held by companies from the South Moravian Region (13%) and the capital Prague (13%), followed by the South Bohemian Region and the Zlín Region, both with 11%. Other regions are below 10% representation, and the Karlovy Vary Region, Liberec Region, and Ústí Region have the smallest share (less than 1% of the total number of enterprises). The first four regions with the highest representation (each exceeding 10%) claim a total of 48% of the cluster.

The cluster contains 72% micro enterprises, 26% small enterprises, and less than 2% medium enterprises. Industrial sectors included are wholesale and retail (28%), manufacturing (38%), and construction (17%). Metalworking represents 17% of the manufacturing companies.

Companies from cluster 3 have a completely different approach to financing. Compared to the cautious and protective financing method of the previous cluster, these companies are not afraid of debt financing. The average value of external capital in the cluster is around 81%, and the company with the lowest distance from the average value of the cluster even reaches a value of over 93%.

This cluster has the highest level of debt financing on average, with an average value of 81%. This is also related to the relatively high ROE (31.4%), which reaches such high values, thanks to the low level of equity capital. In contrast, the ROA, i.e., the profitability of total assets, reaches 5.3% on average, which is, for example, almost double the value compared to cluster 1 (2.8% ROA). Hence, retained earnings are the lowest in this cluster, they are around 11% of the total value of the company's assets on average.

Therefore, higher debt can help improve business profitability, i.e., by utilizing company assets. Thus, the effect of financial leverage is confirmed here. Furthermore, cluster 3 achieves the highest total costs, exceeding CZK 45 million, and the total assets of the companies exceeding CZK 51 million on average.

We can assume that if a company uses debt financing, it will increase its overall profitability. This can facilitate and accelerate its development.

Statistical evaluation of the differences between clusters

The clusters described above were subjected to statistical testing of mutual differences. Due to the characteristics of the dataset, the Kruskal-Wallis statistical test was used. Tab. 9 describes

the p-values of the mutual pairs of the measures used for cluster construction. The pairs with significant differences at the 0.05 significance level are marked in red.

Table 9 Statistical evaluation of the differences between clusters

p-value, significance level 0,05	Cluster 1	Cluster 2	Cluster 3
Cluster 1 ROE		0.00	0.00
Cluster 2 ROE	0.000000		0.147936
Cluster 3 ROE	0.000000	0.147936	
Cluster 1 Personal Costs		21.04544	9.33780
Cluster 2 Personal Costs	21.04544		7.42999
Cluster 3 Personal Costs	9.337796	7.429994	
Cluster 1 Debt ratio		0.000000	0.000000
Cluster 2 Debt ratio	0.000000		0.000000
Cluster 3 Debt ratio	0.00	0.00	

Source: Own computation based on results from SW Statistica 12 and MS Excel

Thus, significant differences were found for almost all combinations. The only exception comprises the ROE indicator from the clusters 2 and 3 comparison. Based on these results, we can therefore reject the H0 and confirm the differences between clusters.

Although the stated value of ROE is by far the highest (compared to the other two clusters), it is caused by a very low equity ratio. In this case, it would be more appropriate to use the ROA, which reaches 3.6%, which is incomparably lower than the 55% ROE.

CONCLUSION

The paper focuses on differences between geographical and sectoral groups of family firms in the Czech Republic in relation to their financial characteristics, a topic that has so far been marginally addressed in research on family firms. The main objective of this paper is to assess the significance of individual factors influencing financial characteristics of defined groups of family businesses based in the Czech Republic, categorised by region and sector.

The structure of the results of the paper is as follows: The first part was a separate evaluation of the monitored indicators in the regions and higher administrative units; then we focused on the differences between sectors, and finally, we evaluated all three main indicators together in a cluster analysis.

The most noticeable differences are between groups of family companies divided by NUTS 2 regions, where mutual differences in personal costs are more often observed. On the other hand, only one combination of regions has a significant difference in debt ratio. When we

compared the production sectors, significant differences were found between manufacturing, construction, and wholesale and retail trade.

The cluster analysis also confirms some regional and sectoral differences, but the overall results of the companies are more balanced than when the indicators were evaluated separately. The approach of family businesses to debt financing is crucial here, when most companies are rather risk-averse and use mainly their own capital for financing.

The results of the research reflect only those businesses that have voluntarily signed up to the ASME family business register; other family businesses are missing. With a few exceptions, the companies in the sample are not subject to audit. Therefore, the quality, correctness, and completeness of the reported information are difficult to verify. Family businesses also include a large group of entrepreneurs who do not even keep accounting records at all. This corresponds to the low number of detailed economic studies. That is the main reason why we used the obtained data, despite their limitations, for the most detailed analysis possible, which the scope of this contribution allowed us.

Future research will aim to expand our dataset (in terms of the number of family business units and research period) and to include a foreign comparison. Family businesses in the Czech Republic would also deserve an analysis in the broader context of the connection between financial and functional analysis.

In the literature, there are possible to find two partial contractionary views on the relative use of debt by family companies compared to other types. The first one highlights the risk aversion of family firms due to their owners' low wealth diversification and argues that family firms avoid debt because of the accompanying increased bankruptcy risk (Mishra, McGonaughy, 1999; Anderson, Reeb, 2003). The second perspective, represented by Croci, Doukas, and Gonenc (2011), argues that family companies prefer debt as a nondiluting financial strategy over raising new capital for company development, which does not affect the ownership structure. Both approaches to debt financing are also evident in our study, where firms from cluster 2 show low debt ratios and, in contrast, cluster 3 very high values of debt financing. Overall, our study supports the first theory, as cluster 1 also shows a preference for lower debt. Therefore, we can summarize that our sample of family businesses has a tendency towards low debt. Hansen, Block (2020) in their study confirmed the risk-aversion of family business due to a lower debt ratio.

In the process of establishing a company, it is imperative to comprehend the competitive environment and the distinctive characteristics of each region. These elements can significantly impact the company's future development, influencing strategic planning, overall riskiness, and

potential future opportunities. The combination of return on equity and debt can point to a paradox, whereby high debt of a firm will simultaneously induce a high ROE. However, this is only due to the low amount of equity, and the riskiness of high indebtedness must be taken into account to assess the financial health of the firm. Despite the high ROE value, the firm may be experiencing significant financial difficulties. Consequently, financial indicators must be evaluated within the parameters of the individual firm and in the broader context of the region and sector.

The most statistically significant differences are observed between groups of family firms divided by NUTS 2 regions, where mutual differences in personnel costs are more frequently observed. Conversely, a single combination of regions exhibited a substantial discrepancy in the debt ratio. A comparison of manufacturing sectors reveals significant disparities between manufacturing, construction, and wholesale and retail trade. The cluster analysis also confirms some regional and sectoral differences, but the overall performance of companies is more balanced than when the indicators are assessed separately. The key issue to consider is how family firms approach debt financing, with most firms preferring to avoid risk and generally using equity capital for financing.

In the context of the relative absence of aggregate statistics concerning the financial performance of family businesses, the results can be utilised by family business proprietors to establish a benchmark for their financial situation. The refinement of the results with respect to regions and sectors, despite the reduced number of firms involved, renders these values more precise and more useful for a specific, narrowly focused firm. The values presented will facilitate benchmarking at the sector and regional level for family business owners, as well as helping with the early identification of risks in three key financial management issues: optimal debt levels, sufficient return on equity, and personnel costs. Consequently, the research findings are beneficial for managers and owners of individual family firms, other stakeholders, and can serve as a foundational framework for subsequent research activities.

The survey results reflect only those firms that have volunteered to join the ASME family firm register; other family firms are not included. With a few exceptions, the companies in the sample are not subject to audit. Consequently, the veracity, precision, and thoroughness of the reported information are challenging to ascertain. It is evident that a significant proportion of entrepreneurs within the family business sector do not maintain accounting records. This is consistent with the paucity of detailed economic studies in this area. Subsequent research will aim to expand the existing data set, both in terms of the number of family businesses covered

and the length of the research period. Additionally, foreign comparisons will be incorporated into the study, thereby facilitating a more comprehensive international analysis.

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Original scientific paper

QUALITATIVE RESEARCH THROUGH Q-ANALYSIS: GATHERING RESEARCH EVIDENCE IN THE SUCCESSION PROCESS IN SMES, PILOT STUDIES

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Abstract

Succession planning in small and medium-sized enterprises (SMEs) is a critical challenge that can determine the sustainability and growth of a business. This study explores the application of Q-methodology to assess the alignment of perspectives between incumbents and successors during the succession process in SMEs. Through a qualitative analysis of case studies from three different organisations, the research evaluates how the convergence of opinions impacts the success of leadership transitions. The study combines narrative analysis with Q-methodology, enabling both qualitative and quantitative insights into succession dynamics. Data were collected through semi-structured interviews with incumbents and successors, followed by Q-sorting exercises to map opinion alignment. The results reveal varied outcomes, showing that a high degree of opinion alignment does not always guarantee successful transitions. This is demonstrated in the museum case, where the transition was less successful despite exhibiting the highest level of opinion convergence. Conversely, the electrical components company, which had lower alignment, experienced a smoother transition, highlighting the importance of structured succession planning alongside opinion convergence. The findings suggest that while opinion alignment is a factor, successful succession also relies on the preparedness of both parties and a well-structured process that addresses interpersonal issues. This research contributes to the literature on SME succession by demonstrating the utility of Q-methodology in analysing leadership transitions and by providing insights into the complexities of opinion alignment and its role in successful succession planning.

Keywords: Leadership Transition, Propositional Analysis, Q-methodology, Small and Medium-sized Enterprises (SMEs), Succession Planning.

INTRODUCTION

Companies, especially smaller ones, struggle at some stage in their existence to find a suitable successor to an existing manager; this is often a planned process but sometimes occurs unexpectedly. Non-profit organisations also have specific succession problems. This may be related, among other things, to the fact that their primary objective is to satisfy a particular

social service rather than to generate profit. The research examines the congruence of opinions between the incumbent and the successor in small and medium-sized enterprises. Acharya et al. (2020), in relation to the lack of information in decision-making, point out that when businesses cannot obtain sufficient information about applicants, they hire fewer applicants to minimise losses from hiring unsuitable employees. Businesses that have used external consultants have argued that they focus primarily on hard issues, often forgetting that the real key to effective succession planning management is managing soft issues (Cesaroni and Sentuti, 2017). Chhabra et al. (2023) highlight that the following factors are important for the development of human capital in an entrepreneurial environment: skills, experience, innovative thinking and the ability to deal with risks. They also state that the time it takes for a successor to prepare for a managerial position influences their success. Adebayo (2020) noted that a significant degree of uncertainty is created by the insufficient number of candidates (or, on the contrary, a large number of candidates) for all stakeholders (investors, customers, suppliers, but also employees). Knowledge of the company is essential, as it will be necessary for the successor to determine the strategy in the medium term (3-5 years). Within the framework of company management, it is advisable to focus on a limited set of core competencies, rather than attempting to master them all (Dessein et al., 2016).

In a family business, according to Roth et al. (2017), succession preparation, i.e. professional preparation of successors and the use of consulting bodies (family council, board of directors, advisory committee), play a key role in succession planning. Communication and mutual understanding between the incumbent and the successor are also key to a successful succession. Selecting a successor is a complex process that combines personality traits, skills, relationships and experience (Udomkit et al., 2021). For a successful handover to occur, it is often necessary to emotionally detach from the process (Umans et al., 2020). This emotional detachment reduces the risk of conflict and supports the succession planning process.

Drawing on multiple theoretical perspectives, our study focuses on management succession (rather than ownership transfer) in SMEs, viewed as a multifaceted phenomenon where various stakeholders interact, strategic decisions are influenced by the cognitive traits of top management, and conflicting incentives may arise. From a stakeholder theory perspective, successful succession hinges on actively engaging all internal parties, such as incumbents, successors, employees, and external advisors who collectively shape and legitimise the transition mechanism (Sharma, 2004). Complementarily, Upper Echelons Theory underscores

that the personal characteristics and mental models of incumbent leaders and potential successors critically influence strategic decision-making during the handover process (Hambrick, 2007). Furthermore, stewardship theory adds that when family leaders and their designated successors share common values and exhibit a strong sense of psychological ownership, the transition is more likely to reflect trust and a long-term orientation beneficial to the firm's sustainability (LeBreton-Miller and Miller, 2015). Conversely, agency theory reminds us that inherent conflicts – stemming from differing risk preferences and information asymmetry between principals and agents – can introduce agency costs that complicate the succession process (Fama and Jensen, 1983). Together, these theories provide a comprehensive framework for understanding why congruence in values and strategic vision between incumbents and successors, in this case, captured by the Q-analysis, is essential, as well as for identifying potential misalignments that might hinder a smooth transition in SME family businesses.

This article presents one possible method to organise information in a clear and structured system, allowing for the extraction of the most critical elements. People cannot process all available information in decision-making because of limited time or cognitive abilities (Matějka and McKay, 2015). It seems appropriate to deal only with selected information. But how to determine which ones should these be? The selection of information (data) depends on the dynamics of the succession process and the obstacles involved (Marques and Couto, 2020). Open communication between all parties involved and active participation of the incumbent appear to be key aspects. By starting the processes related to the transfer of ownership earlier, misunderstandings can be avoided, and conflicts minimised (exchange of information is guaranteed). The successor thus has sufficient time to prepare and contribute to a harmonious transfer of power. Pre-planned succession is also confirmed as crucial by the authors of the study Bozer et al. (2017). In addition, for family-owned companies, parties involved (including employees) also help the process by providing an objective (unbiased) and expert perspective. If the successor and the incumbent have different (divergent) views, a system of independent consultants (tertius iungens) can help, as described in their study Bertschi-Michel et al. (2021). The moderation process should thus bring together groups with different perspectives on succession while building competence.

To summarise, succession transfer is a critical process and a key issue for the entire company's success (Matias and Franco, 2020). Therefore, it makes sense to deal with it (structure and mechanisms) using different methods (e.g. Q-analysis). Since this study has the

task of applying within itself an analysis of statements, which is not entirely common, it can also be said to be classified as a case study, which aims to take lessons from a given case, examined through admirable or interesting practices (Hendl, 2016). The research presented in this article is characterised by a narrative approach to case studies (Stejskalová and Štrach, 2015); it is a typical case of an intrinsic case study – a combination of a personal case study and organisational analysis.

The Q-method is a unique technique in which respondents react transparently to statements based on structured (in-depth) interviews. The Q-analysis allows working with both qualitative and quantitative data. This study focuses on using Q-analysis in succession management (or succession of ownership) in small and medium-sized enterprises or non-profit organisations, as well as the firm's future development from the perspective of the incumbent and the successor. The study is characterised by a combination of propositional analysis from initial interviews with business owners and their successors, simplifying the researcher's work (Stejskalová and Štrach, 2015).

METHODOLOGY

Research question

The research question (RQ) was defined as follows: Does the congruence of opinions prior to the handover process lead to a successful leadership transition?

The answer to this question, three companies were selected for the research, each of which had experience with succession or was currently undergoing a succession process. An interview was conducted with both the incumbent and the successor from each company. These interviews formed the basis for the statements' analysis; afterwards, the respondents were asked to Q-sort the statements into a factor array. This process generated the input data for the Q-method. The combination of propositional analysis and the Q-method ensured high data quality and depth.

The focus of the study was on three factors: (1) how succession was handled, (2) the perception of the company’s future development, and (3) the likely leadership style within the company. Based on the information gathered, firm-specific recommendations emerged.

The Q-method analysis of the respondents' statements was conducted through the Ken-Q Analysis web application. The application's output was derived through a correlation matrix and factor analysis.

Characteristic parameters

Data collection preparation included 32 questions for a semi-structured interview, which formed the basis for the analysis of statements. This approach differed from most standard procedures, which tend to look for statements in the literature review. From the semi-structured interview, a set of cards with 25 statements – the so-called Q-set – was created, along with an A3 template for asking the respondents for statements, the so-called Q-sort. These were produced using the expert method for Q-analysis. The number of statements had to be chosen in such a way so that, when divided into arrays, they formed a quasi-normal distribution pattern, where the left section contained the statements with which the respondents agreed the least (negative opinion) and the right section expressed the highest level of agreement (positive opinion). The condition required an equal number (n) of statements expected to be rated positively and negatively. The pilot interview was conducted with a person not directly involved in the company (research subjects). The pilot interview was intended to debug the propositional logic – some statements were replaced or their polarisation adjusted. If, during the interviews, a respondent strongly leaned towards one side of the polarity (either negatively or positively), the relationships between these statements became decisive.

The sample for data collection included three companies from various industries, each with a turnover of up to CZK 20 million and less than 15 employees. In each firm, the intended successor was a candidate for the highest-ranking managerial position (job). All candidates were interviewed for approximately 40 minutes in a semi-structured format, with the session audio-recorded and accompanied by brief written notes. From these edited interviews, frequently repeated statements were selected. After a time interval, the interviewees were asked to sort the statements into an inverted "bell" array – a standardised step of the Q-method. The respondents first sorted the statements into three categories (negative, neutral, and positive). After the initial, respondents were asked to comment briefly on each stored statement. These comments provided additional information and confirmed that the respondent understood the task. The final Q-sort was recorded photographically. Thus, audio, textual and graphical records were archived for the entire research process.

Propositional analysis of interview data

The recordings of the interviews were transcribed in full text form. This full text was then converted into statements. An example of a transcription is a paragraph from an interview with the incumbent in a hospitality company.

Table 1 Excerpt from the interview (full text)

Please the company's industry. Interviewer (Ier), Interviewee (Iee)
Hospitality.
Ier – How many employees do you have?
Iee – About 14.
Ier – Plus, temporary workers, right?
Iee – Yeah, 3-4 temporary workers.
Ier – I'll ask for a turnover roughly?
Iee – It doesn't have to be roughly; we're doing 12 million a year.
Ier – Okay. The year the company was founded?
Iee – This company we're running now or the restaurant in general.
Ier – It'd be good if you could tell me the history of this restaurant, because the restaurant "Na Hlinisti" existed before, right?
Iee – It's been here for 150 years. There was a German owner here before the war, I can lend you an article about it. And the beginning of our company was about 2004. We renovated it for 5 years from our own money and then Plzeňský Prazdroj (Inc.) renovated it, to whom we committed to buy beer for 10 years.
Ier – And what's your legal form?
Iee – Limited company.
Ier – Do you have business premises here?
Iee – Me or the Ltd.? I also have a brewery restaurant. But that's a different company, right? Yeah, this company's just here.

Source: Šindelková (2019)

Statements from the entire interview were then sorted thematically into tables. A paragraph converted into statements looks like this:

Table 2 Paragraph from the interview converted into statements.

Identification data of the company in the hospitality industry
The company operates in the field of hospitality.
The company has about 14 employees and 4 temporary workers.
The turnover of the company is about 12 million per year.
The restaurant of the same name has existed for about 150 years, the current company has been in business for 14 years.
The legal entity of the company is Ltd.
The restaurant is located in Jihlava.

Source: Šindelková (2019)

The extensive text file was simplified by converting all the interviews into a simplified form, making it easier to extract the monitored parameters (e.g., turnover). There was only a partial

handover planned for the restaurant in 5 years; the successor had been with the company for 7 years and had started discussing succession with the current owner shortly before his departure. In the electrical components company, the handover was scheduled to take place in 4 years. A successor had been sought for 9 years in advance, and the selected person was not originally an employee of the company but was working in a technical field. The company had never planned for succession in other positions.

The handover had already occurred regarding the museum, and the board began searching for a successor six months after the director announced that he no longer wanted to serve. This was a year before he left. The board selected a successor who had worked for the organisation for 3 years as a PR manager. The restaurant and museum successors had both been with their respective companies for approximately ten years. In contrast, at the electrical components company, the co-owner had worked there for 20 years, and the successor had been employed for only ten months at the time of data collection.

However, other psycho-behavioural data, such as feelings and attitudinal values, could also be read from the statements. According to the incumbent of the restaurant position, the most critical competency was experience and communication with people; the successor emphasised similar traits, specifically communication and a positive attitude. The perspective of the incumbent and the successor in the electrical components company differed. According to the incumbent, the most important competencies are technical proficiency, business spirit and hard work, whereas according to the successor, business skills, people management, cashflow management and planning were prioritised. The incumbent in the museum stated that the most important competency was "giving life to the heritage". The successor cited creating vision, concepts, annual plans, oversight, motivation, effective use of resources, and ensuring the quality of the collection.

The most important criterion for selecting a successor was mutual trust, according to the incumbent of the restaurant. The successor highlighted reliability, solidarity and qualification. For the electrical components company incumbent, the most important criterion for selecting a successor was continuity of leadership, while the successor also emphasised industry experience and capabilities. The museum's incumbent identified the ability to reconstruct monuments as the most important selection criterion; for the director position, it was education, experience in the field, and familiarity with the company. The successor stated that knowledge of the museum industry, grants, and legislation was essential, and on these points, the predecessor and successor agreed.

The incumbents in all companies believed that their sudden departure would negatively impact the company's functioning. In contrast, all successors viewed the sudden change more positively. In line with ethical research standards, all participants provided informed consent, and their anonymity was strictly protected throughout the study. To ensure researcher neutrality, reflexive notes were taken during data collection and analysis, minimising potential biases in interpretation.

Data analysis by Q method – factor analysis

The Q-sort from each participant was processed using the Ken-Q Analysis web application (beta version). Each sort value, otherwise known as a factor loading (i.e., - - - to + + +), was assigned a numerical statement value for each respondent. The software calculated a Z-score (a weighted ratings average) for each factor loading. A unique set ("average Q-sort" or factor array) was created from all respondents' Q-sorts.

RESULTS

Factor analysis results

The resulting Q-sort indicated that respondents mostly agreed that employee satisfaction and minimal employee fluctuation were important. There were also statements suggesting that the ideal successor should possess skills exceeding the incumbent's. It was considered important to map the shortcomings of their company's employees.

Statements where employees were recognised for contributing to the company's values and striving for work-life balance were generally positively rated. For most potential successors, industry experience emerged as a central concern. Conversely, respondents largely agreed that their companies did not address succession at least 2 years in advance that successors did not need to have worked in their company for at least 10 years. Successors for leadership positions were not designated in most of the firms surveyed. Statements suggesting that some companies had a succession program in place or would be able to adapt quickly to a sudden change in leadership also received generally negative ratings from most respondents.

Scheme 1 Resulting factor array

----	---	--	-		+	++	+++	++++
12	4	17	24	7	14	18	19	25
	2	10	5	3	20	22	21	
		13	15	11	23	9		
			8	16	1			
				6				

Scheme 1 (continued)

Explanatory notes	
Value	**Textual statement**
1	The company has the potential to increase its sales.
2	For most prospective positions, we have a future successor.
3	I've worked in a similar position (and at a different company) for most of my career.
4	The successor must work in our company for at least 10 years.
5	I've always wanted to do what I'm doing today.
6	Change in management will have a negative impact on the company.
7	I had to work hard for my position.
8	I'm one of the most senior members of the staff.
9	The successor must be experienced in the field.
10	The company is able to adapt quickly to any change.
11	Ideally, succession planning should be completed earlier.
12	In our company, we plan for succession at least 2 years in advance.
13	I have been in my current field for a short period of time.
14	The most important thing for working in the management of our company is persistence and mental balance.
15	I've been with this company longer than I was with the previous ones.
16	The ideal successor would be able to bring our company to higher profits.
17	For succession we use our program.
18	We recognize employees for their quality of work.
19	The capabilities and shortcomings of our staff have been mapped.
20	Employees know the vision of our company.
21	The ideal successor has some better skills than me.
22	We strive for a work-life balance for our employees.
23	It is important to build loyalty among our employees.
24	Each employee has a development plan.
25	The satisfaction of our employees and minimal employee fluctuation are important to us.

The Ken-Q Analysis (beta version) application automatically calculated the correlation matrix of all respondents. The highest correlation between the incumbent and the successor was

observed in the organisation working in the museum sector (41% agreement). The incumbent and the successor had worked together in the company for 8 years. The correlation for respondents from the hospitality business was 11% (together in the company for 7 years). Respondents from a company in the electrical business even had a negative correlation (-2%, meaning their views were completely independent or even contradictory). At the time of data collection, the successor had been employed by the company for only 10 months and had not yet fully internalised the company's values.

Table 3 Correlation matrix

Incumbent / Successor	**Incumbent of the restaurant**	**Successor in the restaurant**	**Incumbent of the electrical components company**	**Successor in the electrical components company**	**Incumbent in a museum**	**Successor in the museum**
Incumbent of the restaurant	100	11	7	31	22	45
Successor in the restaurant	11	100	3	47	20	20
Incumbent of the electrical components company	7	3	100	-2	-14	-9
Successor in the electrical components company	31	47	-2	100	35	18
Incumbent in a museum	22	20	-14	35	100	41
Successor in the museum	45	20	-9	18	41	100

Synthesis of the results of propositional analysis and Q-method

For each respondent, statements from the interviews and Q-sort were compared. If there was a clear inconsistency, the information was assessed as invalid and discarded from further conclusions. Most of the time, the results were consistent, yet there were a few discrepancies. For example, the incumbent handing over the position in an electrical components company stated his shortcomings during the interview and ranked the statement "There are skills that the ideal successor should do better than I do" at position -4, the position to the far left, which expresses the strongest disagreement. Such data collection does not provide any useful insight.

Synthesis of results from the section focused on succession management

According to interviews with respondents, succession at the restaurant has only recently been addressed, and only for the managerial position. Statement No. 12: "In our company, we plan for succession at least 2 years in advance", also received a negative rating from both respondents. The length of experience is addressed in statement No. 4: 'The successor must work in our company for at least 10 years'. It is marked negatively for both respondents (even if the successor has been with the firm for 7 years; however, she has worked in the industry her entire career). Statement No. 9: "The successor must have experience in the industry" is rated positively by both respondents and is even at the extreme end for the successor. Thus, the Q-method confirms the information obtained from the analysis of the statements and gives a brief but clear overview of how succession is handled in the company.

The electrical components company also planned for succession for this position only and started 9 years in advance before the complete handover of responsibility and statement No. 12: "In our company we plan for succession at least 2 years in advance" was rated most positive by the incumbent, however, for the successor at this position -2 and during the interview and Q-sort comments, he stated that he did not know how long they had been looking for a successor before he started 10 months ago. Analysis of the statements indicated that training was already underway. Statement No. 4: "The successor must work in our company for at least 10 years" is ranked the most negated position by both respondents. The successor does not have direct industry experience but has a technical background and worked in the technical field and information technology. Statement No. 9: "The successor must have experience in the field" is ranked as the second most negated position by the incumbent and assigned a rank of 1 by the successor. In this case, the answer also depends on the point of view, i.e. whether a related field is also taken. In any case, the results of the two analyses do not contradict each other, providing a plausible picture of this firm's succession.

The museum was looking for a successor six months in advance, and statement No. 12: "In our company, we always plan for succession at least 2 years in advance" was rated the most negated by both respondents. The successor had worked in the firm for 3 years before becoming a director, and statement No. 4: "The successor must work in our firm for at least 10 years" was also ranked by both respondents in the very negative position. Statement No. 9: "The successor must have experience in the industry" is then rated neutrally by one candidate and positively by the other (suggesting an importance worth consideration). Overall, succession was the least addressed in this company, and the legal form of the organisation plays a role in this aspect. It

is a non-profit organisation where the board of directors elects the directors, as both candidates stated during the interview.

Synthesis of the results from the section focused on the future development of the company

An important aspect in succession is the question of the company's direction and whether two individuals will have corresponding conclusions. In the restaurant, the incumbent gave statement No. 1: "The company has the potential to increase its sales" the highest possible rating, and from the analysis of the respondent's statements, it is clear that sales are still trending upwards and there is potential for further growth. Whereas the successor stated that the turnover is constant and there is no more potential for further growth, as the turnover level is sufficient. Statement No. 1: "The firm has the potential to increase its sales" scored a factor loading of 1. However, respondents agreed on statement No. 10: "The firm can adapt quickly to any change"; both have neutral factor loadings. The incumbent said that leaving the firm immediately would be a significant problem for the company. The successor is more optimistic and thinks the firm could withstand the situation. Overall, there is some disparity of opinion in this company about the possibility of the company's growth, which may be a source of concern.

Respondents in the electrical components company are similarly divided (as in the previous company), with statement No. 1: "The company has the potential to increase its sales". The incumbent gave a neutral rating, and the successor the second most positive rating. The interview responses are consistent; the incumbent thinks the firm is established and has successful products to continue seamlessly after the handover. The successor says he would be happy for the company to continue as it is, and he thinks it depends on the staff. Both also think that the potential for further growth of the company is with reference to the successor's continued care. In statement No. 10: "The firm can adapt quickly to any change", the respondents disagree. The incumbent rated on a scale of -2, and the successor rated 1. During the interview, the incumbent stated that quitting overnight would affect the turnover, but the staff is said to be able to do many activities on their own. It would be necessary to find someone to run the company. The successor said there would be some losses, but the company would survive. In this company, respondents differ in some opinions, but there are more where they agree. Again, according to the Q-method, the successor has a slightly more optimistic view of a sudden change in management.

At the museum, the incumbent did not want to comment much on the growth potential, but the successor said that sales are increasing and there is potential for further growth (depending on grants and subsidies). Statement No. 1: "The company has the potential to increase its sales"

had a negative (-2) rating for the incumbent and a neutral rating for the successor. During the interview, the incumbent said that if the director left the company overnight, it would be a problem for the organisation, and the successor noted that the organisation would have to readjust itself to this situation. The rating of the statement No. 10: "The company can adapt quickly to any change" is the same for both respondents (-3). This is the most negative rating for statement No. 10 of the three companies.

Synthesis of results from the section focused on the respondent's likely leadership style

Leadership style is reflected in many aspects of the company's operations. In the restaurant, both respondents, when interviewed, answered the company values similarly. According to the successor, they are personal relationships, and in parallel, the other person stated that they are also related to friendly staff and customer satisfaction. They agree that family relationships work well in the company, and the composition of the staff is almost always the same. Employee satisfaction is said to be assured by above-average salaries, polite and fair treatment and good workplace relations. On statement No. 25: "Employee satisfaction and minimal fluctuation are important to us", respondents agreed with a rating of 3.

The incumbent in the electrical parts company mentioned customer trust as a value (goodwill) of the company, the successor mentioned a careful and reliable approach and decent behaviour. The company operates based on family relationships, and the staff composition has been the same for 15 years. However, they have selected different aspects in ensuring employee satisfaction, according to the incumbent, it is through increasing remuneration, informal relationships and social activities. According to the successor, it is through reasonable workload emphasising employee involvement (delegated responsibility). Statement 25: "Employee satisfaction and minimal employee fluctuation are important to us" received positive factor loadings for both respondents, 2 for the incumbent and 3 for the successor.

Respondents from the museum provided a similar assessment, with the incumbent saying that their value is for the institution to develop and have a positive external impact (both on the public and the wider environment). The successor has the added value of visitor and museum user satisfaction. The staff mix here is also stable, and the incumbent ensured their satisfaction by providing space for their development, friendly behaviour, and respect. The successor ensures employee satisfaction through benefits (financial and non-financial), a pleasant working environment, employee courses and free visits to family events for its family members. Here, respondents diverge widely. The Q-method shows that satisfaction is somehow important to both respondents, as statement No. 25: "Employee satisfaction and minimal employee

fluctuation are important to us" received a positive rating, 1 from the incumbent and 2 from the successor.

Recommendation for each company

Each company in the analysed sample is unique and has its own specifics. The restaurant is a management-led firm focused on strong, friendly relationships, which is also a reflection of the management style in which respondents agree the most of the three companies analysed. Succession has only recently been addressed here. However, the respondents disagreed on how the company should develop further. The incumbent sees potential for further growth here, but the successor thinks the current state is satisfactory. It is recommended to clarify the issues regarding the future development of the company and the direction the company is taking.

The electrical components company is also a company with very informal relationships, and they began to address succession with the greatest anticipation of the three firms analysed. The respondents have very similar views on the future development of the company. However, the management style of the employees is quite different, with the incumbent trying to motivate the employees in multiple ways and the successor looking at things very practically, wanting to focus on a reasonable workload. This is partly because the successor has been with the company for a short period. It will be necessary for the successor to engage more with the corporate culture to better motivate employees within the corporate paradigm.

In the museum, succession planning took the shortest amount of time. According to the successor in a state-funded organisation, succession cannot be planned, but a successor was sought at least six months in advance. This is most likely related to the negative assessment of the sudden change in management (the organisation was unprepared for it). Respondents differed in how they presented themselves, especially their varying views on ensuring employee satisfaction. The incumbent included satisfying social needs in motivation, while the successor used more material incentives. It is also recommended to prioritise interpersonal relationships, personal development, respect, self-fulfilment, and other non-material factors.

The reality of the three companies surveyed one year after the research was as follows: There was a succession in the electrical components company and the museum. In the restaurant, the planned successor became co-owner with the original owner.

DISCUSSION

The discussion of the results shows that a congruence of views between the incumbent and the successor does not always guarantee a successful handover of the company's leadership. The

highest level of agreement was found in the museum, but there was still a less successful handover, suggesting that the involvement of other factors, such as individual competence and the ability to adapt to new roles, is important in addition to mere agreement of views. This result supports the findings of Acharya et al. (2020), who highlight the importance of soft skills in passing on leadership. In addition, the results of the analysis show that companies that do not consider long-term succession planning face greater challenges during the transition to a new leader.

On the other hand, in the electrical components company, where the congruence of opinions between the incumbent and the successor was lower, the leadership handover was more successful. This contrast suggests that a successful handover can result not only from a congruence of opinions but also from a well-prepared and structured process that allows the successor to assume responsibility gradually. This is consistent with Cesaroni and Sentuti (2017), who state that effective succession depends on the ability to focus on soft skills and manage complex interpersonal issues.

It is also interesting to compare the role of the length of successor preparation in the leadership transition process. For example, in a restaurant, it was found that even though the successor had been with the company for seven years, the leadership handover was not fully realised, showing that the length of preparation alone may not always be a determinant of success. This finding is in line with the findings of Chabra et al. (2023), who highlight that personality characteristics, innovative thinking and the ability to manage risks play an important role in addition to experience and skills. Moreover, as Bozer et al. (2017) point out, the involvement of independent consultants can help to balance different opinions and bring a much-needed independent perspective to the process, which was lacking in the restaurant.

On the other hand, in an electrical components company, where the successor had been employed for a relatively short period, there was a smooth handover, suggesting that the ability to manage the transition process effectively may be more important than the length of tenure. This success confirms the importance of well-structured succession planning, as noted, for example, in a study by Matias and Franco (2020), which highlights the need for a clear vision and strategy in the handover process. In this case, it appears that a combination of professional preparation, strategic planning and mutual understanding between the incumbent and the successor can be a key success factor, even if the two parties have some differences of opinion.

Understanding and defining the different perspectives of parties involved in diverse business areas can be facilitated by, among others, the Q-method (Sneegas et al., 2021). The question of succession using Q-analysis was addressed by Barbosa et al. (2020), who identified aspects that

facilitate a female heir's takeover of a family rural farm. The method used contributed to the design of public and private interventions rather than identifying the need for congruence or incongruence in the views of the successor and the incumbent. Nevertheless, this study may prove important in developing techniques and focusing on future research.

Watts and Stenner (2012) state that Q-analysis allows key aspects to be seen among participants with a high level of qualitative detail. Our research has reached a similar conclusion, albeit only in a pilot study, and also leans towards another conclusion Watts and Stenner (2012) assert, i.e., that the Q-method does not provide data that can be generalised to a broader population, as it may not include all possible perspectives on the area of study.

The contradictions observed between respondents' interview responses and their Q-sort rankings call for further in-depth examination. One plausible explanation is that respondents may have misinterpreted the Q-sort task; while interviews allow for elaboration and nuance, the Q-sort method requires participants to allocate pre-defined statements into a forced, quasi-normal distribution. This task constraint may result in a differential understanding of statement polarity or meaning, thus causing discrepancies with their verbal accounts. Additionally, social desirability bias might have influenced respondents' oral responses; in the more interactive and less structured interview setting, participants could have felt compelled to present a more favourable image of themselves or their organisation, whereas the more anonymous and systematic Q-sort could have elicited responses that more closely reflect their underlying opinions. Finally, the time-pressured nature of the Q-sort exercise may have led to insufficient reflection on the relative importance of each statement, resulting in impulsive or superficial rankings that diverged from the more considered positions expressed during interviews.

These inconsistencies underscore the importance of employing a multimodal approach in researching business succession, as they reveal how different data collection modalities can capture distinct facets of respondent behaviours, intentions and attitudes. Future research would benefit from further exploration of contextual variables, such as time pressure, cognitive load, or emotional engagement, that may account for such discrepancies, thereby enhancing the interpretive robustness of findings in succession studies.

Limitations and Future Research Directions

The results of this study cannot be fully generalised to all aspects of succession. The data collection may have been influenced by the subjective attitudes of the respondents as well as their expressive skills, and there may be biases in the transcription (coding) and interpretation of the interviews. Analysing statements reduces the data, and some knowledge may be lost in

the process. However, by following a clear methodological procedure, data loss can be minimised to only those elements of minor or negligible importance to the research's purpose. As this is a pilot study, only three companies were selected.

CONCLUSION

The most valuable outcomes of the application were the correlation matrix, which recorded the agreement of respondents' classifications, and the Q-factor array, which displayed the resulting Q-sort composed of all respondents' answers. From the correlation matrix, it was possible to see which respondents agreed and disagreed most within companies. Additionally, the original data allowed identification of the specific statements where the disagreements occurred, and from the factor array, we could observe where all respondents most strongly agreed.

This paper aimed to verify the methods that contribute to the current use of the Q-method, which is primarily used abroad, and to introduce a modified version of the method of statements. The combination of these two methods should be explored further in future research. Researchers could build on this work and apply this combined approach in various studies. For example, one could investigate the relationship of agreement between the respondents' opinions and the number of years in the company, as already outlined in this paper. Alternatively, the relationship between the retirement age and the number of years spent in the company in a managerial position could be explored to assess the willingness to hand over leadership. Another avenue for future research could involve combining these methods with a personality type test and investigating the relationship between the respondents' opinions and their personality or managerial types. In short, there are a variety of ways in which the methods can be used to achieve a deeper understanding of the succession process.

The findings from our research can be interpreted through the frameworks of Upper Echelons Theory and Stakeholder Theory. Our results, particularly the observed variance in opinion alignment between incumbents and successors across different firms, underscore that individual differences in values, experiences, and mental models may critically influence leadership transitions' smoothness and eventual success. In our study, we define "succession success" using observable criteria such as the continuity of strategic vision, perceived satisfaction among employees, and operational stability in the post-handover period. For instance, despite relatively high opinion convergence in one case, the anticipated success in the succession process was not fully realised, indicating that more profound cognitive or personality disparities between the leaders may undermine the intended outcomes. This aligns

with the Upper Echelons Theory, which posits that top managers' personal characteristics and cognitive frameworks directly influence strategic decision-making processes, thereby shaping the succession process. Similarly, our findings emphasise the need for structured communication and coordination mechanisms to bridge differences among stakeholder groups, thereby fostering overall organisational stability and sustainability during the succession process. This is consistent with the Stakeholder Theory, which asserts that succession is not merely an internal leadership change but a multi-faceted process that involves complex interactions among diverse stakeholders, including family members, employees, and external advisors.

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Original scientific paper

THE PRICE DIFFERENCES OF HOUSING IN REGIONAL CONDITIONS IN SLOVAKIA. THE EVIDENCE FROM THE SPATIAL DATA

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Abstract

The research paper's main objective was to evaluate factors and disparities in the housing real estate market in regional conditions in Slovakia. For this purpose, a multiple linear regression (ANCOVA) model was employed. The results showed a statistically significant relation to factors affecting real estate housing. Economically, the most favorable housing locations are in cities and urbanized areas; in turn, the worst are in the countryside and periphery. The most expensive are city apartments, followed by the chalets and detached houses in the countryside. Higher housing supply in location makes the overall market more attractive, thus increasing the prices. Increasing distance from the local CBD and missing motorway in the region (LAU2 level) decreases the prices. The housing prices are heavily skewed towards Bratislava and the western part of Slovakia (except the Kosice metropolis), maintaining a significant regional gap between Central and East Slovakia. Overall results reflect differences in regional income and living standards in Slovakia.

Keywords: house estate market, regional disparities, regional factors, urbanization

INTRODUCTION

The population often moves and looks for housing in areas with access to jobs and services. The proximity of these areas generally lowers transaction costs, sparking the demand for housing and upwardly pressing the real estate market prices.

The paper aims to evaluate price differences in housing in the regional conditions of Slovakia. The regional disparities in Slovakia are also influenced by the prices and rents of dwelling sites, which in turn affect the affordabi0lity of housing. Location theories shall provide the theoretical basis for understanding factors affecting housing affordability and real estate rents and prices. The empirical part of the paper is based on the cross-sectional sample of real estate representing the bidding market prices provided by the real estate agencies. Price differentials are gauged by considering various factors affecting the market prices.

The paper's novelty is based on linking the traditional concepts anchored in location theories with empirical evidence varying across the regions and types of estates to extract the factors determining the market prices. A multiple linear regression model combining the quantitative and categorical variables (often called ANCOVA) was employed for the research. The model captures the economic, social, and geographic factors influencing real estate prices in Slovakia's regional conditions. The primary sample for the empirical investigation is based on the real estate data provided by business agencies in Slovakia. The sample was collected over the first quarter of 2024 on the regional level LAU1 (district), comprising $n = 1022$ units. The paper is organised as follows:

1. First, the theoretical part of the paper includes an analysis of the housing market in Slovakia and the EU
2. Second, the paper elaborates on location theories and empirics about real estate differences depending on economic and geographical factors
3. Methodological framework and research methods are outlined.
4. Research results are presented, especially the model fit and subsequent statistics.
5. Discussion and conclusions of the study are provided

The paper's results should provide a robust approach to understanding the factors involved in the determination of the prices in the real estate market in Slovakia. Based on the paper's results, recommending policies for housing affordability may be addressed.

THEORETICAL BACKGROUND

The importance and factors influencing the housing market

Bonnefoy and Krieger (2002) define housing quality as the physical state of an individual's dwelling and the quality of the social and physical surroundings where the dwelling is situated. According to globally recognised standards, suitable housing is defined by its affordability, livability, accessibility, location, and cultural appropriateness (Cohre, 2004).

The European Commission and other European Union institutions do not have jurisdiction over housing rights, and their resolution is entirely in the hands of the member states. Access to safe and affordable housing is a fundamental requirement for the prosperity of European citizens and society (Hegedüs et al., 2016).

The application of the right to housing is associated with two elements: the accessibility and affordability of housing. There is a fundamental distinction between the concepts of housing affordability and housing accessibility. Affordability can be assessed in various ways, leading to different interpretations of the problem and the most effective solutions (Pittini, 2012). Affordability is a market-based concept tied to the ability to pay. Housing is deemed

affordable for those who can pay for it, and thus, they gain access to it. Conversely, those who cannot afford housing do not have this access. Accessibility, however, is a humanitarian concept. Housing accessibility fundamentally signifies the goal of ensuring housing rights for all. Within this concept, housing is not a market good but a right that must be guaranteed for everyone. Access to housing pertains to the entire population, including those groups who often face limitations in exercising their rights to adequate housing in various ways (Sendi, 2011). According to Atfield (2013), housing affordability should not be mistaken for affordable housing, which is typically a specific type of housing intended to be cost-effective for low-income demographics. Affordable housing is more of a strategy to mitigate some of the demand related to recognised housing affordability issues.

The issue of housing unaffordability, particularly in prosperous metropolitan areas of the Czech and Slovak Republics, is a significant problem stemming from various social, economic, political, behavioural, and historical factors. Another contributing factor is the high degree of land ownership fragmentation, which is evident both technically (i.e., land size, quantity of land) and legally (numerous co-owners of the same, often small, land) (Machajdiková, 2010). Land fragmentation ownership involves the geographical scattering of land owned by the same individual, the inefficient configuration of land, their inadequate accessibility, and so on.

The economic theory considers housing as an economically 'scarce' factor. The economic scarcity of such goods implies their economic value, which can be realised through the market. Demand for housing is closely related to urbanisation. Urbanisation means the process of the cities' relative and absolute growth. Often, it was preceded by industrialisation, which relates to the scientific-technical revolution and economic development. Šilhánková (2007) distinguishes several types of urbanisation: 1) Direct urbanisation comprises moving from rural areas to urban. This type of urbanisation is typical for developing countries; 2) Indirect urbanisation means extensive population growth in the urban areas, which leads to further inner and outer movement within these areas; 3) Suburbanization is a term coined for suburb expansion. Other related concepts include urban sprawl, de-urbanization, and re-urbanisation, all connected with quantitative and qualitative settlement changes that profoundly impact the housing and real estate market.

The real estate market is where various agents pursue their economic interests. Wilhelmsson (2020) and Hott and Monnin (2008) point out several factors influencing housing prices. Interest rates exert a direct influence on property prices and an indirect effect on bank loans. Along with the population growth, inflation, income, investments and real estate taxes indirectly impact housing prices.

Lu and Shen (2022) examined the effect of urban leverage on housing prices in China, focusing on its influence on credit availability. Interestingly, this effect was not observed in third- and fourth-tier cities. A differential analysis further revealed that purchasing restraint policies intensified the negative influence of urban leverage on housing prices. The study underscores the significance of urban leverage as a critical factor influencing housing prices.

In their study, Bao and Shah (2020) examined the influence of home-sharing platforms, with a specific focus on Airbnb, on neighbourhood rental prices. The results of their investigation suggested that Airbnb's impact on rental costs is contingent upon the unique characteristics of each neighbourhood. The researchers advocated for policymakers to develop and implement customised strategies. These strategies aim to mitigate the platform's detrimental effects while capitalising on its economic advantages.

In an average household, housing costs constitute a significant portion of total expenses (Campbell & Cocco, 2007). In the US, housing expenditures represented about a quarter of the total household income (Bertaut & Starr-McCluer, 2002), while in Great Britain, this proportion was 35% (Guiso & Haliassos, 2001).

Income inequality also influences housing expenditure. Those with lower incomes struggle to afford adequate housing for their families. Conversely, wealthier individuals, who possess greater purchasing power, tend to occupy new areas (Soseco et al., 2017), effectively displacing those with lower incomes (Parra-Peña et al., 2013).

Baranoff (2016) discovered that families often gravitate towards neighbourhoods with similar households, further escalating housing prices and pushing out lower-income households.

The combination of low income and high rent can lead to adverse outcomes. Tunstall et al. (2013) reported that substandard housing conditions can impact child development and adult health. Yap (2015) found that lower-income individuals are often forced to relocate to unsafe areas or city outskirts. Even when factories relocate to these peripheral areas, they often do not provide employment opportunities for the poor due to specific recruitment criteria. The poor are vulnerable to natural disasters and climate change impacts in these hazardous locations.

Variations in regional mobility and living costs may counterbalance some of the escalating inequality between workers with high and low skill levels (Moretti, 2013). Conversely, rising housing expenses can intensify income disparity following housing costs (Albouy et al., 2016). Fluctuations in rental and housing prices can profoundly impact income inequality after housing costs. Changes in housing expenditure across the income distribution can also be triggered by demographic shifts, such as the proportion of single households, alterations in living space quality, or how income distribution affects individuals' access to housing support

and rent regulation (Belfield et al., 2015). A crucial yet under-researched question is whether, and if so, to what degree and why income inequality after housing has increased more than income inequality before housing (Saez & Zucman, 2016). This question directly affects consumption inequality, savings behaviour, and wealth accumulation. Furthermore, it is vital to evaluate the prospects of younger generations (Goodman & Mayer, 2018).

The comparison of incomes between homeowners and renters is not straightforward, as the income of homeowners includes not only the estimated rental value of the home minus the actual housing expenditure but also the capital gains and losses on housing wealth (Frick & Grabka, 2003). When we adjust homeowners' incomes by net imputed rents and capital gains, we observe that this only slightly alters the trends in inequality, both in terms of levels and changes over time. (Knoll et al., 2017).

Real estate market within the scope of the location theories

In the Marshall Principles of Economics (1920), the neoclassical theory of market equilibrium explains housing prices through the relationship between supply and demand in the real estate market. This causes the market to be diverse and complex, and its dynamics are affected by various factors such as demand, supply, economic conditions, legal regulations, and financing conditions (Marshall, 2013). Location theories substantially impact the real estate market, including apartments, houses and other commercial objects. In early literature, the concept of location was often related to distance. The relevance of housing within the scope of these theories is that housing prices decline as distance from the central business district (CBD) increases due to lower accessibility and higher transport costs. This basic urban model focused on the fundamental trade-off between accessibility and space in residential choice and was promoted by Alonso (1964), Mills (1967) and Muth (1969). In this context, the only spatial characteristic of a location is its distance from the CBD (Fujita & Thisse, 2002). The distance from the CBD incurs transport costs, which leads to the trade-off between the land value, which is the crucial concept in classical urban economics – the bid-rent curve (or bid-rent function).

Christaller (1933) contributed to this field with his central place theory. The market, transfer, or administrative principles may create the city's hierarchy. The theory helps to explain the hierarchy of urban centres and how accessibility to services and amenities can influence housing prices (Blažek & Uhlíř, 2021). The New economic geography developed micro-behaviorally based explanations of patterns of economic agglomeration in space. Two implications of this theory are that reducing transportation and communication costs leads to more significant agglomeration (through a 'home market effect') and that agglomeration patterns can continue to evolve as transportation and communication costs change (Donaghy,

2009). The NEG helped explain the price differences in housing because of agglomeration economies in cities, which drive house prices and rents.

Housing is not one of the areas harmonised by the EU legislation; however, regulations in different areas directly influence the formation of housing policy. At the state level, legislative changes have taken some measures to support investment in housing, social housing and infrastructure development to reduce regional disparities and stimulate internal mobility related to employment support. (ÚPSVR, 2020) The concept of social housing is commonly used across European countries, though its interpretation can vary. In Slovakia, the rental market is quite restricted – relatively small and unsupported, and concerns municipalities capable of providing only a small amount of social housing, adds Bajzíková and Bajzík (2020). On the other hand, Swedish municipalities must ensure housing for their residents. Publicly owned housing is rooted in a longstanding welfare state tradition Magnusson and Turner (2008). Housing costs are the basis for providing a rent allowance related to social assistance. Vagac (2013) notes that housing market conditions and housing policy are some of the economic factors that influence, among other things, internal labour mobility in Slovakia, with job opportunities usually concentrated in prosperous regions. Affordable housing can be seen as a barrier for many potential workers from less developed regions.

DATA AND METHODS

For the study, a sample of data from secondary sources was processed. The primary data source was real estate agencies providing current data on the prices of short-term and long-term residential spaces in various regions of Slovakia. The difference between short-term and long-term residential spaces is their occupation status – short-term spaces are used for short-term occupation (like chalets), and long-term spaces are used for permanent occupation (e.g. apartments and detached houses).

Because long-term data is unavailable, we have chosen the most recent records that are not older than 3 months. The cross-sectional data collection was conducted from January to March 2024. Subsequently, the data were categorised into qualitative classes while simultaneously collecting data on the factor variables that form the model's independent variables. For the study purposes, a multiple linear regression (ANCOVA) model was adopted, combining quantitative (house prices, distances, supply) and qualitative (type of dwelling, motorway in district, population density, location) variables. The reason is apparent: the housing price structure and variance are conditioned by various factors, which can be

approximated using quantitative and dummy variables. The choice of variables was primarily driven by data availability at the given regional level. Formally, it has been observed $x_i = x_1, x_2, \dots, x_n$ estates in $y_i = y_1, y_2, \dots, y_n$ Slovak municipalities. In the total $n = 1022$ sample units were collected. Approximately 5% of sample data was excluded because of extreme values. Those records in which the standard deviation from the sample median exceeded the multiple of three were excluded. A multiple linear regression model including qualitative – so-called dummy variables – was used for the study. The model "Housing Price" can be formalised as follows:

$$E(y|d,x) = D\alpha + X\beta + e \quad (1.0)$$

When $y = D\hat{\alpha} + X\hat{\beta} + \hat{e}$ (1.1)

When y is a vector of observation of the dependent variable – real estate price in €/m2 and vector of independent variables

$D_1 = \begin{cases} 1 \\ 0 \end{cases}$ if the motorway is in district, 0 otherwise

$D_2 = \begin{cases} 1 \\ 0 \end{cases}$ if appartment, 0 otherwise

$D_3 = \begin{cases} 1 \\ 0 \end{cases}$ if detached house, 0 otherwise

$D_4 = \begin{cases} 1 \\ 0 \end{cases}$ if chalet (weekend house), 0 otherwise

$D_5 = \begin{cases} 1 \\ 0 \end{cases}$ if the locality is in urban centre area, 0 otherwise

$D_6 = \begin{cases} 1 \\ 0 \end{cases}$ if the locality is in a n urban cluster area, 0; otherwise

$D_7 = \begin{cases} 1 \\ 0 \end{cases}$ if the locality is in a rural area, 0; otherwise

$D_8 = \begin{cases} 1 \\ 0 \end{cases}$ if location is in Bratislava region, 0 otherwise

$D_9 = \begin{cases} 1 \\ 0 \end{cases}$ if location is in West Slovakia region, 0 otherwise

$D_{10} = \begin{cases} 1 \\ 0 \end{cases}$ if location is Central Slovakia region, 0 otherwise

$D_{11} = \begin{cases} 1 \\ 0 \end{cases}$ if location is in East Slovakia region, 0 otherwise

x_1 – distance of estate from CBD of city district

x_2 – supply of similar estates (same function type) in a given municipality (per 1000 citizens)

The estimation of the model's matrix of estimators is given by

$$\hat{\beta} = (X'X)^{-1}X'y \quad (1.2)$$

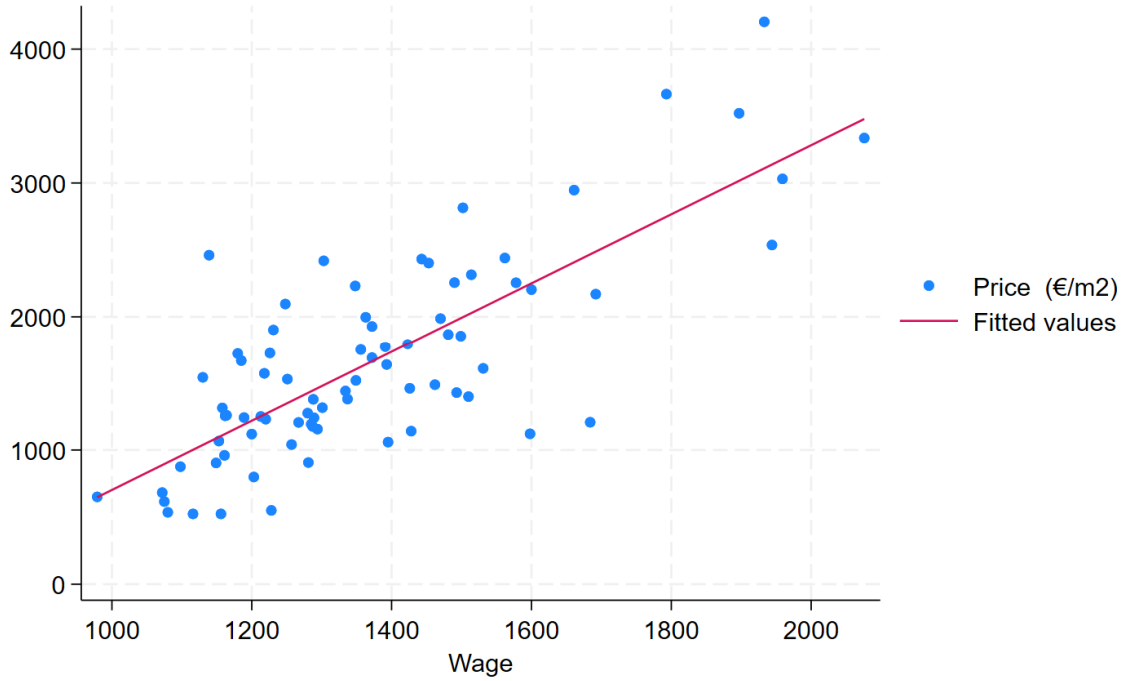
Or using the robust estimator

$$\hat{V}_r(\hat{\beta}) = (X'X)^{-1}\left(\frac{N}{N-k}\sum_i \hat{u}_i^2 x_i x_i'\right)(X'X)^{-1} \quad (1.3)$$

RESULTS

We approach the presentation of the results in several steps. First, the relationship between housing prices and income on the regional (LAU2) level should be investigated. For this purpose, locations in the research sample were matched with their respective districts, and the median housing price per district was computed. The regional median price of housing against the average wage was plotted.

Figure 1 The relationship between the price per m2 of housing and average regional wage

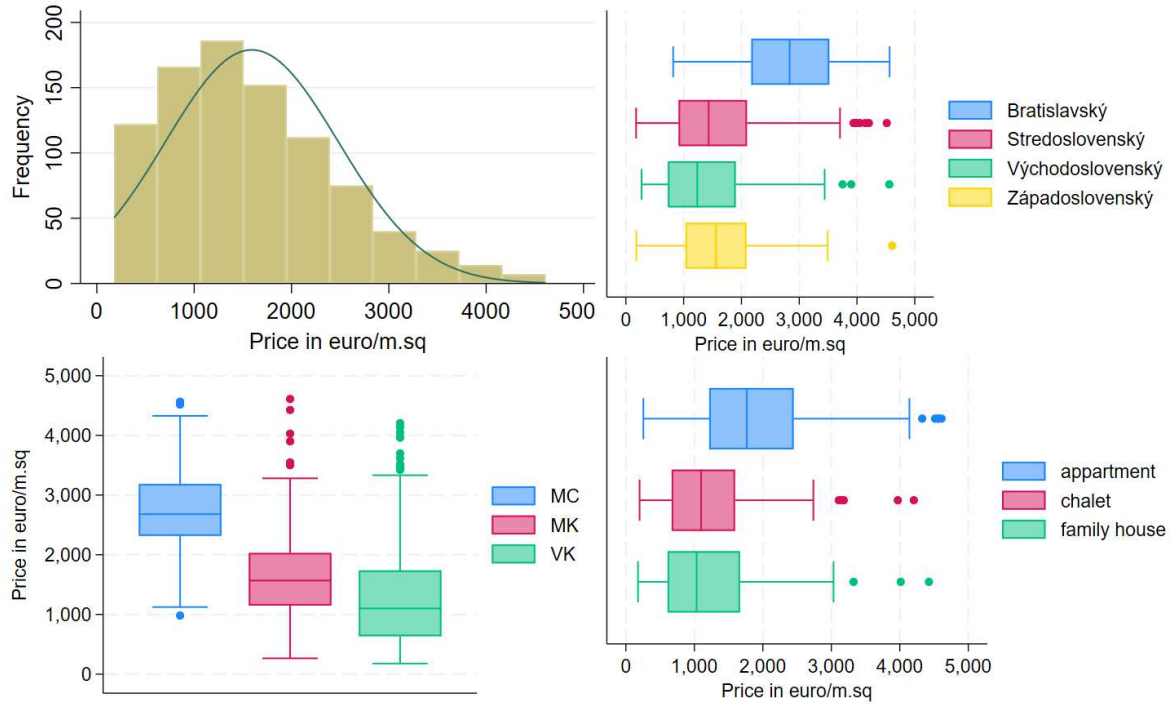


Source: Re/Max Slovakia, 2024

Fig.1 shows the relation between housing and average wage at the regional (LAU2) level. The chart shows the relatively tight bond between both variables; the correlation coefficient became $r = 0{,}775$ which is considered a strong correlation. Generally, we may say that a higher wage in the region means a higher price of housing (€/m2).

Next, housing is analyzed regionally. Regional housing is grouped by location, region, degree of urbanization, and type.

Figure 2 Comparison of housing in the regional scope of Slovakia



Source: Re/Max Slovakia; Georeal s.r.o., 2024

Fig. 2 shows a comparison of housing in Slovakia's regional scope. Fig. 2 (upper left) shows the probability distribution of locations by housing price (€/m2). The distribution represents a right-skewed pattern, showing a concentration of locations in the lower-value levels. The skewness and kurtosis suggest some data heterogeneity. Next, figure (upper-right) shows the distribution of housing prices by the region (NUTS 2 level). The box plot chart shows the highest average housing price in the Bratislava region, followed by the Western-Slovakia region (Západoslovenský kraj). Other regions (Central Slovakia and Eastern Slovakia) show similar values with long whiskers and outliers.

Fig.2 (lower left) shows price distribution by the degree of urbanisation. The box plot chart shows the highest average price of housing in urban centres (MC), followed by urban clusters (MK) and rural areas (VK). All plots show long whiskers, highlighting the data variability. Finally, the lower right chart shows price distribution by the type of housing. On average, the most expensive is apartments, followed by detached houses and chalets. Box plots show long whiskers with outliers suggesting the data variability.

In the following section, the "Housing price" model, including statistical inference, is presented. It is necessary to note that, in terms of the functional form of the regression model, a so-called "log-lin" model was applied, in which the dependent variable (price) is expressed

in logarithmic form. This is due to reduced potential heteroscedasticity in the observations of the dependent variable. Then the parameter of the independent variable expresses the ratio between the relative change in the dependent variable and the absolute change in the independent variable. If we multiply the parameter by 100, we obtain a percentage expression. Moreover, when using qualitative variables in the model, the "first category" within each qualitative variable must be "omitted" to avoid perfect collinearity between the variables. Consequently, the other categories within the examined qualitative variable represent the difference compared to the first category of the qualitative variable, expressed in percentages.

Table 1 Results of the ANCOVA model

lnprice	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
supply	.02	.002	8.84	0	.016	.025	***
CBD_dist	-.009	.002	-3.66	0	-.014	-.004	***
Motorway	.208	.038	5.49	0	.133	.282	***
Housing :							
Detached	-.428	.049	-8.67	0	-.524	-.331	***
Chalets	-.229	.058	-3.93	0	-.344	-.115	***
Urbanisation:							
MK	-.384	.039	-9.88	0	-.461	-.308	***
VK	-.525	.055	-9.47	0	-.633	-.416	***
Region:							
Stredoslovenský	-.398	.05	-7.89	0	-.497	-.299	***
Východoslovenský	-.347	.06	-5.75	0	-.465	-.229	***
Západoslovenský	-.186	.059	-3.13	.002	-.302	-.069	***
Constant	7.997	.063	126.84	0	7.873	8.12	***

Mean dependent var	7.170	SD dependent var	0.631
R-squared	0.391	Number of obs	880
F-test	75.510	Prob > F	0.000
Akaike crit. (AIC)	1272.880	Bayesian crit. (BIC)	1325.459

**** p<.01, ** p<.05, * p<.1*

Source: Own processing based on Re/Max Slovakia and Georeal s.r.o. data, 2024

In Tab. 1, the results of the "Housing Price" model are shown. From a general perspective, the model can be considered highly statistically significant at the given significance level of $F = 75.51; p < .001$ $p = .00000$. The coefficient of determination $R^2 = 0.391$ assessed as an average explanatory power of the model. However, as Acock (2018) states, in socio-economic research, even an R^2value greater than 0.3 can be considered a "strong" explanatory power. Additionally, the research is based on cross-sectional data collected at the local level, where many potential factors could not be assessed or would be redundant, as observations from the same locations often appear. Finally, real estate prices are also influenced by inertia in

development, while the model is based solely on cross-sectional data and does not account for lagged variables.

From the perspective of the individual results of the model, all factors represented by the independent variables were statistically significant ($p < .01$). Regarding quantitative variables, the supply of similar properties within a locality tends to increase property prices (on average by 2% per square meter), which was expected since real estate agencies prefer locations with prevailing market demand. Additionally, district connectivity to highways tends to increase property prices by up to 20% per square meter, highlighting regional disparities within the regions. Increasing the distance from the central business district (CBD) within a given district tends to decrease property prices by -1% per kilometre.

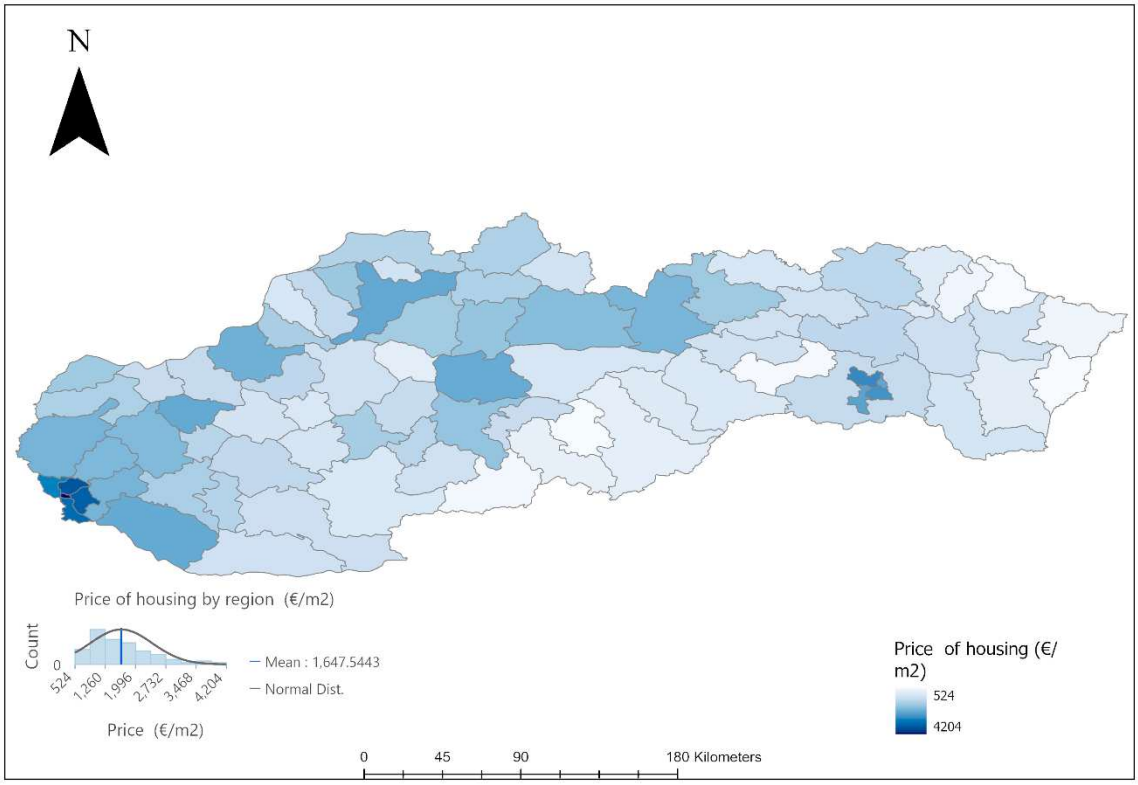
For the categorical variable "residential objects," the highest price per square meter is paid for apartments, followed by houses, which are, on average, 43% cheaper per square meter, and recreational houses, which are about 23% cheaper than apartments. The relatively large price differences between these types of properties can be explained by often outdated detached houses in rural areas, where only the land is expected to be used, and the house price is often low. In the case of recreational cottages, the spatial remoteness from the district town may play a role in determining the price.

For the categorical variable "degree of urbanization," the highest housing prices are in cities (urban centers), while prices decreased by up to 38% in urban clusters and by up to 53% on average per square meter in rural areas, emphasizing the differences between urban and rural areas.

The categorical variable "Region" expresses the differences in housing prices between regions at the NUTS2 level. As expected, the highest housing prices are in the Bratislava region, followed by the Western Slovak region, which decreased by 19%; the Eastern Slovak region, which decreased by 35%; and the Central Slovak region, which decreased by up to 40%. Surprisingly, average housing prices in the Eastern Slovak region are 5% higher than in the Central Slovak region.

Finally, the regional housing distribution may be evaluated through the GIS application. For this purpose, ArcGIS Pro 3.2 was used.

Figure 3 Price of housing distribution on regional level (LAU2)



Source: Processed in QGIS based on Re/Max Slovakia and Georeal s.r.o. data, 2024

Fig.3 shows the price distribution of housing on a regional level (LAU2). We may observe the spike in metropolitan regions like Bratislava (Western Slovakia) or Kosice (Eastern Slovakia), followed by clustering of prices around Bratislava on the West and North of Slovakia. In turn, the Southern-Eastern and far-eastern parts of Slovakia experience the lowest housing prices on average, further highlighting the regional disparities in income and living standards across Slovakia.

DISCUSSION

The paper aimed to investigate housing price differences and factors influencing housing in Slovakia's regional conditions. The results have pointed to stark differences, highlighting the traditional regional gap between the western part of Slovakia, namely Bratislava, and the far east, except the Kosice metropolis. These city metropolises have become clear outliers. Speaking about the regional level (NUTS 2), the price differences have moderated. The Bratislava region gained a clear edge; however, other regions (West et al.) have similar housing prices. The unique position of Bratislava in the Slovakian urban hierarchy was

highlighted in several studies by Car (2018), Dluhoš (2017), Messner and Zavadil (2014). NBS (2020) pointed out that differences between the price/rent of estate assets are primarily caused by the unique position of Bratislava in the system of cities in Slovakia.

A multiple regression (ANCOVA) model was used to model the housing prices. The results indicated a statistically significant relationship between housing prices, housing supply, and distance from the CBD among the quantitative variables. Regarding the supply of similar housing, the results may disagree with classical economic theory; however, the abundant housing supply should also signal the active real estate market in the location. Regarding distance from the CBD, the results show a decline in housing prices when moving outwardly from the CBD because of rising transport costs. This dependency was proved in many empirical sources, for instance, by Fujita&Thisee (2002) Glumac et al. (2019), Shimizu et al. (2017) and Combes et al. (2018).

Among the other qualitative factors, considering several types of housing (apartments, detached houses and chalets), on average, the most expensive dwellings can be found in cities, followed by chalets and detached houses. The notable price difference between the houses and chalets may seem odd, but it may manifest in current trends. Nowadays, weekend housing is becoming more attractive, so weekend houses in favourable locations have seen increased prices. Relatively low prices of detached houses result from the sampling; many represent obsolete houses, while mainly, the lot retains the value based on the location's attraction. Similar results were found by van Doorn et al. (2019) in major European cities where the urbanization trends result from demographic and technological changes. This situation leads to market crises due to decreasing affordability, driving many talented people out of major cities.

Furthermore, the presence of motorways in the region and the increasing urbanisation stimulate demand, pushing upward housing prices. This conclusion is quite reasonable; for instance, access to the motorway in the region means improving the technical infrastructure, which is associated with increasing estate prices. For instance, the southern and southeastern parts of Slovakia are mainly missing motorways, and in turn, housing prices are among the lowest in Slovakia. Naess (2006) and Combes et al. (2018) found similar conclusions about the physical improvements in regions and their link to real estate prices.

CONCLUSION

The study's topic was regional price differences in the housing estate market in Slovakia. For the study, a robust sample of dwellings was collected based on real estate agencies' public biddings. The housing price model was assembled considering both quantitative and qualitative factors affecting the house estate prices. The results pointed to a statistically significant relation between the price of a dwelling and local market supply (increase by 2 % per m2) and rising distance from the CBD (decrease by 1% per m2). Among the qualitative factors, the presence of the motorway in the region tends to increase the price of housing (by 20% per m2); among the types of housing, the most expensive are apartments, which are mostly located in cities, followed by the weekend houses (chalets) and detached houses (located mainly on the countryside). The study furthermore points to relatively big regional price differences in housing. There are stark differences based on the degree of urbanisation; the dwellings located in semi-urban areas (urban clusters – MK) recorded a 38,4% drop, and dwellings in the countryside had a 52,5% drop in the price compared to urban centres (MC). Highlighting the regional level (NUTS2), the differences are more modest; Central (Stredoslovenský) and Eastern (Východoslovenský) Slovakia regions are on the similar levels, both represent up to 40% drop in prices compared to Bratislava region. Western (Západoslovenský) Slovakia regions mark up to 20% price drop compared to Bratislava region.

This study is far from exhaustive; the analysis could, therefore, be extended to further model adjustments and gauging, for instance, employing the factor interactions or sample stratification to find more insights into regional housing conditions in Slovakia.

Housing affordability in Slovakia and the EU is currently one of the most pressing social challenges over time. The state should employ more effective tools for increasing access to adequate housing for selected social groups. Currently, the tools used (e.g., state-supported housing saving schemes, State Fund for Housing Development) have so far failed to stem housing price increases. Recently adopted, the new program “State-supported Rental Housing” aims to increase the supply of dwellings for social groups with difficult access to housing. However, the program is still in its infancy. In the past, such initiatives were plagued by bureaucracy and financial inefficiencies, which underscores the challenge of this topic.

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