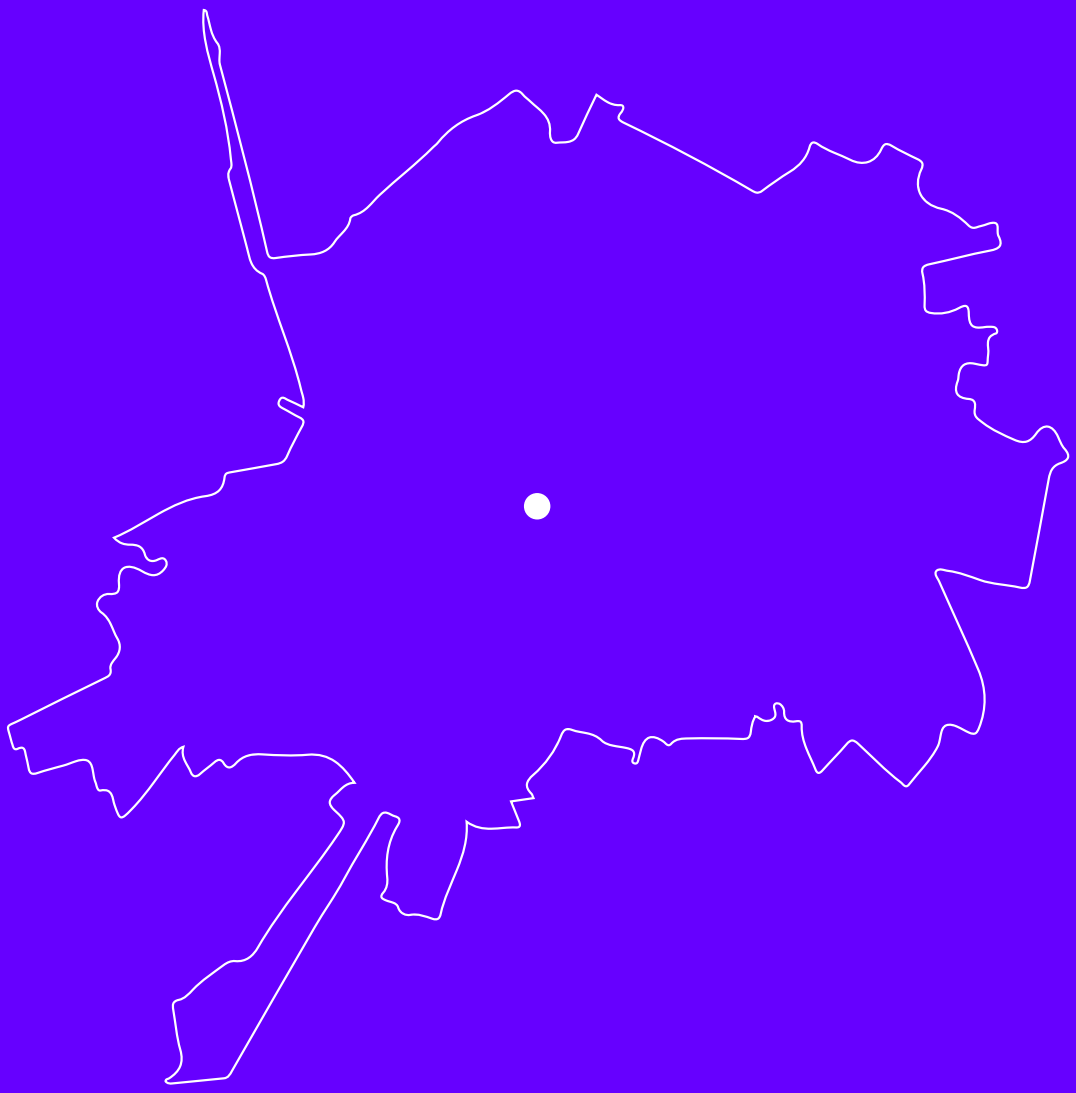
BRIGHT CITYSCAPES

ECONOMY IN TIMIȘOARA

Territorial distribution of the economy in the Timișoara Metropolitan Area



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ECONOMY IN TIMIȘOARA:

Territorial distribution of the economy
In the Timișoara Metropolitan Area

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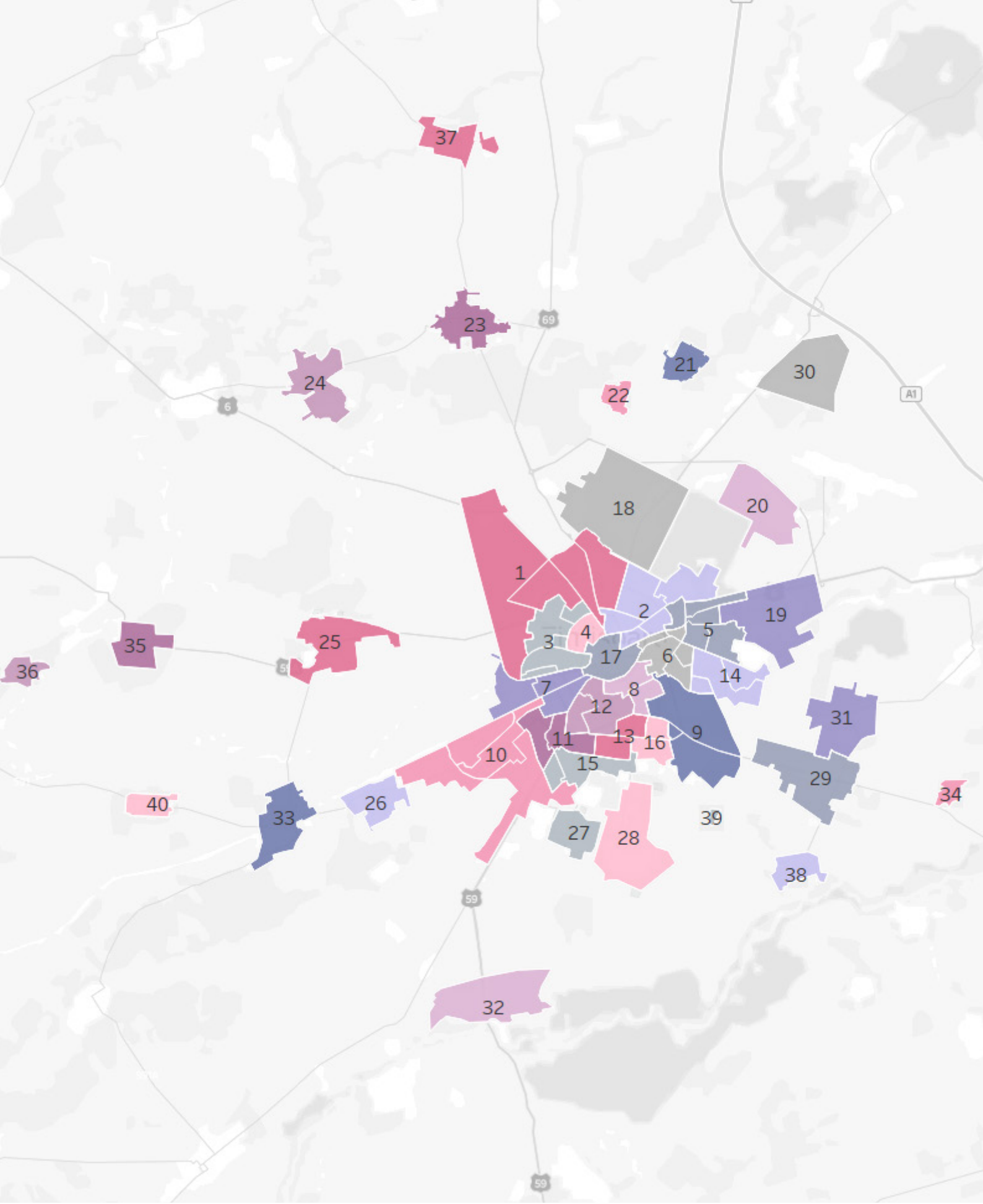
Table of contents

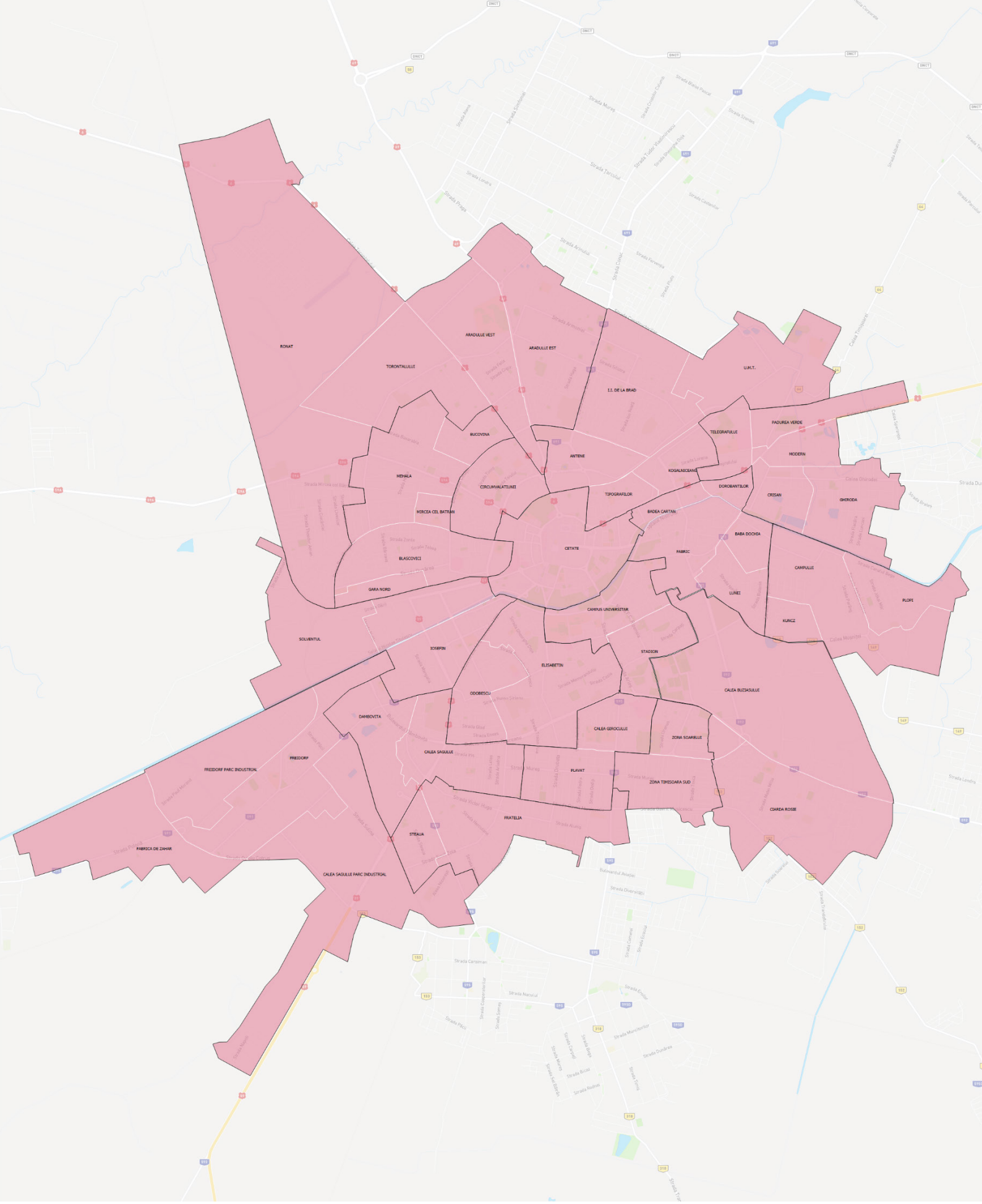
Territorial administrative units


37
23
69
24
6
21
30
22
A1
18
20
1
2
19
3
4
5
17
6
14
35
25
36
5
7
8
12
31
9
11
13
16
10
15
29
34
40
33
26
39
27
28
38
59
32
59

Districts

Districts

- Aradului Est, Aradului Vest, Ronat, Torontalului
- Antene, I.i. De La Brad, Kogalniceanu, Tipografilor, U.m.t.
- Blascovici, Bucovina, Gara Nord, Mehala, Mircea Cel Batran
- Circumvalatiunii
- Crisan, Ghiroda, Modern, Padurea Verde, Telegrafului
- Baba Dochia, Badea Cartan, Dorobantilor, Fabric, Lunei
- Iosefin, Solventul
- University Campus, Stadium
- Calea Buziasului, Ciarda Rosie
- Calea Sagului Industrial Park, Fabrica De Zahar, Freidorf, Freidorf Industrial
- Calea Sagului, Dambovita
- Elisabetin, Odobescu
- Calea Girocului, Plavat
- Field, Kuncz, Plopi
- Fratelia, Steaua
- Soarelui, Timișoara Sud
- Cetate
- Dumbravita
- Ghiroda
- Giarmata-Vii
- Cerneteaz
- Covaci
- Sanandrei
- Dudestii Noi
- Sacalaz
- Utvin
- Chisoda
- Giroc
- Mosnita Noua
- Giarmata
- Mosnita
- Sag
- Sanmihaiu roman
- Albina
- Beregsau mare
- Beregsau mic
- Carani
- Urseni
- Rudicica
- Sanmihaiu german



Neighborhoods of Timișoara

Summary

This comprehensive study delves into the economic history of Timișoara from different angles. The prewar era (1850-1910) marked the city's initial industrial growth, while the interwar period (1918-1940) saw interlinking of rural and urban areas through industrial investments. The socialist era (1950-1990) brought mechanisation and growth in agriculture and industry. Economic restructuring (1990-2020) attracted foreign investments and shifted migration patterns. Timișoara's economic structure (2022) revolves around manufacturing, services, and the automotive sector. The study also examines the role of foreign direct investments (FDI) in the economy and their impact on domestic companies, highlighting sector-specific trends and ownership networks.

PRE-WAR ERA (1850-1910)

The initial phase of industrial growth in Timișoara can be traced back to the annexation of Banat by the Habsburg Empire, with Count Mercy emerging as a pivotal political figure during his governorship from 1718 to 1734. Under his leadership, several factories were established on the city's outskirts, laying the groundwork for the city's industrial development.

With the establishment of the Austro-Hungarian Compromise, or dualist pact, Timișoara underwent significant transformations. The region benefited from a favourable economic climate, driven by robust agricultural productivity from the 1860s. This encouraged efforts to incentivize the industrial sector, leading to the establishment of new companies. Notably, milling experienced significant expansion due to Timișoara's advantageous geographical position.

However, optimism surrounding economic growth in the 1850s and 1860s was dampened by a severe crisis that struck the Austro-Hungarian Empire in 1873, leading to a substantial decline in Timișoara's industrial workforce. By 1881, the number of employed workers had significantly decreased from 8,639 to 5,017.

During the 1880s, the industrial sector experienced a resurgence, though it fell short of the previous economic peak. The 1890s marked a pivotal period, setting the stage for Timișoara's subsequent economic boom. Large companies gained momentum, aided by foreign investments as local capital was scarce. Governmental authorities at various levels played a significant role in encouraging industrial investment. Hungary implemented laws to stimulate industrial development, motivating local authorities to pursue their projects.

The shift in capital movements allowed local institutions more autonomy, spurring proactive roles in fostering regional economic development.

In 1900, Timișoara's population was up by approximately 141% compared to 1850, reaching nearly 50,000 inhabitants. The industrial sector was the primary employer, engaging around 9,100 individuals. By 1910, the 44 largest companies in Timișoara employed 6,051 workers, with a combined installed motive power of approximately 6,133 horsepower.

Timișoara's pre-war era marked a period of industrial growth, influenced by governmental policies across scales, favourable external circumstances, and foreign investments, leading to the city's emergence as a significant industrial centre in the Austro-Hungarian Empire.

INTER-WAR PERIOD (1918-1940)

The year of establishment of businesses in a city provides valuable insights into its development trajectory. In the case of Timișoara, around 23% of enterprises emerged before 1914, while the majority (approximately 66%) appeared during 1919-1930. The rest were either registered during the war or have undisclosed ages.

Excluding individual enterprises, Timișoara has the second-highest number of businesses after Bucharest. Out of this total, approximately 60% (222) are joint-stock companies, 24% (87) are partnerships, and 8% (30) are publicly owned enterprises. Timișoara ranks second after Bucharest in the number of joint-stock companies, followed by Cluj-Napoca, Oradea-Mare, Brașov, and Arad. The industrial sector comprises about 42% (93) of these companies, with manufacturing, clothing, food, textile, metallurgical, and chemical industries being dominant sub-sectors.

Regarding motive power, Timișoara ranks second nationally, with Bucharest in the lead. In terms of overall machine capacity, Timișoara is fourth, following Bucharest, Câmpina, and Reșita. Timișoara's industrial sector possesses a driving capacity of 28,149 horsepower, with 59% generated by the city's own plants.

At the national level, Timișoara ranks second in terms of total employed personnel, following Bucharest, with 23,178 individuals engaged in local businesses. Other urban areas with significant employment figures include Arad, Cluj, Ploiești, and Brașov. Within Timișoara, around 73% of the workforce is employed in the industrial sector, and 19% in commercial activities. The textile, clothing, metallurgy, and food industries have the highest number of employees.

Timișoara stands out nationally for its businesses with employee counts ranging between 51 and 100, as well as between 101 and 200, employing approximately 4,600 individuals. This indicates a strong presence of medium-sized enterprises in the city.

Timișoara's industrial growth and distribution of enterprises have positioned it as a prominent economic centre in Romania. Its substantial number of joint-stock companies and significant industrial capacity contribute to its economic prowess and employment opportunities for the local population.

SOCIALIST ERA (1950-1990)

The socialist era (1950-1990) in Romania brought significant social and economic changes, and Timiș County played a pivotal role in the country's industrialization and agricultural development. Petrovici's indices were used to assess the impact of socialist investments in different regions and economic activities. Timișoara received substantial agricultural investments due to its geographical advantages, and while it also saw investments in various manufacturing branches, they were somewhat concentrated compared to Bucharest.

Over the years, the total number of employees in Timiș County increased, with notable changes in the proportion of blue-collar and white-collar workers. The formation of cooperatives led to increased agricultural productivity and modernization of production methods, making Timiș County a leader in the agricultural industry. The industry sector also experienced growth, with an increasing proportion of employees over the years.

The investment strategies in Timiș County evolved over time, with a shift towards industry and agriculture investment in later years. The highest total amount of investments occurred during the seventh five-year plan (1981-85). The services sector also received a significant portion of investments, particularly in communal households and collective housing.

The historical variation in investment and manufacturing branches is linked to the larger national socialist context. Timișoara experienced socialist investment in manufacturing during three distinct periods: 1948-1955, 1965-1980, and the 1980s. These investments aimed to refurbish and expand productive capacities, build new factories, and focus on the chemical industry as a driver of economic growth.

Migration patterns during this era saw three waves, including rural-urban migration and inter-regional movements. Timiș County recruited labour from adjacent Western counties and Transylvania. The migration patterns were influenced by economic and political factors such as industrialization, collectivization, and foreign loans.

The socialist era in Timișoara marked a significant period of growth and transformation in both industry and agriculture. The county's strategic geographic position, coupled with targeted investments, contributed to its economic development and productivity. The changes in employment patterns and migration further shaped the region's economic landscape during this era.

ECONOMIC RESTRUCTURING (1990-2020)

Economic restructuring (1990-2020) in Eastern Europe was marked by significant population decline and a decrease in overall employment levels. Romania, like other countries in the region, experienced a dramatic reduction in the number of wage earners. In the 2000s, migration patterns shifted towards Western Europe, where Romanians sought low-paying jobs in both formal and informal secondary markets. International migration intensified after Romania's accession to the European Union and the 2008 crisis.

Timiș County played a crucial role in receiving industrial investments that continued the tradition of interlinking rural and urban areas, creating strong networks of interconnected industries. The failure of some supply chains in the post-1990s era highlighted the importance of economic policies and supply chain integration. Since 1997, the proportion of Romanian employees working in companies owned by foreign investors steadily increased, with Timiș County standing out as the highest recipient of foreign direct investments (FDI) outside of the capital and its surrounding regions.

Between 2011 and 2020, Bucharest and Cluj emerged as primary beneficiaries of FDI in the business services sector, with Timișoara ranking third. The Timișoara Metropolitan Area showed impressive turnover, dominated by the industrial sector, especially the automotive sector. Timiș consistently outperformed other regions in export performance, with a high export-to-GDP ratio, indicating a significant contribution of exports to its GDP.

Despite experiencing a decline in FDI in recent years, Timiș remained among the top FDI destinations in Romania outside of the capital. The county's economic restructuring and attractiveness to foreign investors have contributed to its prominence in the Romanian economy. Timiș, in terms of export performance, consistently outperformed other regions, with the highest export-to-GDP ratio in all years except for product trade in 2021. This indicates that a significant portion of Timiș's GDP comes from exports. While Timiș ranks third in terms of the euro value of exports, it trails only behind Bucharest and Ilfov. Timiș is ranked third after Bucharest and Ilfov in terms of destination of FDI in the period of 2013-2021. The proportion of FDI in Timiș has ranged between 5.01% in 2021 and 5.62% in 2017.

Economic restructuring from 1990 to 2020 saw Timiș County emerge as a significant player in attracting industrial investments and foreign direct investments. The region's integration of rural agricultural production with urban industrial circuits and its strong export performance have played key roles in its economic development. Although facing challenges, Timiș continues to be a major destination for foreign investors, solidifying its position in the Romanian economy.

LABOUR MIGRATION AND COMMUTING (1990-2021)

The population of Timișoara is evenly divided between natives and internal migrants (48%). Among the immigrant population, one-fourth originates from within the Timiș region. Another one-fourth comes from adjacent counties, while 19% originate from the second ring of counties. Notably, a significant proportion of immigrants, accounting for approximately one in every three persons, originate from more distant parts of Romania.

A notable trend, especially from 2002 onwards, is the increasing number of urban and educated immigrants in Timișoara. This trend is particularly pronounced among those coming from neighbouring regions, who tend to be well-educated urban individuals with at least a high school education. As the influx of rural workers diminishes, the composition of long-distance immigrants has shifted towards young urban populations who enrol in university programs in Timișoara. After completing their studies, this population chooses to settle in the city, drawn by the expanding labour markets that provide employment opportunities for graduates.

The population of the metropolitan municipalities of Greater Timișoara is evenly divided between native residents and domestic immigrants (the last category comprising 46% of the total population). Notably, approximately 42% of the migrant population originates from the city of Timișoara itself, while an additional 14% comes from other municipalities within Timiș County.

Population dynamics in Timișoara exhibit a strong correlation with the fluctuations in the local labour market. From 2008 to 2022, Timișoara experienced a population decline of approximately 20,000 residents, while the surrounding metropolitan municipalities witnessed a notable increase of around 62,000 inhabitants. This equates to a relative decrease of about 6% in Timișoara's population, contrasted by a 9% increase in the metropolitan area, primarily concentrated in the municipalities of the first ring.

A noteworthy point is that a quarter (25%) of employees reside in municipalities outside of Timiș County. This observation highlights a strong statistical association between higher education and having a legal residence outside of Timiș, as individuals who migrate from greater distances tend to have more years of education on average and typically maintain their original legal residence.

The 2011 census reveals that Timișoara had a significant proportion of its university graduate employees (18%) working in manufacturing, whereas Iași and Cluj had a lower percentage (10% and 9% respectively).

ECONOMIC STRUCTURE (2022)

According to the 2022 Labour Force Survey conducted by the National Institute of Statistics, Timiș County ranks second in Romania in terms of labour resources, trailing only behind Bucharest, with a workforce of 476,000 individuals. The statistical category of 'labour resources' encompasses not only the

population of working age who are capable of employment, but also includes individuals both below and above the working age who are actively engaged in work. Of this demographic, 261,000 are salaried employees, constituting 55% of the workforce; 9,700 are employers, making up 2%; and 51,200 are self-employed or unpaid family workers, accounting for 11%. As a result, 68% of the labour resources in Timiș County are actively engaged in work. This places the region third in Romania for labour force utilisation, exceeded only by Bucharest and the Cluj region.

The unique economic profile of the Timișoara Metropolitan Area is primarily characterised by its combination of economic resources, with a focus on the manufacturing industry and, to a lesser extent, commercial services. This sets it apart not only from the national economy but also from other metropolitan areas centred around urban growth poles in Romania.

The highest number of salaried workers is found in the municipality of Timișoara, largely due to the presence of numerous companies and institutions headquartered there. Most employees in Timișoara are working in services and industry, with a significant portion working in the automotive sector.

Other municipalities in Greater Timișoara also contribute to the region's employment. Sânandrei, for example, accommodates employees primarily in the industrial area, working at Artemis Industrial Park, Ipso Timișoara, B. Braun Pharmaceuticals, or Simultan. Giroc is also a significant contributor to employment, with labourers mainly employed within the Incontro Industrial Park in Chișoda. Dumbrăvița plays a crucial role in the employment landscape, housing employers in specialised economic sectors like logistics and transport. Ghiroda, along with the component village of Giarmata, also counts among the municipalities with the highest number of employees in Greater Timișoara. The automotive industry is the primary employer in Ghiroda, represented by companies such as Hella Electronics and Akwel.

Timișoara stands out in terms of the number of managers and specialists it hosts. Despite its size relative to the national population, Timișoara concentrates around 3% of the total number of managers and 4% of specialists in the country.

The industrial sector holds a significant share in Timișoara's Metro Area economy, contributing 43% of the turnover in 2020 and ranking as the second largest field after services. The manufacturing industry subsector plays a dominant role in positioning Timișoara's economic profile, comparable to Iași, Brașov, Oradea, and Ploiești. Timișoara and Craiova exhibit lower values for the construction sector, indicating that Greater Timișoara's development primarily centres around metropolitan areas rather than the city itself.

OWNERSHIP NETWORKS

The Central and Eastern Europe (CEE) region occupies a unique position globally, Timișoara being no exception, acting as a key facilitator of the cost competitiveness of West European-centric global value chains, compared to their global rivals, mostly from Asian regions (Éltető and Medve-Bálint, 2023; Ban and Adăscăliței, 2022).

Our findings suggest limited horizontal spill-over of Foreign Direct Investment into the domestic economy of Timișoara, even though FDI companies, being larger in terms of turnover and employees, are more likely to expand within the same sector by forming new companies within the region or at the national level (as indicated by the logistic regression results showing a prevalence in tradable sectors like electrical and electronics, chemicals, real estate, automotive, clothing & textiles, and IT&C).

Domestic capital is more prevalent in non-tradable sectors like education, sports, and medical. FDI companies have a higher likelihood of forming ownership ties compared to domestic companies, but these ties are primarily intra-sectorial.

FDI companies constitute a significant portion (16%) of the entire network of companies, and they have a notable impact on the economy as they employ 54% of the total workforce and contribute to 74% of the aggregated turnover in Timiș, amounting to €15.32 billion.

The sectoral distribution of companies in the entire network reveals a dominant presence of the services sector, accounting for 42% of all companies, followed by the industry sector at 30%, trade & logistics at 21%, and agriculture at 7%. However, when focusing solely on the top 1000 companies, the industrial sector takes the lead with 42% representation, and services come in second with 28%.

Our analysis demonstrates that while FDI-companies dominate key economic sectors with advanced technologies, the financial sector and medical companies stand out as examples of how domestic and foreign elements coexist in Romania's investment landscape, contributing to its economic growth. Specifically, FDI-companies hold significant sway in crucial economic branches such as electrical and electronics, chemical, real estate, automotive, textile, and IT&C. Interestingly, apart from IT&C and real estate closely tied to business services, these sectors primarily operate within the sphere of manufacturing outsourcing.

The results revealed that domestic companies were less likely to form ownership ties compared to FDI companies. Domestic companies seem to have lower levels of tie formation, potentially indicating differences in their networking strategies or access to resources. In contrast, FDI companies exhibit a higher propensity to form ties, particularly with other FDI companies, potentially indicating a preference for collaboration within their own network.

Companies with medium and low technical levels have a lower propensity to form ownership ties, while those with a medium technical level may have a

slightly higher likelihood of tie formation. The results indicated significant effects of technical level on tie formation.

The Pre-War economy of Timișoara, 1850-1910

Transformative Journey of Timișoara's Pre-War Economy: From Industrial Growth to Export Hub

This chapter provides a historical examination of Timișoara's pre-war economy in România between 1850 and 1910, with a specific focus on its transformative journey during the mid-19th century. Initially driven by Count Mercy, the city's industrial growth was marked by the establishment of factories, including silk, wire, and iron processing workshops. Following the dualist pact, the industrial landscape underwent significant changes, with efforts to incentivize the sector. The text explores sectors that witnessed growth, such as milling, spirits, and beer production. However, the economic crisis of the 1870s impacted Timișoara's industries, leading to a decline in various sectors. Nonetheless, in the subsequent post-crisis decades it witnessed some recovery, and the 1890s saw a surge of foreign investments fuelling industrialization. By the 1900s, Timișoara emerged as a leading urban centre, known as the "Magyar Manchester," with a specialised workforce and an expanding export sector in textiles, leather products, and shoes. These developments solidified the city's position as a prominent industrial hub in the region.

The transformative journey of the mid 19th century

The initial phase of industrial growth can be traced back to the annexation of Banat by the Habsburg Empire. Count Mercy, who served as the governor of Banat from 1718 to 1734, emerged as a pivotal political figure. Under his leadership, several factories were established, predominantly located on the city's outskirts. Noteworthy among these were the silk factory, the wire factory, oil presses, and iron processing workshops (Berkeszi, 1900).

With the establishment of the dualist pact, the industrial landscape of Timișoara underwent significant transformations. Benefiting from a favourable economic climate propelled by robust agricultural productivity from the 1860s, concerted efforts were undertaken to incentivize the industrial sector, leading to the establishment of several new companies.

One of the sectors that witnessed significant expansion in the preceding decade was milling, which flourished in Timișoara due to its advantageous geographical position. This surge in production was closely linked to the technological advancements of existing mills, primarily driven by the adoption of motorised traction in place of traditional animal-driven methods. Notably, the advent of motorised mills began with the establishment of the oldest such mill in 1863, employing a workforce of 90 individuals. Subsequently, in 1869, the *Pannonia* mill was founded, equipped with a steam engine, and employing 55 workers. Flour production in this context emerged as the foremost industry to experience widespread proliferation across the Hungarian state. This development can be attributed to Hungary's predominantly agrarian character and its critical role as the principal grain exporter, serving as the primary supplier to Austrian territories.

During that period, another prominent sector was the manufacture of spirits, exemplified by the establishment of the Blau brothers' distillery in 1862. Subsequently, a larger distillery was founded in 1870 in the form of a joint-stock company. Additionally, beer production also boasted a longstanding tradition within the local industry, as evidenced by the establishment of a new brewery in 1869 as a joint-stock company with a share capital of HUF 1,800,000. Notably, until the outbreak of the First World War, the food processing sector maintained its status as Hungary's predominant manufacturing industry. Particularly in the late 1870s, significant expansion was observed, evident through increased sugar production and flour milling. These developments underscored the region's growing economic dynamism and its capacity for industrial growth during that era.

The tobacco factory in Timișoara held a prominent position in terms of size, ranking second in the Hungarian state, only surpassed by the factory in the city of Fiume (present-day Rijeka). Its operations commenced in 1848 as a privately-owned enterprise, operating under the name "Tobacco Mill," primarily engaged in producing tobacco "dust" for plug tobacco, as well as tobacco for pipe smoking and cigarette making. However, with the establishment of the

tobacco monopoly in the Austro-Hungarian Empire in 1851, the mill underwent a transformation, being taken over by the state and reconfigured into a factory. To secure the necessary raw materials, domestic tobacco sources were initially utilised. However, with the increasing popularity of leaf cigarettes, the factory began importing tobacco from various regions, including Brazil, Puerto Rico, Cuba, and Southeast Asia. This shift in raw material procurement reflected the changing market demands and the factory's adaptation to evolving consumer preferences.

The economic crisis of the 1870s: The economic collapse

From a demographic standpoint, Timișoara underwent rapid growth in the second half of the 19th century, coinciding with the implementation of a process aimed at Hungarianization of the local population, which was initiated after the events of 1848. This resulted in a substantial increase in the city's population over this period. In 1851, Timișoara's population was recorded at approximately 20,560 inhabitants. However, the optimism surrounding the economic growth in the 1850s and 1860s was dampened by a severe crisis that struck the Austro-Hungarian Empire in 1873, leaving lasting repercussions that reverberated throughout the subsequent decade. The economic crisis dealt a significant blow to Timișoara, leading to a substantial decline in the industrial workforce.

In 1870, there were 8,639 individuals engaged in industrial production, but by 1881, this number decreased to 5,017, with the most significant decrease seen in the number of employed workers. The repercussions of the recession were evident in the closure of several factories, including those involved in paper, silk, oil, candle, sawmill, soap, starch, chemical, and brick production. The fluctuation in the number of industrial employees was largely influenced by the economic crisis of 1873 and its lingering repercussions.

Notably, the waistcoat industry saw a notable decline in the number of self-employed workers, as evidenced by a significant drop from 81 producers in 1853 to only 23 remaining in 1891. A similar trend can be observed in various sectors associated with clothing and textile materials, as well as in certain branches like candle and soap making, and weaving. This decline warrants examination from the perspective of changes in the organisation of work processes, impacted by the emergence of new goods produced on an industrial scale. The shift towards industrial production methods may have contributed to the diminishing presence of traditional self-employed artisans in these sectors.

The repercussions of the crisis persisted for an extended period, resulting in a decade-long absence of significant-sized operational companies, with the Erzsébet Mill being a notable exception. This is due to a significant reconfiguration of the local economy. During this period, the emergence of new industrial branches was evident, with the establishment of companies belonging to the metallurgical industry being a noteworthy development.

Despite the emergence of new enterprises and a period of economic growth observed at the level of the Hungarian state, these developments were insufficient to fully offset the repercussions of the crisis, including the bankruptcies faced during that period and the challenges endured by the spirits industry. Timișoara's economic resurgence faced challenges in the subsequent decade as well, attributable to fluctuations experienced by the spirits industry, a key sector impacted by the 1870s crisis. Despite efforts, such as the

implementation of the 1884 Spirit Tax Act, this sector experienced a significant decline following the crisis.

The crisis brought about a decline in day labour and an increased demand for long-term labourers, signalling a shift towards new contractual arrangements and changes in prevailing labour practices. Furthermore, there was an expansion of long-term labourers in trade, credit services, and public services during this period, likely as an anti-cyclical measure. However, day labourers still held significance, as the number of factory employees remained relatively adaptable, depending on order volumes and seasonal fluctuations.

The 1880s post-crisis growth: the fluctuating economy

During the 1880s, the industrial sector in Timișoara experienced a resurgence, though its development fell short of the peak achieved in the previous economic cycle, resulting in the city's economic growth remaining below the levels attained during the previous phase of prosperity. Signs of recovery in the Timișoara economy only became evident in the subsequent decade, the 1890s. Until then, its recovery was inconsistent, particularly seen in the number of industrial employees, which failed to reach the same levels as during the period of expansion around the adoption of the dualist pact.

Nonetheless, in the post-crisis 1880s, the industrial sector emerged as the dominant employer in the Timișoara region, but its development displayed fluctuations and distinct patterns. While primary production experienced modest growth, the manufacturing sector and factory industry did not witness significant expansion in the 1880s, and some enterprises had to close down.

Traditional craft-based work organisations gave way to the rise of factories with technologically driven production, leading to a significant increase in the industrial workforce. Consequently, industries reliant on traditional forms of labour, such as clothing, textile processing, and leatherworking (including shoe production), experienced a decline as the new industrial workforce emerged. Notably, this specific transformation marked the period as an era of proletarianization in certain sectors.

Nonetheless, the city witnessed expansion in specific branches of the industrial sector, such as the food industry and construction, indicating signs of economic recovery. Advancements became possible through the import of new technologies, enabling the establishment of an asphalt factory and an industrial machines factory in the region. Substantial growth in the cement and construction materials industry also contributed to the region's industrial progress, indicating a shift towards modernization and innovation in the local industrial landscape. Furthermore, certain existing sub-sectors experienced expansion, exemplified by the growth in brick and tile production.

Additionally, two new factories were established, one for felt and another for matches. The latter, founded by Mr. Károly Steiner in 1883, initially focused on the import of matches and boxes. However, over time, its operations grew in complexity, with a shift towards internal production, gradually replacing the imported goods. Notably, one of Hungary's strategic objectives during this era was precisely to substitute imported manufactured products with domestically produced alternatives The development of a robust building materials industry played a pivotal role in advancing the urban centre's growth and prosperity, contributing significantly to the modernization of the city's landscape, and laying the groundwork for its status as a thriving industrial hub in the 1890s.

In the 1880s, activities now classified as contemporary services were part of the industrial sector, specifically under personal service industries. This

included carpentry, baking, metallurgical specialties like blacksmiths and locksmiths, tailoring, barbershops, hospitality, and other trades catering to the population's needs. Steady growth in personal services indicated urban affluence and status, implying an increasing level of affluence. This growth also suggests that the decline in certain branches, like the textile industry, was influenced not only by local factors but also by broader economic shifts.

The long 1890s: the decade of FDI-led industrialization

The 1890s marked a pivotal period that set the stage for the subsequent economic boom in Timișoara's industry during the first decade of the 20th century. During this time, the establishment of large companies gained momentum, and this development was bolstered by foreign investments, as local capital was lacking. The confluence of enduring internal factors, including the policies pursued by the local government, and favourable external circumstances created an environment conducive to attracting foreign investments and fostering economic growth. This ethos of seeking foreign investments was shaped by a combination of factors. On the one hand, lasting internal conditions and local policies played a significant role in encouraging such initiatives. On the other hand, the city was able to capitalise on favourable external circumstances, which further facilitated its economic progress. This confluence of factors propelled Timișoara towards a period of remarkable industrial expansion and prosperity in the early 20th century.

The strategic geographical location of Timișoara played a pivotal role in aligning with the Hungarian economic policy of becoming a leading exporter of manufactured goods in the Balkans. This advantageous positioning was reflected in the operations of several significant local economic entities, which primarily directed their exports towards countries such as Romania, Bulgaria, Bosnia, and even Turkey. Timișoara's proximity to these markets facilitated efficient trade and enhanced its position as a key player in the regional economic landscape, contributing to the city's prominence as a centre for manufacturing and trade during that period.

Foreign capital shifted its focus from financing large-scale infrastructure projects to developing a regional railway system, contributing to Timișoara's elevation as a genuine regional centre. The well-developed railway network connected the city to various localities with diverse roles in the Hungarian economy and other state structures, enhancing economic interactions and trade.

In 1891, Timișoara ranked behind only Bratislava and Kosice in terms of the number of employees in large companies among cities of similar size based on domestic production. Notably, the tobacco processing factory played a crucial role in providing this advantage, employing a substantial workforce. Despite lacking the same level of diversification seen in Bratislava's industrial sector, efforts were made to address this limitation, as evidenced by the opening of new factories in Timișoara, including a hat factory, a weaving facility, and a felt factory.

During this period, Timișoara demonstrated a relative degree of complementarity with Arad's industrial sector, facilitating regional economic cooperation between the two cities. The last decade witnessed a significant upswing, breaking the pattern of alternating periods of decline and stagnation that followed the crisis of 1873. Notably, the revival of the state railway workshop in

1892 and other positive developments led to a noteworthy advancement in the city's industrial sector.

Timișoara boasted a significant local infrastructure, making it an attractive destination for companies seeking to relocate their operations. One crucial component of this infrastructure was the electrical plant, capable of providing electricity to support the technological needs of various production processes.

On January 1, 1893, the *electrical plant* came under the ownership of the municipality and was officially named "*Uzina Electrică a orașului Timișoara*". Notably, unlike other city entities, the plant was registered as a commercial firm and operated based on commercial principles. The successful transition of the electrical plant into municipal ownership was met with great acclaim, prompting the municipal council to consider municipalizing other units as well. Moreover, in 1908, the construction of a hydroelectric plant commenced, reflecting the city's commitment to expanding its infrastructure and bolstering its position as a centre of industrial and technological advancement. These developments underscored the city's progressive approach to enhancing its supportive environment for businesses and industries during that period.

Another significant aspect pertaining to the local infrastructure was the *tramway service*, which held a pivotal role in fostering the development of the local industry by establishing a necessary transportation network for both people and commercial goods. The electrification of the tram service commenced on July 27, 1899. Comparing the year 1898, when the horse-drawn system was still in use, to a decade later, the number of passengers had surged more than sixfold, while the receipts witnessed a notable increase of 234%. Subsequently, in 1908, the company was taken over by the state, becoming state property.

The democratisation of access to the *railway system* had significant repercussions on the economy, highlighting ethno-linguistic heterogeneity and factors with national implications. The formation of ethno-linguistic networks played a dual role, facilitating economic exchanges within these networks but also limiting interactions with non-network members, leading to distinct spaces and informal lines of demarcation known as the "border effect."

The city administration cooperated closely with the Chamber of Commerce and Industry to implement an ambitious project aimed at attracting investments. As an active participant, the Chamber provided support to students from various schools through a scholarship program, enabling them to pursue studies in disciplines such as locksmithing, tinsmithing, carpentry, or printing. This initiative was instrumental in fostering a skilled workforce and encouraging industrial development in the city. Remarkably, the Chamber of Commerce and Industry allocated a substantial portion of its budget, amounting to nearly one-third, to aid in both industrial endeavours and educational initiatives.

The local workforce in Timișoara exhibited a notable level of specialisation, distinguishing it from other regions. A key contributing factor to this phenomenon was the city's technical and industrial education that was put up in the 1850s, which facilitated the training of young individuals in various specialised fields over an extended period.

Moreover, the local state also played a crucial role in nurturing skilled workers. To this end, it established a school dedicated to training apprentices in furniture production and other woodworking trades, thus further promoting the development of a highly skilled labour force in the city.

Consequently, the local population served as a valuable resource for investors, rendering Timișoara an attractive destination for industrial development. The size of the domestic population played a crucial role in motivating the choice of the city as a centre for industrial growth. Notably, contemporary authors noted that foreign investors highly valued Timișoara's German-speaking population. This factor held particular significance as many entrepreneurs hailed from regions beyond the borders of the Hungarian state, and the recruitment of senior administrative personnel was not confined solely to the local level.

The economic policy pursued by governmental authorities at various levels, both national and local, played a significant role in encouraging investment in the industrial sector. Hungary, from 1881 onward, implemented a series of laws aimed at stimulating industrial development, with the aim of narrowing the gap with the Austrian territories within the Empire.

These measures encompassed various forms of subsidies for industrial enterprises, ranging from tax exemptions to land concessions, while monetary assistance was less commonly provided. The overarching objective of Hungary's industrial promotion was to replace imports on the domestic market, leading to a conflict with Austrian producers, whose primary export market lay in the territories controlled by the Hungarians.

The allocation of subsidies was not uniform; certain industries, such as the textile sector, received disproportionate direct aid in 1881 compared to others. This led to an increase in cotton production in subsequent years. Moreover, the chronological development of various industrial branches varied. While Bratislava already had a significant textile sector by 1891, the establishment of considerable-sized textile companies in Timișoara commenced in the latter half of the decade and continued into the early 20th century.

These measures necessitated complementary efforts from local authorities, as the subsidies alone did not yield a sustained and widespread impact on the industrialization process within the Hungarian state. The engagement of local governments was further motivated by a broader shift in capital movements. Towards the end of the 19th century, there was a growing interest in financing activities at the municipal level, not solely at the national level. Consequently, local institutions gained a degree of autonomy and were spurred to initiate and develop their own projects. This shift in capital movement provided local authorities with an opportunity to take on more proactive roles in fostering economic development within their respective regions.

One of the initial events that underscored the local interests in fostering the development of the industrial sector at the regional level was the Industrial and Agricultural Exhibition of 1891. This event played a pivotal role in furthering the growth of the manufacturing industry within the locality. The exhibition garnered significant success and even attracted the presence of the emperor,

drawing attention from potential investors towards Timișoara as a promising area for economic expansion and development.

The city authorities offered various forms of support to incentivize industrial development, including assistance with construction materials and tax exemptions. Furthermore, the connection to the local electricity network, facilitated by the municipal plant, effectively reduced costs for investors. Employees of the newly established companies were also granted subsidies, receiving an exemption of 10 crowns per year. Additionally, the expansion and enhancement of the local infrastructure broadened access to new labour pools, contributing to the city's overall growth and progress in the industrial sector.

The glorious 1900s: Timișoara as the "Magyar Manchester"

By 1900, Timișoara had undergone a significant economic transformation, particularly in terms of industrial modernization. These developments propelled the city to become the leading urban centre in Southern Hungary during the early 20th century, earning it the nickname Magyar Manchester (Lendvai, 1908:3). Timișoara of 1900 witnessed a remarkable population surge of approximately 141% compared with 1850, reaching an estimated figure of almost 50,000 inhabitants. The most striking growth occurred during the final decade of the 19th century, with the population rising by approximately 10,000 inhabitants within a mere ten-year span.

The 1900 population registration census yielded valuable insights into the occupational makeup of Timișoara's inhabitants, shedding light on the connection between income earners and their dependents, presumably other family members. According to the data, the industrial sector stood as the most significant employer, with around 9,100 individuals engaged in various industrial activities. Additionally, approximately 2,350 people were involved in commerce and credit-related pursuits. A noteworthy observation was the gender representation, with 2,624 women among the total number of employees, and the industrial sector had the highest concentration of female workers.

In terms of the distribution of the employed population across various economic sectors, Timișoara exhibited distinct proportions in the year 1891. The city's workforce was divided into different sectors, with approximately 25.43% of the total population engaged in industry, trade, credit, and transport combined. Within this figure, 19.15% were employed in the industrial sector, 4.14% in trade, 0.29% in credit-related activities, and 1.84% in shipping.

The proportion of industrial workers among all employees in Timișoara was similar to neighbouring cities such as Arad (23.18%), Oradea (25.14%), and Cluj (24.30%) in these three sectors. However, Timișoara had a lower percentage of industrial workers compared to urban centres like Kosice and Bratislava. An interesting observation was the inverse relationship between the number of employees in the industrial sector and those in commerce. This was due to the level of locally produced goods. When there wasn't enough local manufacturing capacity, the city had to rely on acquiring commodities from the market, resulting in the expansion of commercial activity.

In proportional terms, the transport sector witnessed a noteworthy surge in the number of employees, experiencing an increase of nearly 50%. This development can be linked to the electrification and expansion of the tram service, which commenced at the end of the 19th century. Moreover, the reopening of the Hungarian State Railways workshop at the turn of the century played a pivotal role in this escalation, ultimately providing employment opportunities for over 500 individuals.

Other notable segments within the workforce included individuals employed in protection services (3,409) and day labourers and farm employees (3,043). Notably, the number of day labourers saw a significant decline over a ten-year period beginning in 1890, with approximately 1,100 fewer people engaged in such work.

The 1910s: the growing export sector

In 1910, the 44 largest companies in Timișoara provided employment to a total of 6,051 workers, with peak production requiring up to 6,776 employees. This data includes both permanent employees, including apprentices, and additional temporary workers hired during periods of high production demand. The combined installed motive power of these enterprises, calculated based on the engines they utilised, amounted to approximately 6,133 horsepower.

The companies in Timișoara demonstrated a flexible approach to production, readily hiring workers as needed without necessarily offering permanent employment. In 1899, a new hat factory was established in the city, followed by the Turul shoe factory the following year. In the subsequent decade, the city witnessed the emergence of a cotton yarn factory in 1905, funded by Austrian capital, a wool yarn factory in 1906, with half of its capital coming from foreign sources, a new fine leather industry in 1908, established by a Belgian company, and a factory producing knitted and woven goods in 1907.

The sectors specialising in intermediate goods were more actively engaged in international trade compared to others. Specifically, companies based in Timișoara played a significant role in exporting textile and leather products.

The First Hungarian *Wool Yarn Factory* operated in the production of pure wool yarn, weaving, and knitting yarn, employing a workforce that typically ranged from 180 to 250 employees. The factory boasted six engines with a combined power of 165 horsepower and two electric generators with 250 horsepower. Its market reach extended beyond Hungary, as it exported its products to Austria, Romania, Bulgaria, Bosnia and Herzegovina, and Turkey.

Gyula's first industrial knitted and woven products factory specialised in producing socks and other cotton goods. With a stable workforce of 300 employees, the factory operated seven 16-horsepower engines and one 120-horsepower steam engine. Its exports included destinations in Austria and Bosnia and Herzegovina.

The *Turul Shoe Factory* focused on manufacturing shoes, nails, and sewn products and maintained a consistent workforce of 900 employees. Equipped with two primary engines of 280 horsepower each and an additional secondary engine, the factory exported its products to various countries, including England, Switzerland, Austria, Serbia, and Germany.

Nevertheless, there were producers of final goods that were also significant exporters. However, these companies targeted specific and specialised foreign markets.

The First Hungarian *Monetary Cabinet and Machine Factory*, led by Anheuer János, specialised in manufacturing cabinets and mechanical cabinets for storing money, along with asbestos-lined filing cabinets. The company's exports extended to the Balkans and the United States of America.

Weisz Lipót and Partners Brick and Stove Factory focused on the production of bricks, terracotta stoves, garden decorations, sculptures, and air heaters. The company employed 25 full-time workers, which could increase to 55 during periods of heightened demand. It operated a 25 HP engine and exported its products to Turkey and Austria. Notably, it was the sole enterprise in this domain that engaged in export activities.

The Interwar Economy of Timișoara (1918-1948)

Business Establishment and Technological Advancements

This section presents an analysis of the interwar economy in Timișoara, between 1918 and 1948, focusing on the establishment of business operations, legal structures of enterprises, technological advancements, and the size of the workforce. Utilising data from the 1930 industrial census, the study examines various aspects of the local economy. Timișoara's economy witnessed significant growth during this period, with most enterprises established between 1919 and 1930, particularly in the industrial sector. Joint-stock companies and industrial enterprises dominated the business landscape, signifying the city's economic development. The analysis also reveals the technological advancements in various industries, with Timișoara ranked second nationally in terms of motive power generated by industrial units. Moreover, the city's workforce was predominantly engaged in the industrial sector, with significant employment in the textile, food, and metallurgical industries. The findings shed light on Timișoara's dynamic economic landscape during the interwar period.

Years of establishment of business operations

The industrial census of 1930 encompasses data pertaining to enterprises of various types (industrial, commercial, credit, and others) at different geographical scales. The volume commences with an introduction by Sabin Manuilă, the coordinator of the review project, which provides an overview of the contemporary situation and the preceding developments up until that point. The collected data cover aspects such as the legal structure of enterprises, the establishment period of each enterprise, the generated driving force at the enterprise level, and the personnel count or structure.

These recorded values are subsequently reproduced at the national, regional, and county levels, corresponding to the territorial-administrative organisation of the relevant period, as well as at the locality level. For the cities, a selection of 30 localities is made at the national level, encompassing all regions except for the southern part of the country, which is presently part of Bulgaria.

The initial tabular data set includes information regarding the age of enterprises at the locality level and their legal forms, categorised according to the economic sector to which they belong. Subsequently, the internal distribution within each sector is presented, allowing for the observation of economic specifics at the locality level.

The company's year of establishment of business operation at the locality level serves as an indication of potential developments within specific time intervals and facilitates the understanding of the trajectory taken by a city. In the case of Timișoara, approximately 23% of enterprises emerged before 1914, while the majority (approximately 66%) appeared during the period of 1919-1930. The remaining enterprises were either registered during the war or have not declared their age. Within the economic branches, the industrial sector constitutes half of the enterprises established in each period. Moreover, when considering the establishment patterns of enterprises across the three-time intervals, a continuity is observed, with industrial activities predominating at the city level. Consequently, the sub-sectors with the highest number of enterprises before 1914 demonstrate similar growth rates in the 1919-1930 period.

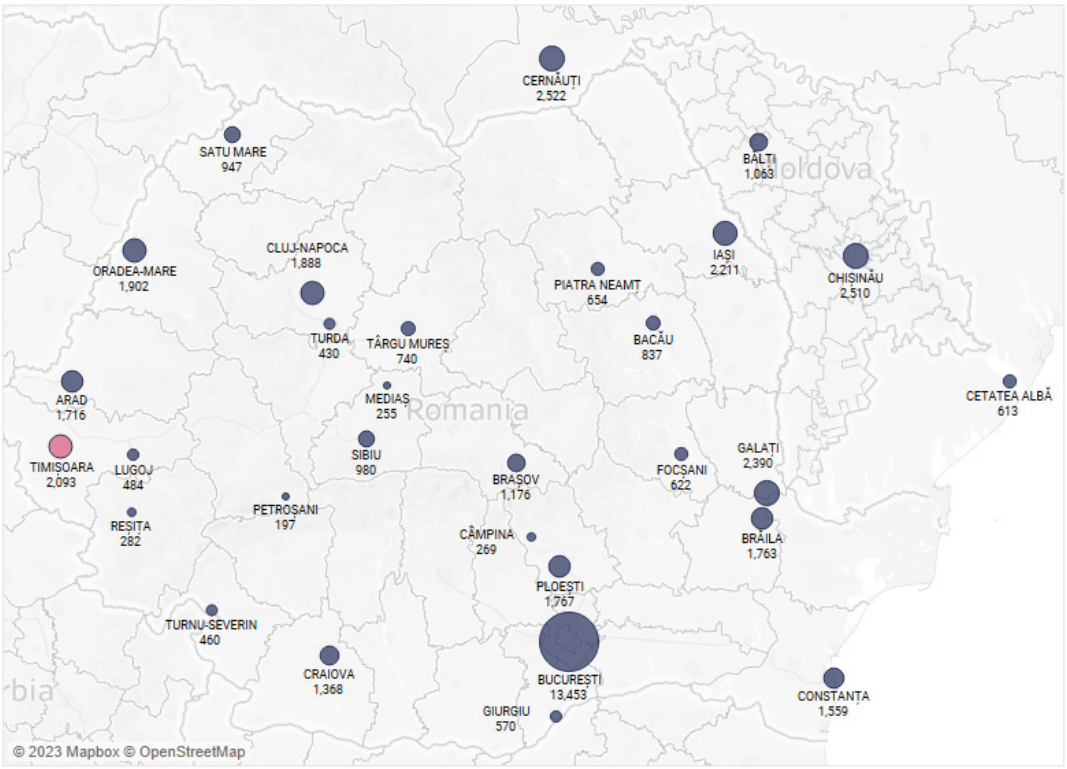
Thus, the wood, clothing, and food industries exhibit comparable expansion, reflecting the number of economic entities existing before the war. Notably, the chemical industry experienced significant growth during the 1919-1930 period, with the emergence of 24 new enterprises compared to the previous five. The only sub-sector not witnessing an increase in the number of enterprises is that of electricity, gas, and water production plants, the majority of which were established before 1914. These entities are under public ownership, belonging to the Timișoara town hall, and the interwar period represents a phase of expansion for each, as confirmed by contemporary monographs.

The national-level situation serves as a partial indicator of the dynamics within the economic sector of Timișoara during the represented time intervals. Regarding entities established before 1914, Timișoara ranks fifth with a total of

733 enterprises, following the towns of Bucharest, Chișinău, Iași, and Cernăuți. In the period of 1919-1930, Timișoara dropped one place, being surpassed by Galați, while witnessing the establishment of 2,093 new enterprises. However, the specific scenario varies depending on the chosen economic branch. In terms of industrial enterprises, Timișoara boasts the highest number registered during the respective period (1,088), with Bucharest holding the first position as the capital of the country.

Fig. 1
Companies established between 1919-1930, by city.

Data source: Census, 1930.



Tab. 1
Companies established, by period and city.

Data source: Census, 1930.

Cities	<1914	1914-1918	1919-1930		Total
București	16.5%	5.4%	78.1%	100%	(17,229)
Ploiești	18.3%	6.2%	75.5%	100%	(2,342)
Cluj-Napoca	24.1%	5.3%	70.7%	100%	(2,672)
Timișoara	24.7%	4.9%	70.5%	100%	(2,970)
Arad	24.7%	5.6%	69.7%	100%	(2,462)
Other	25.1%	6.2%	68.7%	100%	(1,482)
Iași	26.1%	6.4%	67.5%	100%	(3,275)
Brașov	32.3%	5.5%	62.2%	100%	(1,891)
Total	22.8%	5.9%	71.3%	100%	(66,933)

Legal structure

The legal structure of enterprises provides a more accurate reflection of the economic context at the locality level and enables the establishment of hierarchies and relationships among different territorial units. The age of enterprises alone does not provide sufficient grounds for discussing the scale of the economy at the local level, as it encompasses all existing economic entities without further categorization based on the number of employees or technological aspects.

Compared to the 3,184 from Timișoara, the case of Chișinău exemplifies this, with a total of 4,111 enterprises. However, the former comprises only half the number of employees compared to the companies in Timișoara. Thus, the legal structure of enterprises is classified into the following categories: sole proprietorships (with only one employee), joint-stock companies, cooperatives, public ownership, and a category encompassing other forms as well as entities with unspecified forms. While personnel details are presented in a separate section, the legal structure of a firm allows for assumptions regarding the situation within a particular sector.

At the level of Timișoara city, out of 3184 enterprises, 2817 are represented by individual enterprises. This fact is common across all urban localities in Romania, where individual enterprises constitute most economic entities. Therefore, to capture the specificity of the local economy, the remaining 367 entities need to be analysed.

A noteworthy observation is that, after the capital city, Timișoara has the highest number of enterprises when excluding individual ones. Out of this total, approximately 60% (222) are represented by joint-stock companies, approximately 24% (87) are partnerships, and 8% (30) are publicly owned enterprises (owned by the state, county, or municipality). The economic specificity of the locality and the scale of economic activities are demonstrated by the dominance of joint-stock companies and their number compared to other urban settlements.

Considering that joint-stock companies required larger initial capital and were tied to specific business objectives, they often corresponded to medium and large-sized firms. Although there are cities with a higher proportion of joint-stock companies, this is influenced by factors that are more related to the specific nature of local economic sectors (as is the case with Petroșani, where the proportion is determined by the presence of a strong extractive sector that requires significant available capital and investments that may not be accessible at an individual level).

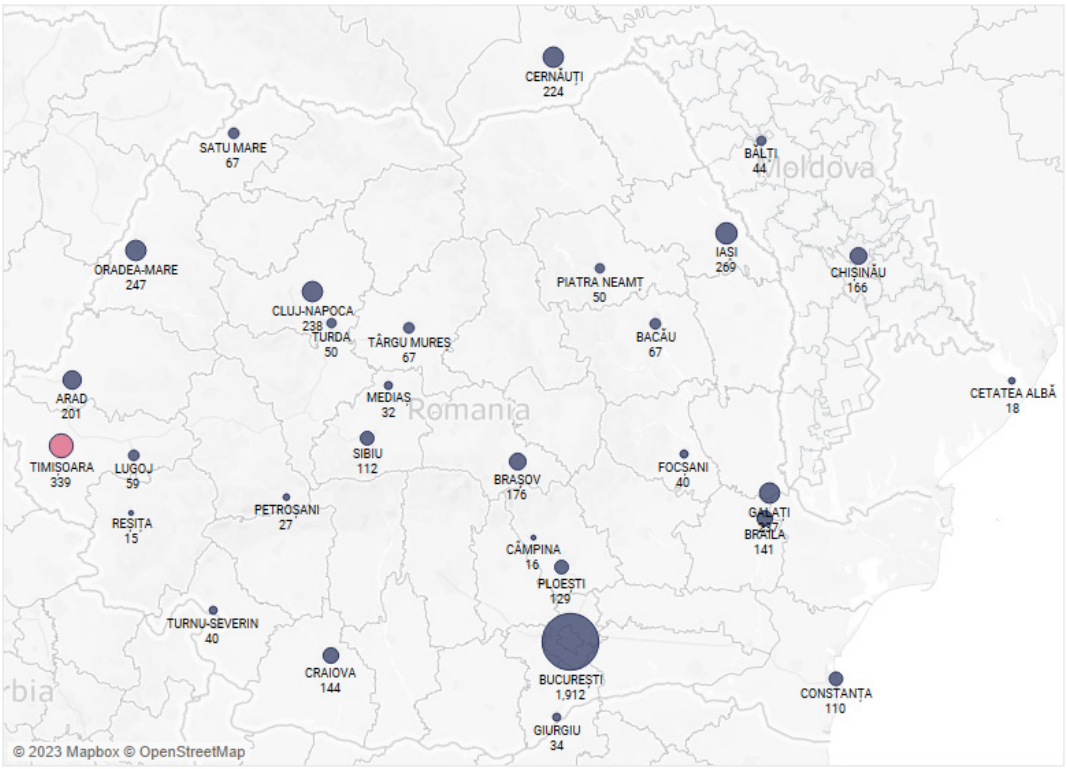
However, in terms of absolute value, Timișoara ranks second after Bucharest in terms of the number of joint-stock companies, followed by Cluj-Napoca (150), Oradea-Mare (136), Brașov (108), and Arad (101). In terms of sector distribution, approximately 42% (93) of these companies are classified under the industrial sector, with dominant sub-sectors being manufacturing and clothing industry

(22), food industry (17), textile industry (14), metallurgical industry (12), and chemical industry (12).

Another distinctive aspect is reflected in the high number of publicly owned economic units (30), which is the highest at the national level. Out of this total, 20 are industrial enterprises, with notable presence in the food industry (6), chemical industry (4), and local factories (4). In the case of factories, the status of the electric factory is exemplary, as it was initially established by private agents and later municipalized in the late 19th century.

Fig. 2
Public, joint-stock and in partnership companies by city in 1930

Data source: Census, 1930.



Tab. 2
Companies established, by period and city.

Data source: Census, 1930.

Cities	Joint-Stock	In partnership	Public	Individual	Coop	Other	Total	
Timișoara	7.0%	2.7%	0.9%	88.5%	0.3%	0.6%	100%	(3,184)
Brașov	5.2%	2.9%	0.4%	89.9%	0.2%	1.4%	100%	(2,061)
Cluj-Napoca	5.1%	2.7%	0.3%	88.6%	0.3%	3.0%	100%	(2,924)
București	4.0%	6.2%	0.2%	86.7%	0.3%	2.7%	100%	(18,473)
Arad	3.9%	3.2%	0.7%	90.3%	0.4%	1.5%	100%	(2,565)
Ploești	3.0%	2.0%	0.2%	92.0%	0.2%	2.7%	100%	(2,514)
Iași	2.6%	4.8%	0.3%	90.8%	0.2%	1.4%	100%	(3,533)
Other cities	2.5%	2.8%	0.2%	91.8%	0.3%	2.4%	100%	(1,579)
All cities	3.4%	3.8%	0.2%	90.1%	0.3%	2.3%	100%	(71,573)

Technological level

One of the indicators found in the 1930 industrial census enables us to comparatively examine the level of economic development, particularly the technological advancements of enterprises within a specific city. This indicator pertains to the motive power generated by the available engines across all economic units.

The measurement of motive power is in horsepower, and the census document records the number of enterprises possessing such means of production (categorised according to their horsepower capacity) and the energy source on which these means rely.

Thus, the distribution of the generated horsepower is recorded for various types of machinery, including steam engines, combustion and internal combustion engines, hydraulic engines, electric engines, and a section for other types or instances where data is insufficient.

The presented data primarily focuses on industrial enterprises, which are the main producers and consumers of motive power. The census distinguishes between industrial enterprises and other types, such as commercial or financial units, which are grouped into a separate category. The position of Timișoara within this context varies depending on the variable used to establish the hierarchy of cities, but it exhibits distinct differences compared to other localities.

In terms of the number of enterprises possessing motive power, Timișoara ranks second nationally, following the capital city of Bucharest. Given its status as the capital, Bucharest warrants separate analysis due to its significant disparities from other localities.

Timișoara houses 373 industrial units, followed by Cluj-Napoca (212), Arad (193), Sibiu (181), and Brașov (178). Concerning their distribution based on horsepower capacity, the locality comprises 190 industrial enterprises with a driving force ranging between 1 and 5 horsepower, 147 enterprises with a driving force between 6 and 50 horsepower, and 36 enterprises exceeding 50 horsepower. The sectors with the highest concentration of such means of production include metallurgical industry (93 units), wood industry (63 units), food industry (58 units), manufacturing and clothing industry (56 units), and textile industry (53 units).

The distribution may vary depending on the capacity potential of units within each category. Consequently, the hierarchy among units possessing machines with a potential of over 50 horsepower is primarily dominated by the food sector (11 units), followed by the textile sector (8 units) and the chemical sector (5 units).

Another distribution is based on the overall capacity potential of machines within a locality, regardless of the energy source employed, and is measured in horsepower.

Timișoara occupies the fourth position nationwide, trailing behind Bucharest, Câmpina, and Reșita. While Bucharest's leadership position is expected as the capital, the higher capacities of the latter two localities are closely tied to their specific industries. Both cities host pivotal industrial units on a national scale. Reșița, for instance, boasts the Reșița Factories and Domains, with most of the city's motor capacity stemming from the metallurgical sector. Similarly, Câmpina played a significant role in the burgeoning national oil industry.

The industrial sector in Timișoara possesses a driving capacity of 28,149 horsepower, of which 59% is produced by the city's own plants, such as electric or gas-powered facilities. This fact is noteworthy since the productive consumption of engines within the factories generates energy that subsequently benefits other sectors. Other notable sectors include the food industry (13%), textile industry (10%), and metallurgical industry (5%).

Regarding the distribution of the driving capacity, it is structured based on the operational types of engines, as previously mentioned. In the case of Timișoara, the motive force predominantly originates from two types of engines: steam engines (approximately 61%) and electric engines (approximately 38%). Steam engines are employed within local factories, while electric engines are primarily utilised across the manufacturing sectors.

Nationally, Timișoara holds the third position in the hierarchy of cities concerning the motive force generated by steam engines (following Câmpina and Bucharest), whereas it ranks fourth for electric engines (trailing Bucharest, Reșita, and Brașov).

This distribution holds significance as it reveals essential aspects regarding the scale of the economy and contributes to our comprehension of the technological level prevailing at the local level. Despite initial developments, electric motors gained widespread usage in industry only toward the end of the 19th century. Therefore, their presence, particularly within the context of interwar Romania, signifies a competitive advantage possessed by industrial enterprises.

Tab. 3
Motive power installed in factories, by engine technological type, by city, 1930

Data source: Census, 1930.

City	Steam	Electric	Internal combustion	Hydraulic	Others	Total Motive Power	
Arad	67%	7%	11%	0%	16%	100%	(22,921
Timișoara	61%	38%	1%	0%	0%	100%	(28,149
Other	36%	31%	24%	9%	1%	100%	(9,044)
Ploiești	23%	8%	66%	0%	3%	100%	(9,851)
Brașov	20%	67%	12%	1%	0%	100%	(22,374)
Cluj-Napoca	20%	35%	39%	3%	3%	100%	(10,283)
Iași	14%	13%	72%	0%	1%	100%	(9,275)
București	11%	54%	32%	2%	1%	100%	(155,341)
All cities	**29%**	**39%**	**26%**	**4%**	**2%**	**100%**	**(457,166)**

Personnel

Another important indicator used in the census and related to enterprise size is the number of employed personnel. Specifically, employee data is categorised based on company size or the positions individuals hold within an enterprise. The first categorization is made according to the following ranges: 1 person, 2-5 persons, 6-20 persons, 21-50 persons, 51-100 persons, 101-200 persons, 201-500 persons, and over 500 persons. For each category, the number of employees is provided alongside the number of enterprises falling into that range. The second distribution pertains to the positions held by workers and includes classifications such as managers, office or sales clerks, skilled workers, apprentices, and unskilled workers. Moreover, data for each category is recorded based on the employees' gender and nationality.

At the national level, Timișoara ranks second in the hierarchy of total employed personnel, following Bucharest, with a total of 23,178 individuals engaged in local businesses. Other urban localities with significant employment figures include Arad (21,139), Cluj (19,625), Ploiești (18,559), and Brașov (17,517). In the case of Timișoara, approximately 73% of the workforce is employed in the industrial sector, while 19% is involved in commercial activities. The industrial branches with the highest number of employees include textile (3590), clothing (3448), metallurgy (3046), and food (2992). The dominance of these branches, as observed in previous examples, can be attributed to several factors. The concurrent development of the textile and clothing industries, for instance, is a consequence of their complementary nature, wherein the former produces raw materials for the latter. Furthermore, the growth of the food industry in Timișoara is influenced by the city's geographical location in a fertile plain, surrounded by predominantly rural communities.

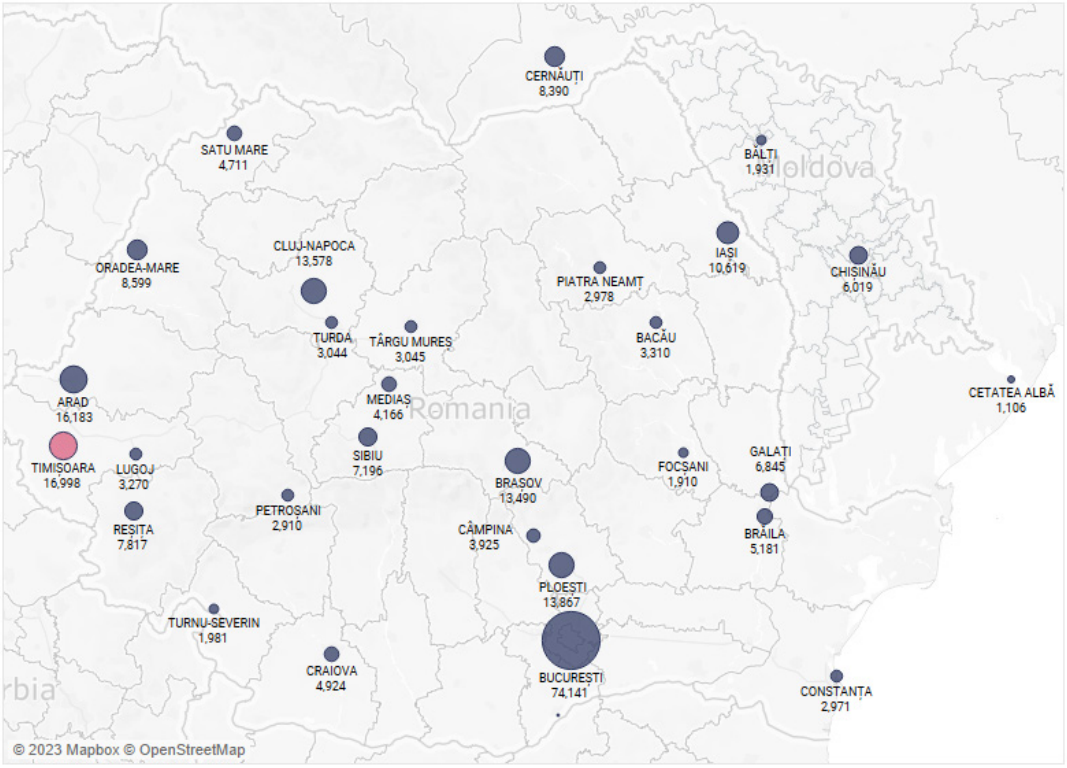
In terms of the number of enterprises based on the number of employees, when considering economic entities with a minimum of six employees, Timișoara ranks second after Bucharest. This approach becomes necessary due to the prevalence of sole proprietorships, which employ only one person, thereby leading to inconsistent hierarchies that fail to accurately reflect the local economic situation and the size of local firms. Notably, Timișoara distinguishes itself on a national level by the significant presence of businesses with employee counts ranging between 51 and 100, as well as between 101 and 200, which together employ approximately 4,600 individuals. This trend aligns with observations in other urban areas where companies with a substantial workforce tend to be concentrated in the industrial sector. Within Timișoara, the three companies with the highest number of employees are evenly distributed among the textile, food, and wood processing sectors.

Examining the distribution of personnel by category and gender reveals noteworthy elements. Except for the category encompassing unskilled workers, the other categories are predominantly male dominated. In contrast, unskilled workers are predominantly women, with 5,109 women compared to 3,995 men, primarily employed in the textile and food sectors. However, the

percentage difference varies depending on the job position. Women are found in higher proportions in office or commercial roles, while a significant discrepancy exists in the case of skilled personnel, with 4,642 men compared to 529 women.

Fig. 3
Employees in industry, by city, 1930

Data source: Census, 1930.



Tab. 4
Employees in industry, by size of the company in employees, by city, 1930

Number of employees	1	2-5	6-20	21-50	51-100	101-200	201-500	>500		Total
Timișoara	3%	16%	19%	11%	11%	15%	12%	12%	100%	(16,998)
Brașov	3%	14%	16%	8%	9%	11%	18%	21%	100%	(13,490)
București	2%	18%	17%	10%	8%	7%	15%	23%	100%	(74,141)
Other	6%	30%	23%	10%	7%	7%	10%	6%	100%	(4,374)
Ploești	2%	12%	11%	6%	7%	7%	22%	33%	100%	(13,867)
Iași	6%	20%	17%	6%	7%	7%	11%	27%	100%	(10,619)
Cluj-Napoca	4%	20%	22%	14%	8%	7%	10%	16%	100%	(13,578)
Arad	3%	12%	11%	6%	6%	2%	4%	56%	100%	(16,183)
All cities	4%	22%	19%	10%	8%	8%	12%	18%	100%	(254,939)

The Socialist Economy of Timișoara, 1950-1989

Investment Patterns and Labor Structure within the National Economic Geography

This chapter examines the socialist economy of Timișoara, Romania, from 1950 to 1989, focusing on investment patterns and labour structure. The study employs specially devised indices to assess the impact of socialist investments, highlighting the relationship between industrial investments and employment rates. The formation of communes and urban zones shaped investments, leading to changes in the social structure. Agriculture relied on unpaid peasant labour organised in cooperatives, while urban workers had employee status. The monetization of rural areas and agricultural products transformed peasants into producers and traders. Timișoara, a significant industrial hub, received investments in various branches, particularly machinery and textiles. The region experienced rural-urban migration, influenced by demographic shifts and industrial expansion. The analysis reveals the interplay between investment strategies, labour structure, and migration dynamics, contributing to a deeper understanding of the socialist economy in Timișoara.

Socialism was never municipal but universal, as Pobłocki (2018:328) aptly phrased it, that is socialist infrastructure aimed to provide collective consumption in areas such as housing, education, health, culture, and commerce. This collective consumption reorganised collective identities and alliances, and socialist infrastructure, including housing, schooling, and medical dispensaries, likely leaving a spatial trace in the community in terms of existing patrimony. This argument is at odds with the thesis of death of consumer goods in socialism (Verdery, 1996) and highlights the importance of collective consumption in socialist societies. However, most of these investments were conditional on industrial investments. To rephrase Pobłocki (2018:328), socialist universality was a conditional municipal, that provided the investment in industrial modernity.

Petrovici's indices (2013; 2018) were employed to assess the impact of socialist investments, which encompassed a four-decade period in Romania. These indices provide a classification of regions (NUTS-3) and economic activities based on investment patterns. Regions that experienced greater industrial investments tend to exhibit higher numbers of employees. On the other hand, regions with a focus on agricultural investments may have higher rates of in-work poverty. Geographical factors also play a role in shaping investment patterns. Plain regions, for instance, tend to receive more investments in agriculture due to their favourable conditions for farming. In the case of Timiș, it received a larger share of agricultural investments throughout the socialist era. Additionally, while it received investments across various branches of manufacturing, these investments were somewhat concentrated compared to Bucharest, but still above the national median.

Two key policy concepts shaped investments in Romania and influenced persistently the spatial development of labour pools: commune formation and urban zone formation.

In 1950, at the beginning of the communist era, over 70 percent of the Romanian population lived in rural areas, scattered across more than 20,200 villages, which were organised into 4,052 communes. By 1990, the number of villages decreased to around 13,000, forming 2,600 communes. The aim was to cluster the villages into more compact communities to make investments in amenities and social services more cost-effective. Moreover, this transformation aimed to turn the dispersed, self-sufficient villages into consolidated localities that could supply labour to urban factories and rural farms. The concept of a communal centre revolved around the clustering of social services provided by the state and the provision of amenities such as pipelines, sewage systems, and electricity. The goal was to incentivize villagers to regroup spatially around these centres. This concept gained significant prominence during the communist era when members of the Gusti School, including Henri H. Stahl and Miron Constantinescu, assumed responsibility for the planning process within the post-1948 Communist government.

The concept of an urban zone referred to the hinterland of an urban centre that utilised rural areas as supply zones for raw materials and labour. Investments were driven by local natural resources and previous pre-socialist investments, with the goal of creating value chains based on input-output networks connecting urban industries with rural mining, forestry, and agriculture. Thus, between 1950 and 1990, counties specialised in different sectors based on their local resources. Some counties specialised in industries, particularly in Transylvania, Banat, and the Ploiești-Argeș-Bucharest cluster. Others focused on agricultural production, primarily located in the southern part of Romania. A small portion of counties specialised in services, acting as export hubs abroad, such as Brăila-Galați, Constanța, and Bihor.

Fig. 4
The index of investment in socialism across five-year plans, 1950-1985.
Agricultural dominated –100 with red, services dominated 0 with grey, industrial dominated 100 with blue.

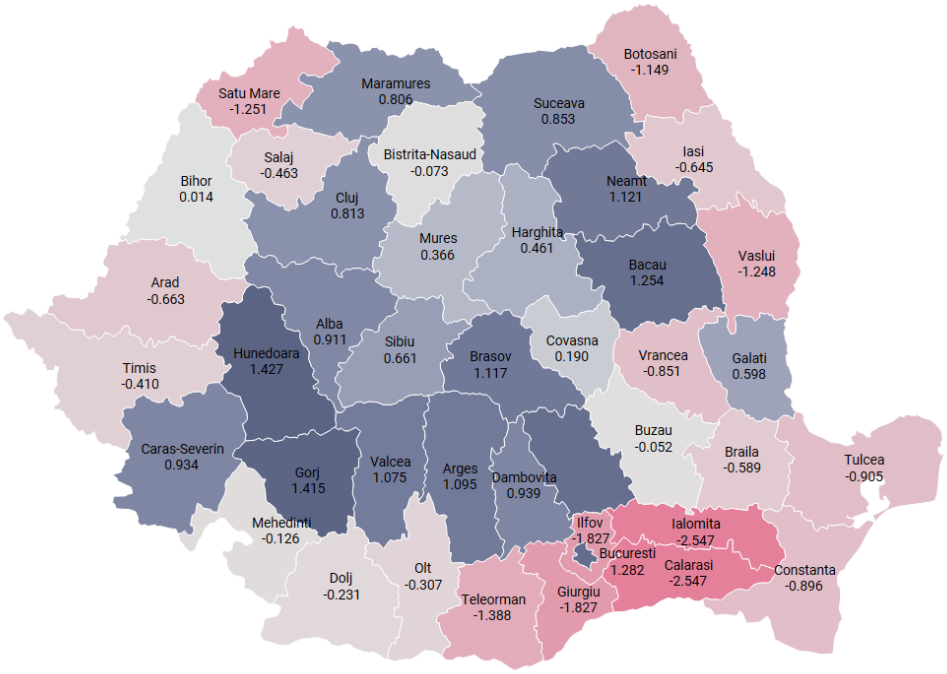
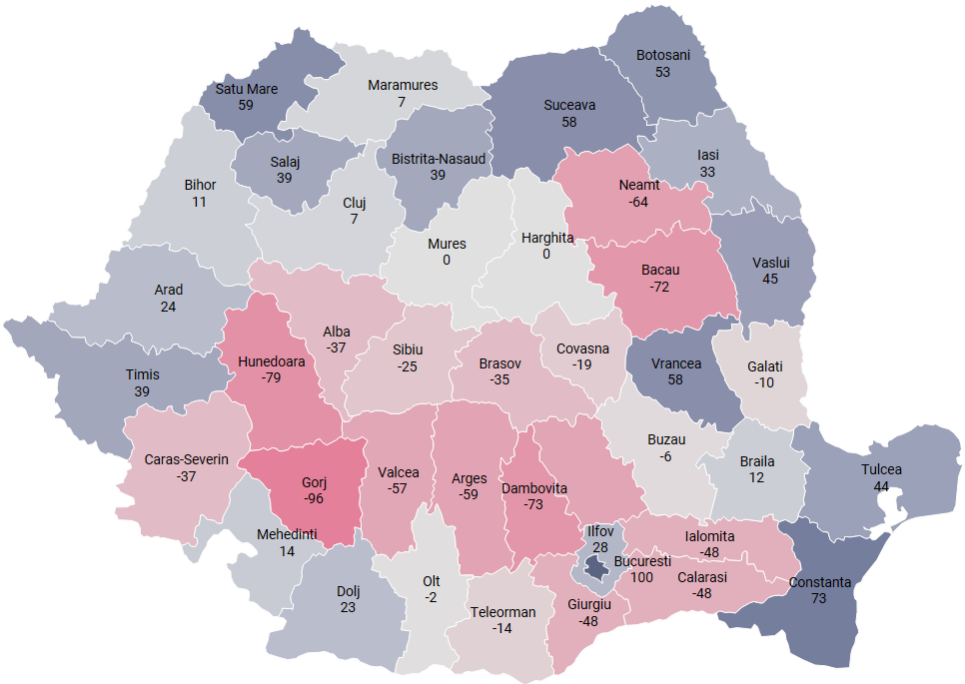


Fig. 5
The index of investment diversity across manufacturing branches in 1985.
Concentrate in one branch is –100 with red, equally distributed 0 with grey, dispersed across branches is 100 with blue.



Social structure in socialism in Timiș

Social structure. A major distinction to be made about the social structure during socialism was between waged and unwaged workers, on the one hand, and blue and white collars on the other hand.

During the socialist era, agriculture in Romania relied on unpaid peasant labour organised in cooperatives where they were compensated with dividends in kind at the end of the year. Rural workers received a portion of the agricultural production for each day worked, rather than cash. These products were mainly used for personal consumption or sold at various markets. Any excess products were added to a consumer goods fund used to feed the urban population or for export. Peasants were not considered employees, unlike urban workers who had employee status in industry, construction, or services.

The monetization of rural areas and agricultural products involved transforming peasants into producers and traders and was driven by the interdependence between urban and rural markets. Agricultural products were intended for urban or external markets, allowing rural populations to purchase industrial goods. However, the monetary flow was vulnerable due to asymmetrical relationships and price ratios that favoured urban populations. The ratio of agricultural workers to urban employees was crucial for the consumer goods state fund.

Investments made in both industry and agriculture led to a significant negative correlation between the percentage of unpaid farmers and blue-collar workers in Romania and Timiș. The formation of cooperatives, which involved mechanisation and modernization of production methods, led to increased productivity and freed rural farmers from labour-intensive work. At the same time, industrialization attracted people to urban areas.

State Agricultural Enterprises (SAE) were formed after 1968, with a structure like factories. People working in cooperatives and SAE were given wages, and there were experiments with cooperative and SAE unions to have planned access to mechanised tools. This led to a significant increase in the number of employees in the primary sector countrywide. Timiș had the highest number of people employed in agriculture compared to other regions in Romania during the socialist era.

Unwaged farmers. Among farmers, the percentage of unwaged farmers in Timiș County decreased from 66% in 1950 to 6% in 1990, while the percentage of unwaged farmers in Romania decreased from 74% in 1950 to 22% in 1990.

Waged personnel. The total number of employees in Timiș County increased over the years, with 215.4 thousand employees in 1970 and 282.2 thousand employees in 1985. Between 1950 and 1990, Timiș County and Romania both underwent significant social changes. One of the most notable changes was the increase in the proportion of blue-collar workers and the decrease in the proportion of unwaged farmers in both regions. However, Timiș County had a

higher percentage of white-collar workers than Romania throughout the period, with a difference ranging from 2% to 5%.

Tab. 5
Comparative Social Structure in Timiș County and Romania 1950-1990.

Year	Waged White Collar	Waged Blue Collar	Unwaged farmers	Working
Timiș				
1950	13%	21%	66%	100% (311,661)
1955	14%	28%	58%	100% (305,075)
1960	13%	35%	52%	100% (315,512)
1965	15%	41%	44%	100% (325,291)
1970	15%	48%	38%	100% (326,457)
1975	15%	61%	25%	100% (330,875)
1980	17%	69%	14%	100% (330,982)
1985	17%	68%	15%	100% (330,406)
1990	21%	73%	6%	100% (299,964)
Romania				
1950	10%	15%	74%	100% (8,399,700)
1955	10%	21%	69%	100% (9,379,100)
1960	9%	25%	65%	100% (9,552,600)
1965	12%	32%	56%	100% (9,706,400)
1970	13%	39%	49%	100% (9,902,700)
1975	13%	49%	38%	100% (10,182,500)
1980	14%	57%	29%	100% (10,375,400)
1985	14%	57%	29%	100% (10,534,600)
1990	16%	61%	22%	100% (10,477,150)
1950	2%	7%	-8%	
1955	4%	8%	-12%	
1960	3%	11%	-13%	
1965	3%	9%	-12%	
1970	2%	9%	-11%	
1975	2%	12%	-13%	
1980	3%	12%	-15%	
1985	3%	11%	-14%	
1990	5%	12%	-16%	

Fig. 6
Distribution of population and various categories of employees in Timiș County, 1950-2022.

Data source: National Yearbooks 1979-2022

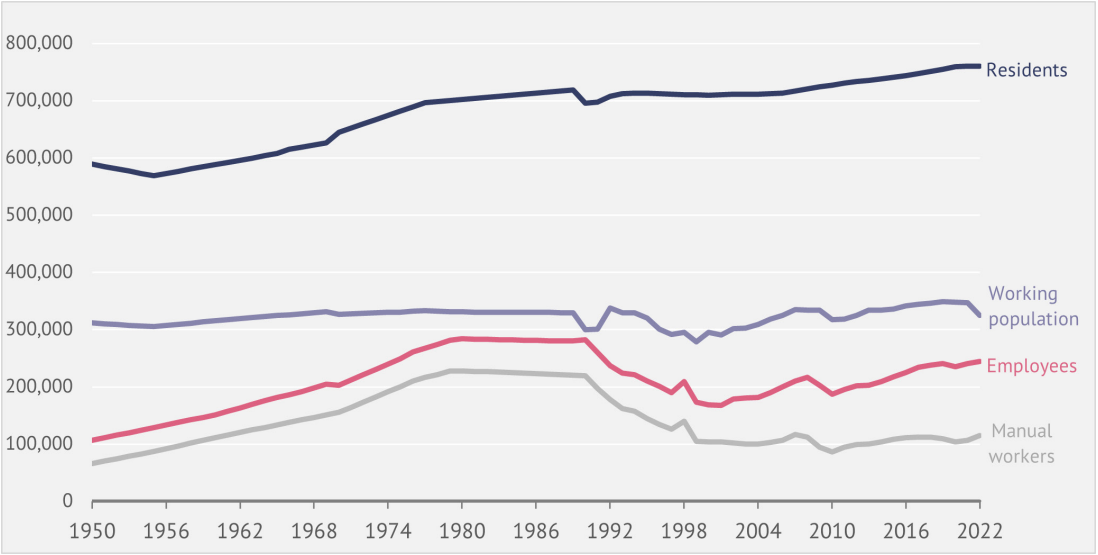
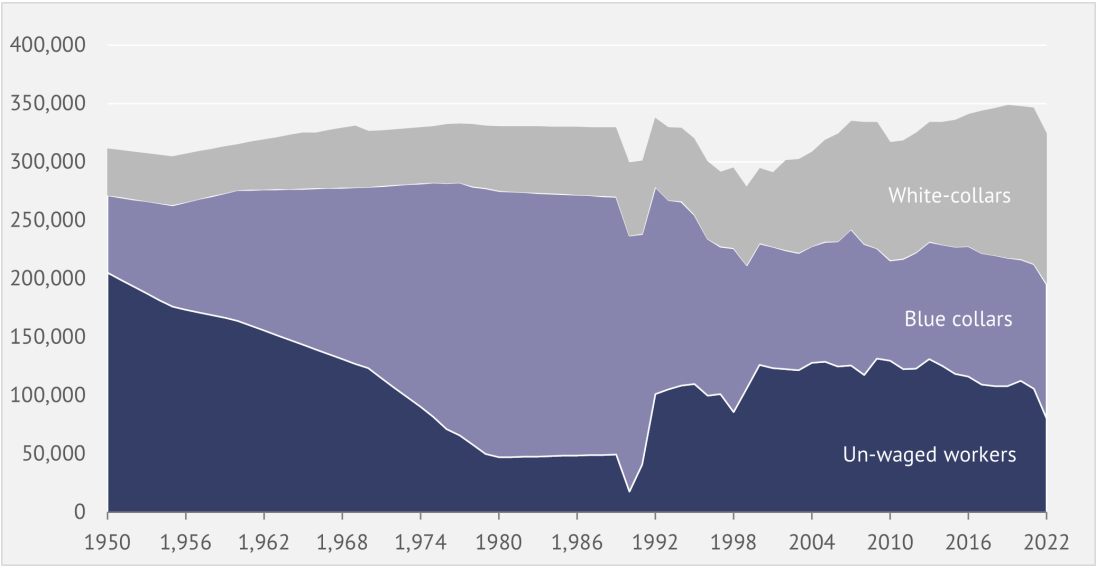


Fig. 7
Distribution of population and various categories of employees in Timiș County, 1950-2022.

Data source: National Yearbooks 1979-2022



Employees by sector

The proportion of white-collar workers in Timiș County ranged from 13% in 1950 to 21% in 1990, while the proportion of white-collar workers in Romania increased from 10% in 1950 to 16% in 1990. Similarly, the percentage of blue-collar workers in Timiș County increased from 21% in 1950 to 73% in 1990, while the percentage of blue-collar workers in Romania increased from 15% in 1950 to 61% in 1990.

One of the factors contributing to Timiș County's above-average number of employees in the agricultural sector was the presence of State Agricultural Enterprises, which had a high number of tractors and agricultural combines compared to other counties. The county also had the largest number of animals, making it a leader in the agricultural industry. Consequently, Timiș County had the most advanced technical agricultural sector in the country, with the highest productivity and largest workforce.

The proportion of employees in the circulation of goods, education, culture & art, and health & social assistance sectors were similar in Timiș County and Romania, averaging at 9.3%, 7.6%, and 4.6%, respectively. However, the science branch had an increasing proportion of employees over the years, with an average of 1.5% across the years. Meanwhile, the administration branch had a stable proportion of employees, averaging around 0.7%

The industry sector saw an increasing proportion of employees over the years, rising from 43% in 1970 to 60% in 1985, with an average of 55% across the years. Construction and transport also had notable proportions of employees, averaging at 10% and 7.5%, respectively, throughout the years.

Timiș County had a significant proportion of employees in the machinery and textiles sectors and a lower proportion in the energy, fuel, ferrous metallurgy, non-ferrous metallurgy, timber & furniture, garment, and printing sectors. The food, leather, chemicals, and construction sectors had varying proportions of employees in Timiș County compared to national values.

Timiș County had an above-average proportion of employees in the machinery sector, with an average of 31.9% across the years, which was the largest number of employees in the county. Similarly, the textiles sector had an above-average proportion of employees in Timiș County, with an average of 22.2%. The energy, fuel, ferrous metallurgy, non-ferrous metallurgy, timber & furniture, garment, and printing sectors had below-average differences in Timiș County compared to national values, with adjusted standardised residuals ranging from $p < 0.001$ to 1.7%.

The food and leather sectors had above-average differences in some years but below-average differences in others, resulting in an average of 7.6% across the years. The chemicals and construction sectors had above-average differences in Timiș County, with an average of 8.3% and 5.4%, respectively. However, the construction sector had a below-average difference in the 1980s.

Tab. 6
Proportions of Employees in Timiș County by Five Successive Years and Economic Branches. Statistically Significant Differences Compared to National Values

Above-Average Differences:
●p < 0.050.

Below-Average Differences:
●p < 0.050

	1970	1975	1980	1985
Industry	43%	55%	61%	60%
Construction	9%	9%	11%	9%
Agriculture	13%	13%	15%	16%
Forestry	0.3%	0.4%	0.4%	0.5%
Transport	6%	7%	7%	10%
Telecom	1.1%	1.2%	1.4%	1.4%
Circulation of goods	8%	9%	10%	10%
Communal household	5%	6%	7%	7%
Education, Culture & art	7%	8%	8%	8%
Science	1.0%	1.2%	1.7%	2.1%
Health & social assistance	3.8%	4.6%	5.1%	5.0%
Administration	0.7%	0.7%	0.6%	0.6%
Other branches	1.4%	1.5%	1.8%	2.1%
Total	100%	100%	100%	100%

Tab. 7
Proportions of Employees in Timiș County by Five Successive Years and Manufacturing Branches. Statistically Significant Differences Compared to National Values

Above-Average Differences:
●p < 0.001

Below-Average Differences:
●p < 0.001

Manufacturing branch	1960	1965	1970	1975	1980	1985
Energy	1.4%	0.5%	0.5%	0.4%	0.4%	0.3%
Fuel	0.9%	0.3%	0.4%	0.5%	0.6%	1.2%
Ferrous Metallurgy	3.7%	2.3%	2.1%	1.6%	1.5%	2.4%
Non-ferrous Metallurgy	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Machinery	19.6%	22.4%	25.2%	30.8%	34.8%	58.4%
Chemicals	3.8%	5.5%	7.9%	9.0%	9.0%	14.3%
Construction	9.6%	6.8%	6.4%	4.7%	4.2%	1.0%
Timber & Furniture	10.5%	9.7%	9.0%	7.7%	7.4%	2.0%
Textiles	30.1%	24.8%	23.3%	22.8%	22.2%	10.2%
Garment	4.8%	4.2%	4.8%	4.7%	3.6%	2.0%
Leather	13.9%	11.9%	9.9%	8.6%	8.3%	0.7%
Food	1.3%	10.6%	9.8%	8.7%	7.7%	7.6%
Printing	1.7%	1.5%	1.3%	1.0%	0.8%	0.1%
Total	100%	100%	100%	100%	100%	100%

Investments by sector

According to the Statistical Yearbook, the investment strategies in Timiș County changed over time, with a shift towards industry and agriculture investment in later years. The highest total amount of investments in Timiș was during the seventh five-year plan (1981-85) with a total of 6,405 million USD. The lowest amount was during the first five-year plan (1951-55) with a total of 356 million USD. For the 1985-1990 period, there is no data on investments.

In terms of agriculture, the proportion of investment was significantly below average during the first five-year plan (1951-55) but was above the national average from 1956 onward. Timiș was a powerhouse in terms of agri-production.

The services received one third of investments across the five-year plans, with most of the investments being in communal households, that is collective housing. Since 1971, the investments were above the national average, which was the year when the new districts received significant resources to house the incoming cohorts of workers.

The proportion of investment in education, culture & art was below the national average from 1961 until 1985. The proportion of investment in health & social assistance was below average during most of the five-year plans, except for the 1981-85 plan when much of the investments in services were driven by Timișoara. Also science received above average investment between 1976-1980 mostly due to the new buildings of the Polytechnic University and the push for science departments in the West University.

The data shows that the proportion of investment in industry was above average during the first five-year plan (1951-55) and significantly below the national average in subsequent five-year plans (1961-65 and 1966-70). However, during the fifth five-year plan (1971-75), the proportion increased significantly above the average and remained above average in the following two five-year plans (1976-80 and 1981-85).

In the 1950s, factories were retrofitted and extended, and Timișoara had a complex pre-socialist industry, which explains the above national average investments in installation and construction work in the first half of the decade.

The first wave had taken place under the Habsburgs (1716-1867) with the Beer Factory (1718) and Cigarette Factory (1846) as best known factories at that time; the second wave had come under the Austro-Hungarian administration (1867-1918) with the development of the Alcohol Factory and Refinery (1869), Kandia sweets factory (1890), Turul shoe factory (1902), ILSA wool factory (1903), Fructus canned foods factory (1903) – by the 1910 census Timişoara had 62 industrial plants with 7155 employees; the third wave had come in the interbellum (1918-1944): it represents a stage characterised by political

changes and the development of the city industry, with new factories being established: Dura battery factory (1921), Lumina chandelier factory (1925), Dermatina leather factory (1934) – by the 1930 census Timișoara had 1849 factories with a personnel of 16,998 second after Bucharest.

This pre-existing manufacturing industry explains the significant amount of investment being directed towards refurbishing the factories, resulting in above-average investments in installation and construction work in the first half of the 1950s – most being machinery.

Tab. 8
Proportions of Investments in Timiș County by Five-Year Plans and Economic Branches. Statistically Significant Differences Compared to National Values

Above-Average Differences:
p < 0.001
p < 0.050

Below-Average Differences:
p < 0.001
p < 0.050

	1951-55	1956-60	1961-65	1966-70	1971-75	1976-80	1981-85
Industry	64%	46%	24%	39%	41%	44%	36%
Construction	4%	1%	3%	5%	5%	3%	3%
Agriculture	7%	27%	43%	33%	24%	24%	36%
Forestry	1%	2%	0%	0%	0%	0%	0%
Transport	9%	11%	7%	6%	8%	6%	4%
Telecom	1%	0%	1%	1%	1%	1%	1%
Circulation of goods	2%	2%	5%	4%	4%	4%	2%
Communal household	6%	6%	10%	8%	9%	11%	14%
Education, Culture & Art	2.8%	1.9%	4.4%	2.9%	3.9%	4.4%	0.9%
Science	1.1%	0.3%	0.5%	0.3%	0.3%	0.9%	0.3%
Health & social assistance	2.8%	1.0%	1.4%	0.9%	1.3%	0.6%	0.7%
Administration	0.3%	0.4%	0.4%	0.4%	0.1%	0.2%	0.2%
Other branches	0.8%	0.4%	0.5%	0.5%	0.3%	0.0%	0.2%
Installation & construction work	59%	44%	42%	43%	40%	40%	41%
Total	100%	100%	100%	100%	100%	100%	100%

Investments by manufacturing branch

The total amount of investments in Timiș County increased from USD 779,872 million in 1970 to USD 2,275,683 million in 1985. The manufacturing branches with the highest proportion of investments were machinery (23.9%), chemicals (15%), fuel (13.8%), and food (10.6%). Meanwhile, the manufacturing branches with the lowest proportion of investments were non-ferrous metallurgy (0.7%), clothing (0.5%), and printing (0.5%).

The proportions of investments in different manufacturing branches varied over the years. For instance, the proportion of investments in energy, fuel, machinery, chemicals, textiles, leather, and food were higher in 1985 compared to 1970, while the proportions of investments in ferrous metallurgy, non-ferrous metallurgy, and construction were lower in 1985 compared to 1970.

Moreover, there were significant differences between Timiș County and the national values in terms of the proportions of investments in manufacturing branches. For example, the proportions of investments in fuel, machinery, textiles, leather, food, and printing were above national values, while the proportions of investments in ferrous metallurgy, non-ferrous metallurgy, and construction were below national values.

This historical variation in investment and manufacturing branches exhibits strong links with the larger national socialist context. For Timișoara, socialist investment in manufacturing constituted the fourth wave of investments, divided into three distinct periods: 1948-1955, 1965-1980, and the 1980s.

During the **first period of 1948-1960**, much of the effort was dedicated to refurbishing and expanding the productive capacities of the post-war era. The currency obtained from the exports of raw materials exported by Romania in the 1950s, such as cement, crude oil, timber, iron, and steel plates and sheets, was largely used to purchase new industrial capital goods and technologies, which equipped existing factories with machinery and tools (Montias, 1963).

Timișoara's industry received a significant proportion of these investments. This was achieved by either providing new tools and equipment as factories were nationalised, such as the significant upgrade for leather goods and upholstery that Dematina received after nationalisation in 1954, or through consolidation and mergers after nationalisation, such as the merger in 1949 of the Tefag dyeworks with the Uranus dyeworks, the Sigmund textile factory, and the "Hamer and Nay" silk factory to form the Garofița Factory.

It was only after 1960 that large production units were built. Grama (2019) notes that the head of the Council of Ministers, Chivu Stoica, proudly declared to the Washington Post in 1959 that he could finally pay in dollars for Romania's imports. Mărginean (2015) enforces this observation by quoting a report by the US-funded Radio Free Europe, according to which party leaders were beginning to see the first "benefits of the ten-year austerity program". These "benefits" meant starting an independent industrialization program in

the early 1960s by building new factories. In the case of Timișoara, many factories were repurposed in the 1970s and greatly extended; nonetheless, new branches emerged.

Tab. 9
Proportions of Investments in Timiș County by Five Successive Years and Manufacturing Branches. Statistically Significant Differences Compared to National Values

Above-Average Differences:
●p < 0.001

Below-Average Differences:
●p < 0.001

Manufacturing branch	1970	1975	1980	1985
Energy	8%	8%	5%	20%
Fuel	18%	12%	10%	16%
Ferrous Metallurgy	1.1%	0.6%	1.1%	2.5%
Non-ferrous Metallurgy	1.0%	0.2%	0.0%	1.5%
Machinery	17%	27%	28%	24%
Chemicals	12%	10%	26%	12%
Construction	4%	9%	2.5%	2.0%
Timber & Furniture	6%	4%	2.8%	2.2%
Textiles	13%	16%	6%	3%
Garment	0.7%	0.7%	0.3%	0.3%
Leather	3.7%	2.1%	1.4%	0.6%
Food	10.6%	7.9%	11.3%	12.7%
Printing	1.2%	0.2%	0.2%	0.2%
Total	100%	100%	100%	100%

Second period, 1965-1980. Romania, after 1960, started to build large production units, and the independent industrialization program was started in the early 1960s by building new factories. In the case of Timișoara, many factories were repurposed in the 1970s and greatly extended. The existing industry received a significant upgrade of the timber & furniture, textiles, clothing, leather, food factories. These factories had strong connections with the local agricultural chain of production. For example ILSA Wool Industry Factory or the Banatul Shoe Factory were connected with animal farms in the region and, after the administrative reorganisation of 1968, with those in the county.

A key developmental policy tool during socialism was the creation of local production supply chains: raw materials and intermediate goods supply chains were interconnected around urban centres and their hinterlands, in parallel with policies of transforming the rural population into an urban population. Constantinescu (1974), the chairman between 1948 and 1957 of the *State Planning Committee*, named these policies of connecting the domestic production chains "urban areas" (Ro. "zone urbane"). The name captured the centrality of the socialist city to the accumulation strategy: the factories were interconnected in supply chains along the urban hierarchy to produce a built environment that contained the production facilities, housing, and social amenities. The urban environment contained the means of production and the labour force all while being a consumer of capital and intermediate goods produced elsewhere.

An illustration of the emergence of the *local supply chain* is the transformation of the old Habsburg tannery. The new factory required cowhide, which necessitated a comprehensive system of farms and specialised agriculture for animal feed production. The hides were primarily sourced from local farms in the Banat region. In the 1930s, Alfred Fränkel and the president of the "Turul" factory, Eduard Ritter Pest, were obliged to sell their shares to the leading competitor on the Romanian market. As a result, the largest shoe factory in former Austria-Hungary merged with "Fabrica de Pielărie Fraţii Renner & CO" from Cluj, and the hides were imported. However, throughout the 1950s, an increasing amount of investments generated a network of inland farms and tanneries after nationalisation. The resulting cow's milk from the farms was used in the Untim dairy factory, and a new supply chain emerged, consisting of a pig farming system that supplied the Comtim agricultural complex, Romania's largest industrial pork producer since 1967. This new supply chain provided a reliable source of raw materials to the new factory, which received a surge of investment in 1963 and became the colossal Banat Footwear Factory. In 1969, the factory merged with other factories and became Leather and Footwear Holding. Between 1971 and 1975, it received a new round of investments, making it one of the most significant shoe manufacturers in the country and a major exporter. In 1971, it formed a partnership with the German company Otter and received substantial investments in a semi-lohn system in the 1970s. Its daily production reached 11,800 pairs, with over half intended for export (mainly to West Germany, the USSR, the UK, and Libya). In 1975, the leather and footwear industry accounted for 10% of Romania's industrial production, with Timiș contributing 5.3% of the country's industrial production.

Furthermore, during the 1970s, production in Timișoara was repurposed and reused to *serve national production chains*. For instance, the ILSA Wool Industry Factory received an important technological upgrade between 1971 and 1975 and became a major supplier of fabrics and furniture upholstery to other companies within the country. Similarly, ELBA, which was in the interwar period a manufacturer of lighting fixtures, transitioned in 1952 to producing headlights and car lamps for tractors and trucks. Subsequently, ElectroBanat (ELBA) started developing the first headlights and lamps specifically designed for cars. With investments made in 1970, it became a critical supplier for Dacia cars. As a result, many factories in Timișoara became key suppliers of intermediate goods within larger national production chains and were opened to international markets through exports, from the socialist era onward.

Investments in machinery in Timiș amounted to a significant 25% of investments, on average, after the 1970s. This was particularly evident in major factories like ElectroBanat, Mechanical Enterprise, and Electric Motor Factory, which received investments above the national average from the 1970s onwards. These factories had a dual function: they supplied intermediate goods to other factories across Romania and emerged as major exporters of intermediate goods worldwide. For instance, ElectroBanat exported optical elements to Israel, Electric Motor Factory exported electrical motors to Malaysia, and Azur exported paints and thinners to Pakistan and Jordan (ACNSAS, 9741, ff 622-66).

During the third period, spanning from 1978 to 1986, Timișoara experienced a surge in investments in the chemical industry. This was due to Romania's planning committee identifying the chemical industry as a crucial driver of economic growth in the early 1970s (Ban, 2016). Consequently, there was a gradual shift in investments from heavy industry to industrial sectors powered by technological innovation (Ban, 2012; Petrovici, 2018). Timișoara benefited from this shift, not only because of the economic policy change but also because of the interrelatedness of its manufacturing branches.

For example, the Guban shoe factory, which was donated by its owner to the socialist state and became the "Bella Breiner" Factory in 1952, received investments in expanded artificial leather and plastics in 1964, becoming the Victoria Factory. In 1967, a new polyurethane foams section was added to ensure a steady supply chain, which led to the establishment of a different factory in 1971 (SpumoTim) - a significant supplier of plastics for Dacia, a car manufacturer in Pitești. The factory relied on Solventul, another local factory, as a key supplier of cyclohexanone acetone. This example illustrates related diversification, in which the chemical sector emerged through successive investments and diversification from the leather, textile, and food industry in the region. According to the core arguments of evolutionary economic geography (Boschma, Coenen, Frenken, & Truffer, 2017) the economic development of a region depends on factors such as existing industrial infrastructure, institutional capacities, tacit knowledge, labour skills, and the legitimacy of economic activity (ACNSAS, 9726, ff 23-8).

The related diversification of industries in Timișoara raises concerns about labour resources. The distribution of employees in terms of human resources

is higher than the national average only in agriculture, including both waged and unwaged work. Despite investments in the industrial sector in Timișoara being below the national average, the systematic investments in machinery and the leather, clothing, food, and industrial printing industries have gradually transformed it into a chemical manufacturing hub. The local labour force was already working in the factories, and as investments refurbished, expanded, and transformed the factories, they were incorporated into the workforce. A significant proportion of the labour force was from adjacent areas of Timișoara.

Internal migration

The migration rates in Romania over the past four decades have varied between 10 and 21 . These rates are relatively low in comparison to Western Europe, where the migration rates in the same period were around 65 . However, the migration patterns in Romania are more nuanced when we disaggregate the migration volumes. The most important migratory flow in Romania was the rural-urban direction, which accounted for between 40% and 60% of the total number of migrants. This is similar to the migration patterns in Western Europe, with the main difference being the urban-urban migration rates, which are significantly higher in Western Europe.

The migration patterns in Romania from 1948 to 1990 can be broken down into three waves. The migration patterns in Romania during this period were complex and influenced by various economic and political factors, including industrialization, collectivization, and foreign loans. While the first wave was largely rural-urban, the subsequent waves saw larger inter-regional and inter-county movements.

The first wave, between 1948 and 1965, was characterised by a significant rural-urban migration trend, with over 52% of the migration flow coming from rural areas to urban centres. This period saw a mix of voluntary and forced migration, driven in part by collectivization in agriculture. There was also a small but important urban-rural reversed migration flow, accounting for less than 21%.

The second wave, from 1971 to 1981, saw two rural migration booms due to explosive population growth in urban areas and excess labour force in rural areas. The distances of migration were much greater, with interregional and inter-county movement increasing. Around 77% of the urban-urban flow was inter-county, driven by educated populations seeking specialised jobs in expanding industries and service sectors.

The third wave, starting in 1981, saw a decrease in rural-urban migration rates as the overall migration rate declined. Migration flows were structured and unequal, with strong inter-regional dynamics. Transylvania and Bucharest attracted migrants from Wallachia and Moldavia.

There were at least three strategies of recruiting labour force based on distance. The first strategy was recruiting at the national level, with inter-regional exchanges. The main counties here are Timiș, Constanța, Brașov, Hunedoara, and Bucharest. Second, there were counties recruiting from adjacent counties: Arad, Prahova, Sibiu, and Argeș. And third, there were counties that used internal workforce pools, such as Cluj and Galați.

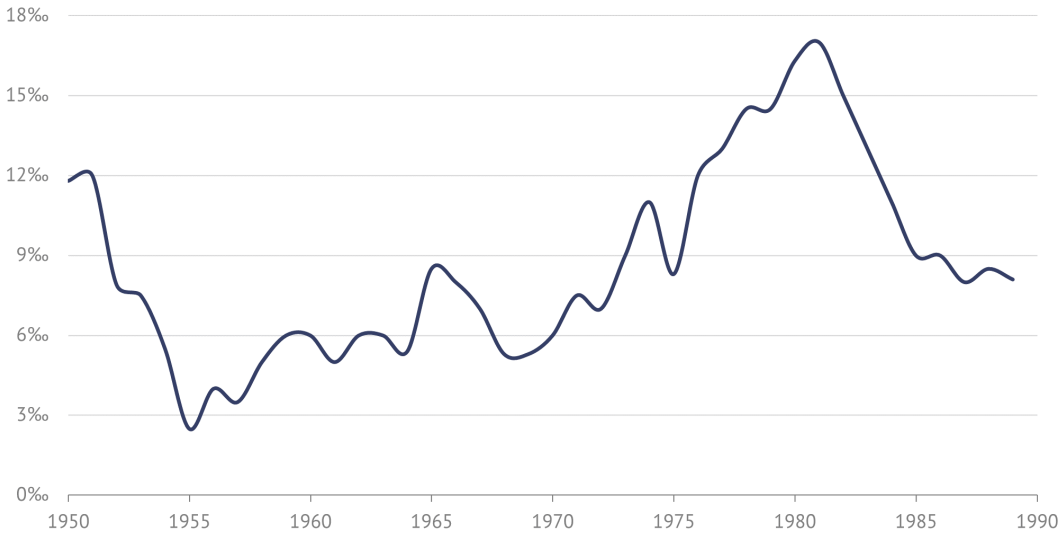
Given the above typology, Timișoara and Cluj, cities of similar size, are at opposite poles. While Timiș ranked second in 1992 in terms of growth due to migration, Cluj had less than one-fifth of its population from other counties.

The migrants in Timiș are from adjacent Western counties and from Transylvania.

The population movements, as captured by the 1966 and 1977 census, followed a logical inter-county network with typical movements between certain counties (1984). Urban centres such as Timișoara, Brașov, and Bucharest attracted the national labour force, but rural to urban migration was fragmented in both years analysed. While there were three large areas with typical movements in 1966, by 1977, there were five areas with more defined polarisation centres. Therefore, migration systems had a regional logic with increasingly predictable destinations. Timișoara attracted population from adjacent areas, yet this triggered chain migration.

Fig. 8
The internal rate of the rural migration between 1950 and 1989

Data source: Rotariu, Mezei (1998); Romanian statistical yearbooks, 1950–1990. Migration rate: migrants per 1.000 inhabitants.



Tab. 10 —Top counties by the percentage of the population who was not born in the county of residence.

Data source: Population and housing census, 1966, 1977, 1992; Table Source: Rotariu & Mezei (1998).

County/Capital	Rank	1977	1992
Bucharest	1	59.1%	43.4%
Timiș	2	34.4%	37.2%
Brașov	3	41.9%	35.1%
Hunedoara	4	36.3%	33.2%
Constanța	5	35.5%	30.6%
Caraș-Severin	6	23.6%	23.5%
Arad	7	20.4%	23.2%
Sibiu	8	23.6%	23.0%
Galați	19	18.1%	16.6%
Cluj	10	19.0%	16.2%

Fig. 9
The main inter-county flows towards urban areas, 1966 (lifetime migration)

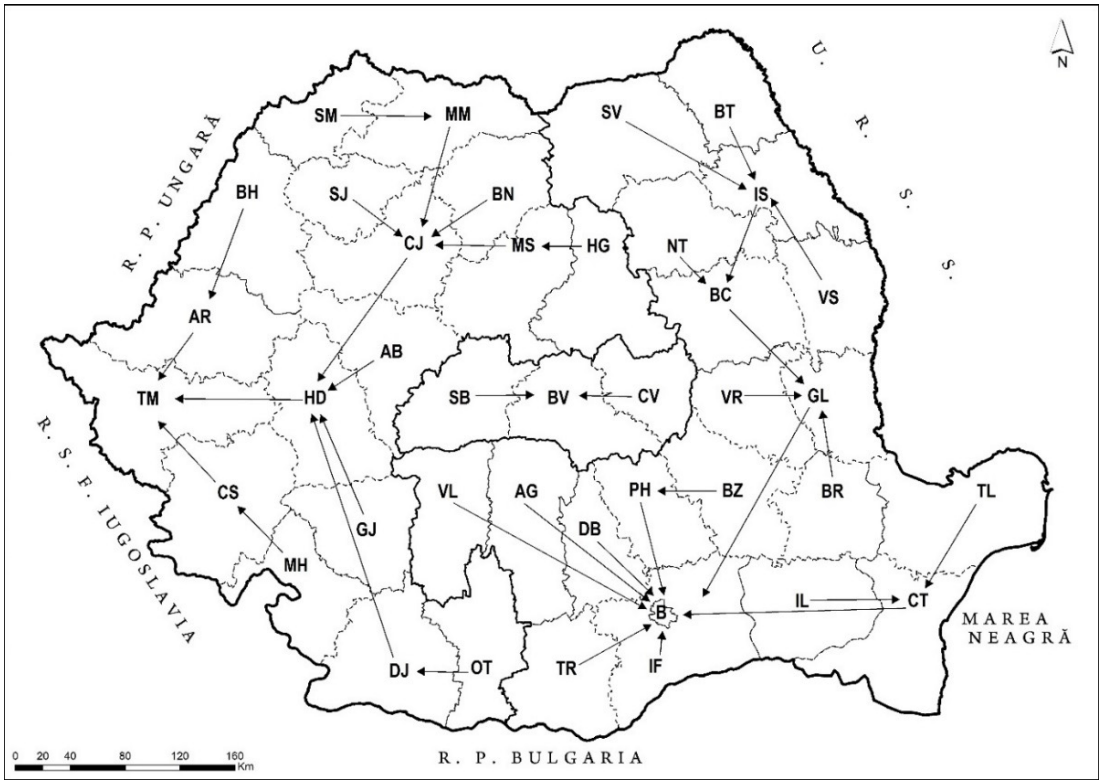


Fig. 10
The main inter-county flows towards urban areas, 1977 (lifetime migration)

Source: Sandu (1984)

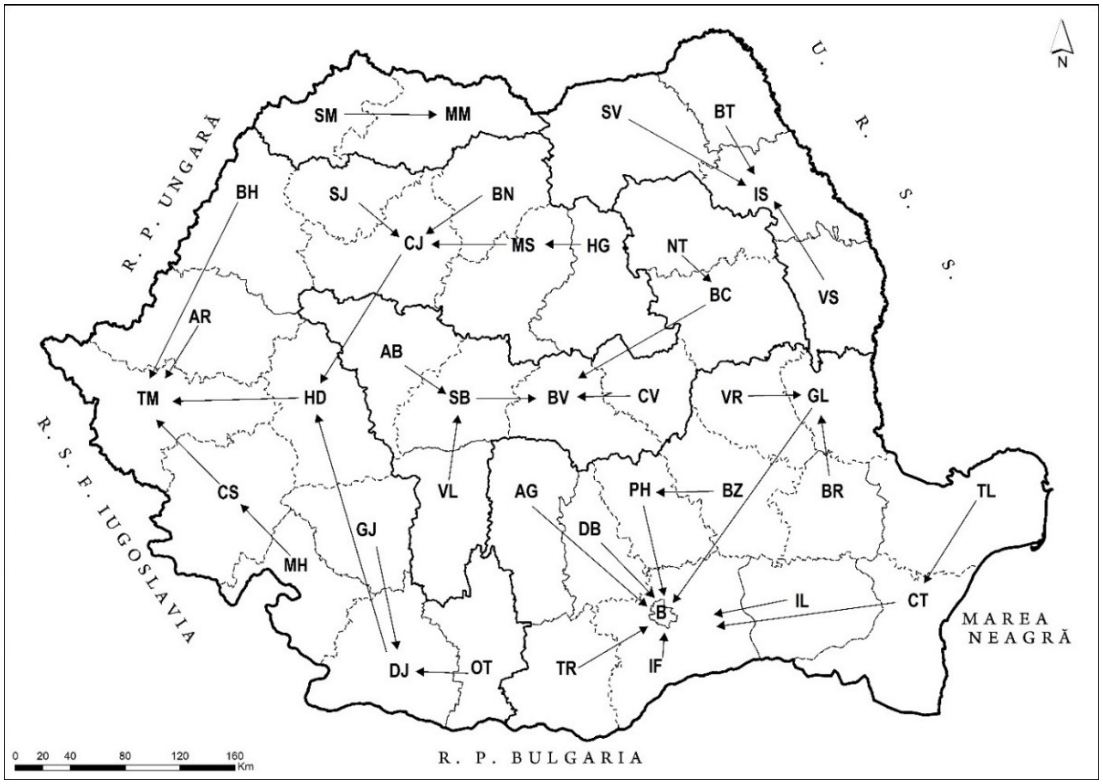
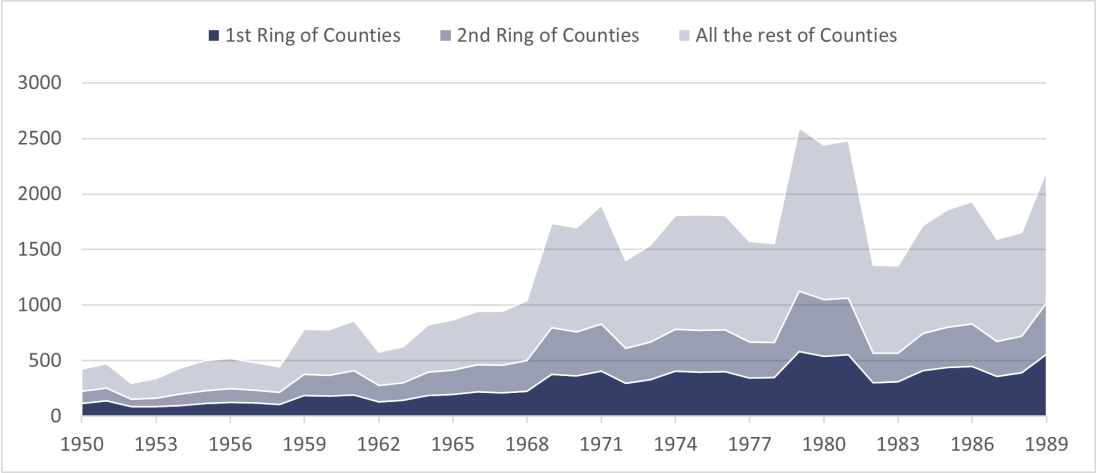


Fig. 11
Immigrants to Timișoara from other municipalities and regions between 1950-1990, at the 2011 Census.

Data source: Data census 2011.

Fig. 12
Immigrants to Timișoara from other municipalities between 1950-1989, by year, at the 2011 Census. Moving averages for a window of three previous years.

Data source: Data census 2011



Economic restructuring 1990-2021

Population Decline, Employment Patterns, and Foreign Direct Investments in the Post-Socialist Era

This section examines the economic restructuring of Romania from 1990 to 2021, with a focus on the post-socialist Timișoara. The research delves into three key aspects: population decline, employment patterns, and foreign direct investments (FDI). During the 1990s, Romania, Timișoara included, experienced a consistent decline in population, leading to a significant decrease in overall employment levels. The employment rate among the working-age population remained relatively stable, influenced by strong migration flows related to work. Internal migration was predominant in the 1990s, shifting to external destinations, particularly Western Europe, after Romania's accession to the European Union. The spatial distribution of employment varied significantly across different regions, with counties emphasising diverse industries and services better maintaining jobs. Moreover, the study analyses the impact of FDI on Romania's export-oriented growth model, with the industry and business services sectors being significant beneficiaries of FDI. Timiș emerged as a prominent destination for FDI in Romania outside the capital, attracting investments in the automotive and industrial sectors. The research contributes to a better understanding of Romania's economic transformation in the post-socialist era and highlights the role of FDI in shaping the country's export-oriented development.

Economic contraction

During the 1990s, Eastern Europe experienced a consistent decline in population (Neyer, Andersson, Kulu, Bernardi, & Bühler, 2013), which is considered one of the most enduring population shrinkages in the postwar era of the 20th century (Romei, 2016). This trend was accompanied by a significant decrease in overall employment levels (Bell & Mickiewicz, 2013). Romania, like other countries in the region, also witnessed a dramatic decrease in the number of wage earners over the past few decades (Ban, 2016; Petrovici, 2013).

The decline in employment began during the last five years of socialist governance, with the share of employees among the total population dropping from 42 percent in 1985 to 35 percent in 1990.

Another significant drop of 13 percent occurred in the 1990s, stabilising around 20-22 percent decrease compared to 1990 in the 2000s. However, despite the decline in aggregate employment, the employment rate among the working-age population remained relatively stable at around 40 percent. A significant factor contributing to this employment pattern is the strong migration flow related to work (Rees & Kupiszewski, 1999). In the 1990s, Romania experienced significant internal migration, with people moving from urban to rural areas and engaging in self-employment and family-based agricultural work (Traian Rotariu & Mezei, 1998).

However, in the 2000s, migration shifted towards external destinations, particularly Western Europe, where Romanians sought low-paying jobs in both formal and informal secondary markets (Andrén & Roman, 2016). The wave of international migration intensified further following the 2008 crisis and Romania's accession to the European Union (Cosma, Ban, & Gabor, 2020).

The spatial legacy of socialist investments. During the 1990s, the decline in aggregate employment in Romania varied significantly across different regions. Most employees were concentrated in urban areas, where they accounted for nearly 40 percent of the population. Moreover, more than half of the employed population was concentrated in the top ten most developed counties out of the total 41. While some counties experienced significant losses in both population and jobs, others were able to recover more swiftly during the second post-socialist decade, despite facing economic contraction.

For instance, Călărași County, the county that received during socialism most investments in agriculture, by 2001 had an 84% drop in the number of employees. On the other hand, Timiș County experienced a milder decline, with the total number of employees decreasing 37% percent from 1990 to 2001.

The discrepancy in job losses can be attributed to the investment strategies implemented during the socialist period and the composition of the manufacturing sector. Counties that received significant investments in agriculture during that time experienced the most substantial decline in employment. Conversely, counties that emphasised a diverse industry and services were

able to maintain a higher percentage of employees during the post-socialist years.

This situation presents a paradox since, under socialism, many employees were urban industrial workers, and one would expect that the transition away from socialism would pose a threat to these workers' employment prospects.

Fig. 13
Contraction of the percentage of employees in Timiș, by municipality type compared with 1991 in the first two post-socialist decades.

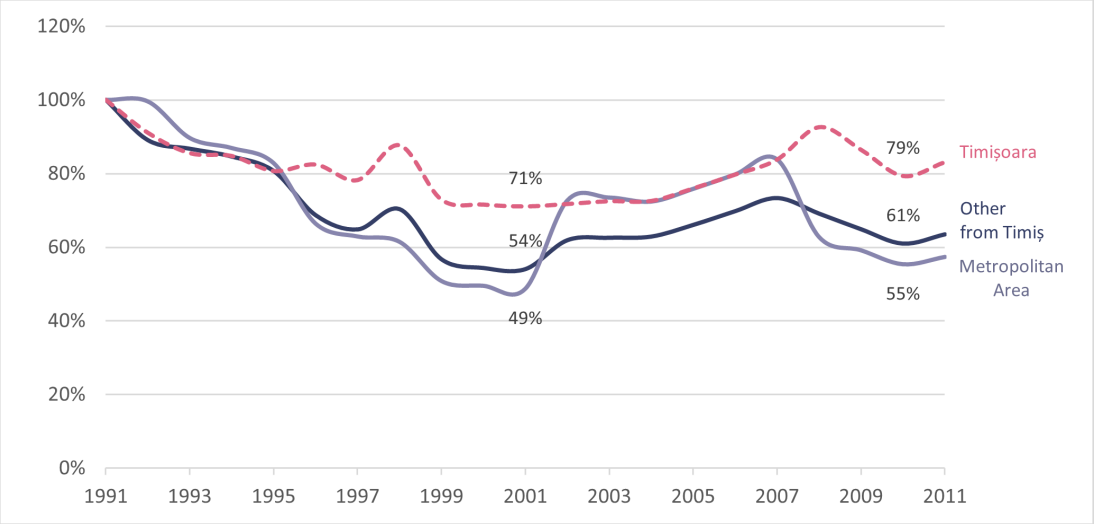
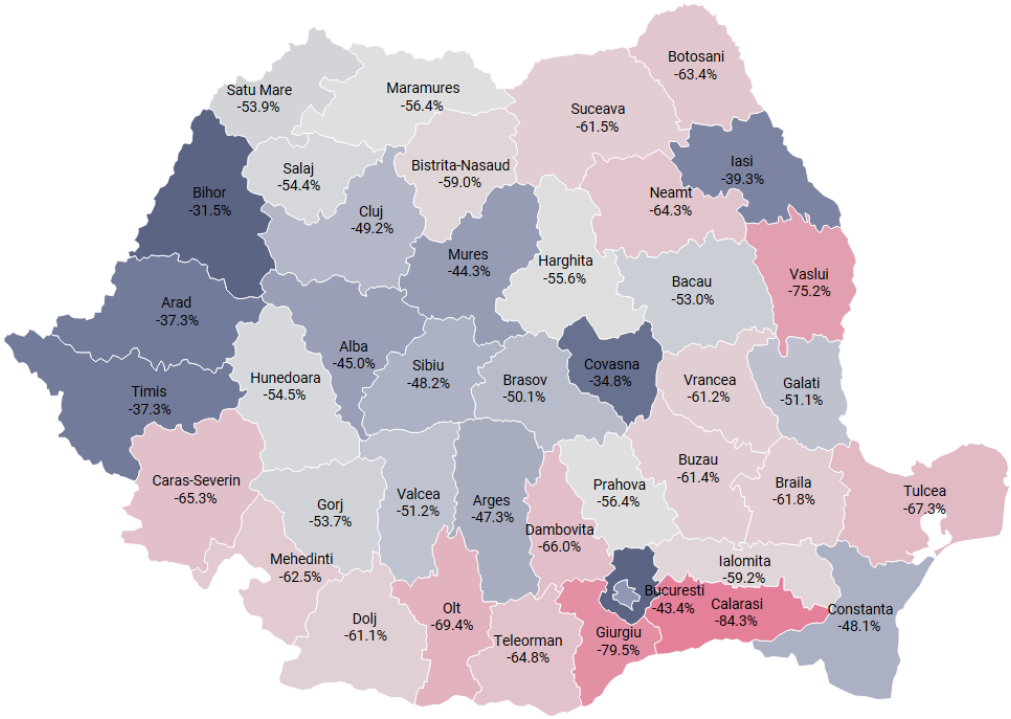


Fig. 14
Job losses by county in 2001 compared to the number of employees in 1991.

Data source: Romanian Institute of Statistics, Tempo FOM104D



To better comprehend the paradox, we can examine two significant policy concepts mentioned earlier that influenced investment patterns in Romania and shaped the spatial distribution of labour: commune formation and urban zone formation.

Firstly, during the socialist era, agricultural work predominantly took place in cooperatives, where compensation was provided in the form of products and money based on sales and state acquisitions, rather than regular wages. However, after the collapse of socialism, the counties that experienced the most severe job losses were not those with the highest number of employees but rather those specialising in agriculture and having a smaller workforce.

Secondly, the notion of an urban zone referred to the surrounding areas of an urban centre, which relied on rural regions as supply sources for raw materials and labour. Investments were driven by local natural resources and previous investments made prior to socialism, aiming to establish value chains based on input-output networks connecting urban industries with rural sectors such as mining, forestry, and agriculture.

As a result of these policies, counties that benefited from industrial investments developed a more economically integrated settlement system, while counties that received agricultural investments had a less cohesive settlement structure. Also, the settlement structure was more integrated if the rural-urban divide was bridged by local supply chains across the local industry.

Timiș and Călărași, both recipients of significant agricultural investments during socialism, had distinct supply chains. While Călărași (Steel Mill Călărași—Siderca) experienced heavy industry investments in the late 1970s, the urban industry remained disconnected from the rural hinterlands focused on grain production and livestock. Supply networks, coordinated nationally, became uncertain after the collapse of centralised planning, affecting factories lacking local integration with their hinterlands.

On the other hand, Timiș County emerged as an important recipient of industrial investments that continued the interwar tradition of interlinking the rural hinterland with the urban network creating a strong network of interconnected input-output industries in satellite towns centred around Timișoara. Timiș County's rural agricultural production was highly integrated within the urban industrial circuits.

The failure of some supply chains in the post-1990s era reveals the importance of economic policies and supply chain integration. Solventul, a Timișoara based petrochemical plant, serves as an example (Jigoria-Oprea & Popa, 2016; Voiculescu & Jucu, 2014). Originally transformed into a chemical factory in 1974, Solventul aimed to process crude oil resources in the Banat region, developed also in the 1970s. Collaboration between Romania and Yugoslavia, supported by COMECON complementary infrastructure, allowed for joint oil refining processes. The plant from Pančevo handled primary processing, while Solventul focused on secondary processing. Solventul found success in the Chinese market, particularly with plasticizers. However, the dissolution of COMECON in 1991 and the subsequent embargo on Serbia disrupted Solventul's production arrangements. This situation favoured competitors like

BASF, the leading German chemical manufacturer, which captured the Chinese plasticizer market, leaving Solventul struggling to compete. Consequently, Solventul was forced to import petrochemical products, including plasticizers. These challenges severely impacted Solventul's operations, ultimately leading to its closure.

Tab. 11
Employees change county level in Romania: linear regression (OLS).

*** p ≤ 0.001
** p ≤ 0.010
* p ≤ 0.050.

Factors	**1992-2001**	**2002-2008**	**2009-2011**	**2012-2022**
Employees in FDI companies	1.787** (0.557)	0.844** (0.252)	0.508** (0.150)	0.357* (0.170)
Socialist Investments Index 1950-1985 (-1 agriculture, 0 services, 1 industry)	0.051** (0.015)	0.042** (0.015)	0.001 (0.006)	0.009 (0.010)
Socialist Investment Diversification 1950-1985	0.161 (0.123)	0.193 (0.120)	-0.013 (0.046)	0.216** (0.076)
Employee diversification in manufacturing 1985	0.005 (0.138)	-0.010 (0.137)	0.005 (0.138)	0.051 (0.094)
Intercept	-0.621*** (0.025)	-0.003 (0.018)	-0.621*** (0.025)	-0.098*** (0.022)
Fit Measures				
Adjusted R^2	0.352	0.359	0.162	0.180
RMSE	0.094	0.093	0.036	0.060

Employees in foreign companies

Since 1997, there has been a steady increase in the proportion of Romanian employees working in companies owned by foreign investors. This growth can be attributed to the first wave of privatisation of state-owned companies. However, these foreign direct investments (FDI) were mainly concentrated in specific regions, namely the capital city and its surrounding area (Ilfov), as well as the western part of Romania (Timiș, Arad, and Bihor). Among these regions, Timiș stood out as the county receiving the highest amount of FDI.

A new wave of significant FDI occurred in 2004 when Romania joined the North Atlantic Treaty Organization and gained approval to join the European Union. This influx of investments continued until the 2008 Global Financial Crisis. Throughout this period, Central and Eastern Europe witnessed a concentration of foreign direct investments in the manufacturing and service sectors (Castellani, Marin, Montresor, & Zanfei, 2022). Specifically, the manufacturing sector attracted numerous greenfield plants that aimed to capitalise on a low- and middle-skilled workforce while serving as an export platform for the EU15 markets (Jones, Serwicka, & Wren, 2020). Amid this FDI wave, two counties in the southern region experienced substantial investments: Argeș in the automotive industry and Ploiești in the petrochemical industry. Additionally, the western counties and the rest of Transylvania also joined in benefiting from these investments.

Since 2011, there has been a notable rise in the outsourcing of non-manual work in Central and Eastern Europe, particularly within the emerging business services sector (Oshri, Kotlarsky, & Willcocks, 2015; Peck, 2018). This trend is evident in the growing preference for Business Process Outsourcing (BPO) and Knowledge Process Outsourcing (KPO). Business services encompass various activities such as information and communication, financial and insurance activities, real estate activities, professional, scientific, and technical activities, as well as administrative and support service activities. Between 2011 and 2020, the cities of Bucharest and Cluj emerged as the primary beneficiaries of these types of investments in the business services sector. Additionally, Timișoara ranked third in terms of FDI in services, while Iași secured the fourth position. These cities attracted significant foreign direct investments and witnessed substantial growth in the outsourcing of non-manual work.

By 2021, the Timișoara Metropolitan Area had a turnover of 71.622 million lei, which constituted 3.9% of the national total. Cluj and Iasi yielded 63.941 million lei and 35.399 million lei, respectively, while Bucharest exhibited the highest turnover of 570.212 million lei, representing 30.9% of the national total. Companies with over 50% foreign ownership accounted for 5.9% of the Timișoara Metropolitan Area and constituted 62.78% of the total number of employees and 69.28% of the area's turnover. The industrial sector dominated the Timișoara Metro's economy, comprising 52.0% of its total turnover, while this percentage stood at 41.5% in Cluj, 36.6% in Iasi, and 28.8% in Bucharest. Additionally, the automotive sector represented 29.61% of the turnover in the

Timișoara Metro, while this percentage was 5.2% in Cluj, 1.4% in Iasi, and 0.5% in Bucharest.

When it comes to the manufacturing industry, 38% of the turnover in the Timișoara Metro belonged to this sector, equivalent to 28 billion lei. This percentage was 19.1% in Cluj, 19.0% in Iasi, and 9.2% in Bucharest. In terms of the distribution of employees, 48.56% of them worked in the industrial sector in the Timișoara Metro. This percentage was slightly lower in Cluj, at 44.5%, and Iasi, at 44.9%, while Bucharest had the lowest percentage of 31.4%.

Fig. 15
Percentage of employees in companies completely own by foreign capital, top five counties, 1995-2022.

Data source: INS Tempo FOM104B

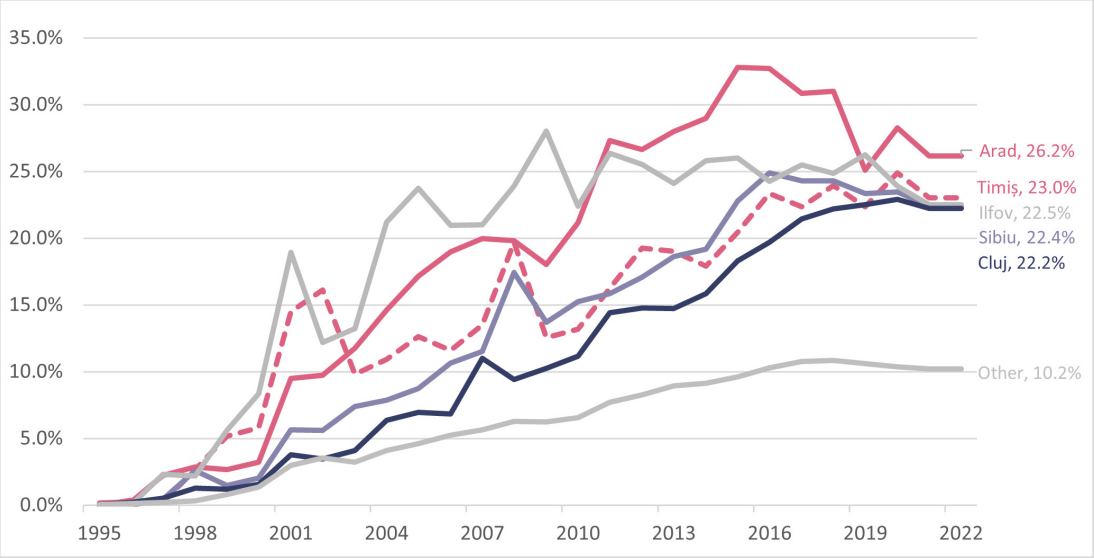


Fig. 16
Percentage of employees in companies completely own by foreign capital, top five counties, 2002.

Data source: INS Tempo FOM104B.

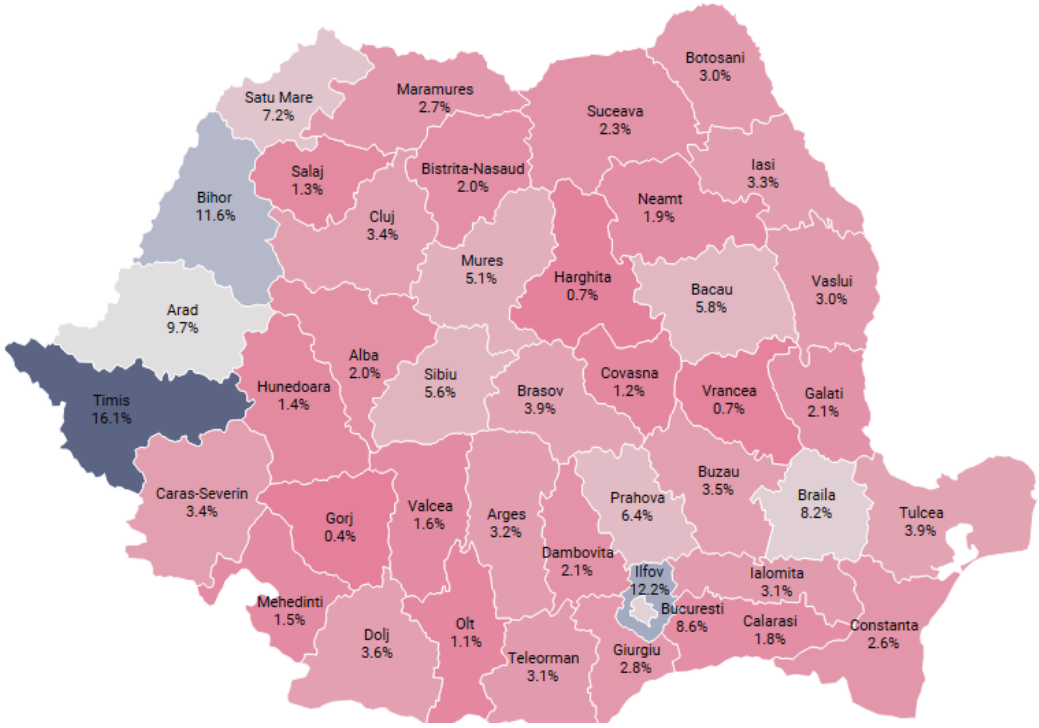


Fig. 17
Percentage of employees in companies completely own by foreign capital, top five counties, 2008.

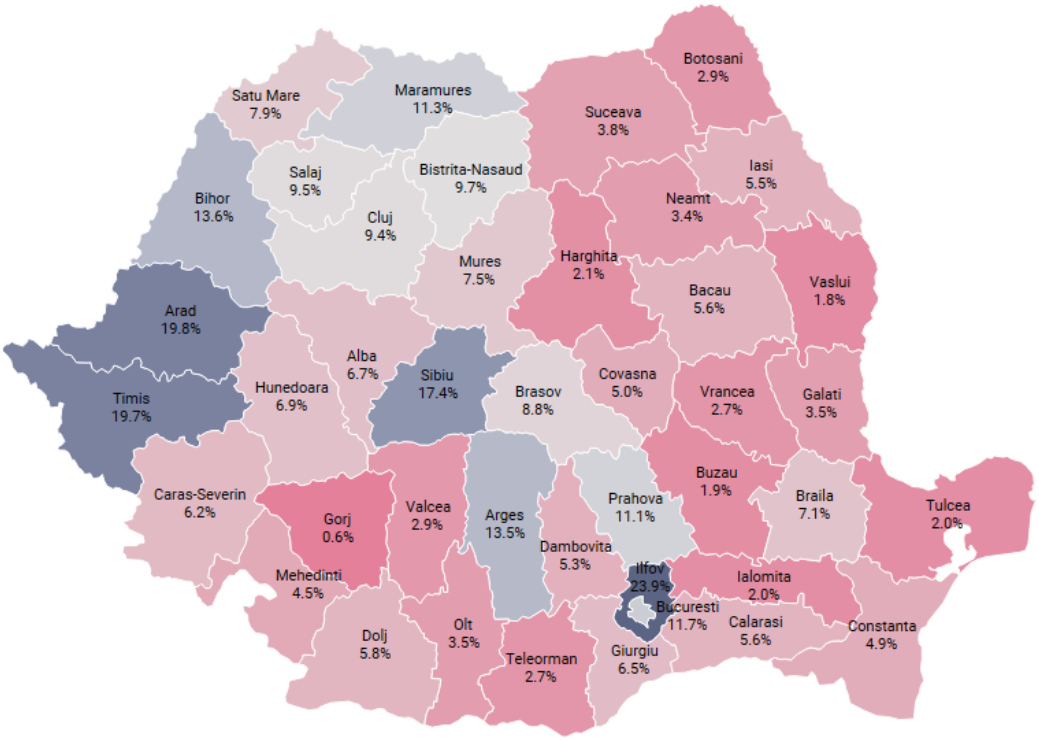
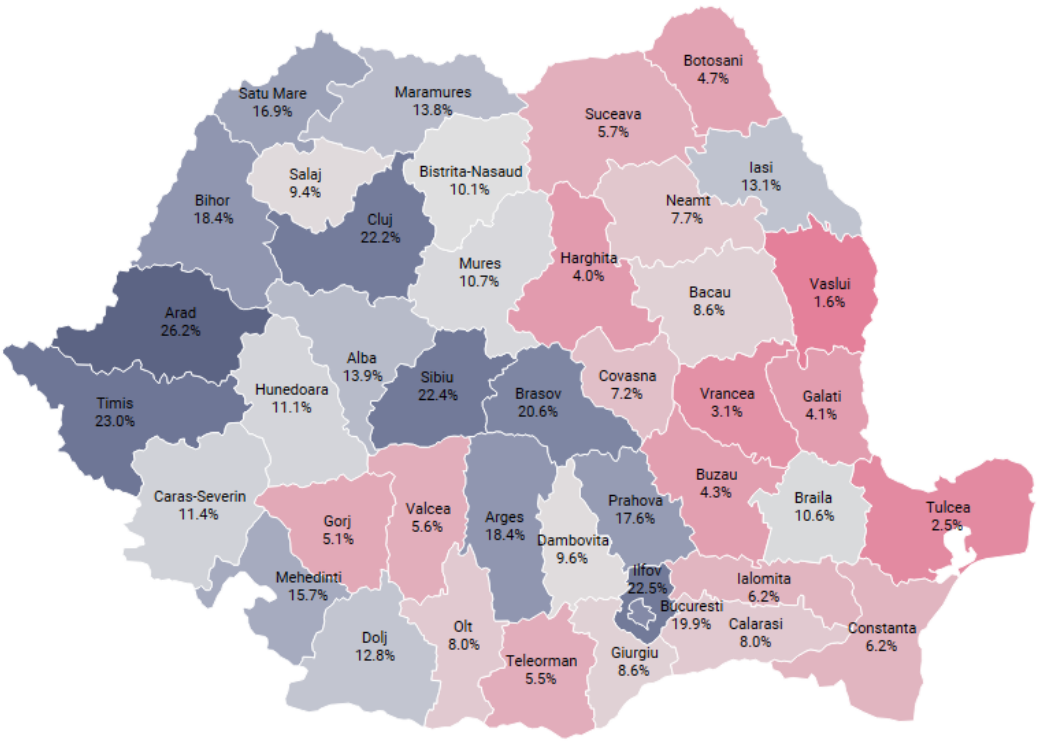


Fig. 18
Percentage of employees in companies completely own by foreign capital, top five counties, 2022.



Exports

Central and Eastern Europe has a distinctive dependent variety of capitalism (Nölke & Vliegenthart, 2009) and export-oriented foreign direct investment (Ban & Adăscăliței, 2022), which is a key enabler of the cost competitiveness of West European-centric global value chains relative to their global rivals (Baccaro, Blyth, & Pontusson, 2022). CEE's FDI-led growth model is dependent on the multinational corporations that own the industrial core of the region and insert it into complex global value chains (Christophers, 2022; Peck, 2018).

Romania is a major destination for Western European outsourcing, which is mainly focused on the secondary service sector (Ban & Adăscăliței, 2022). Romania heavily relies on exports, specifically product and secondary service exports, which contribute between 50% and 66% of its GDP since 2000. The country has been affected by two waves of outsourcing. The first (1995-2008) was characterised by industrial outsourcing and mainly focused on unskilled labour, while the second wave (2011-2022, driven by labour arbitrage over highly skilled and qualified labour, involves the relocation of corporate support processes, including service outsourcing.

In 1995, Romania exported products worth $9 billion and services worth $1 billion, accounting for 32% and 4%, respectively, of the GDP. In the following years, both product and service trade continued to grow, with a steady increase in the proportion of exports as a percentage of GDP.

By 2004, Romania's total exports had reached $35 billion, with $26 billion worth of products and $9 billion worth of services. This constituted 85% of the total trade GDP. In the subsequent years, the proportion of service exports grew, albeit at a slower pace compared to product exports.

In 2020, Romania exported products worth $73 billion and services worth $18 billion, accounting for 45% and 11%, respectively, of the GDP. The total trade GDP stood at 56% in 2020. The data suggests that Romania's export sector has shown considerable growth over the years, with a steady increase in the proportion of exports as a percentage of GDP.

Timiș, in terms of export performance, consistently outperformed other regions, with the highest export-to-GDP ratio in all years except for product trade in 2021. This indicates that a significant portion of Timiș's GDP comes from exports. While Timiș ranks third in terms of the euro value of exports, it trails only behind Bucharest and Ilfov.

Bucharest had the second-highest export-to-GDP ratio for most years, but in 2021, its ratio of 23% suggests relatively weaker export performance compared to other metropolitan areas. Cluj and Iasi had similar export-to-GDP ratios throughout the period, with Cluj performing slightly better in some years. In 2021, Cluj exhibited the highest ratio of 19% among the two regions.

However, if service exports are also considered, Bucharest and Cluj outperform Timiș. Unfortunately, service exports are not reported at the regional level

in Romania, except for the period between 2011 and 2017 by the National Bank of Romania. In 2017, Timiș ranked fourth in terms of regional-level service exports.

Fig. 19
Romanian's export grow and the proportion of export out of GPD, 1995-2021, in billions of USD.

Data Source: The Observatory of Economic Complexity, 2022

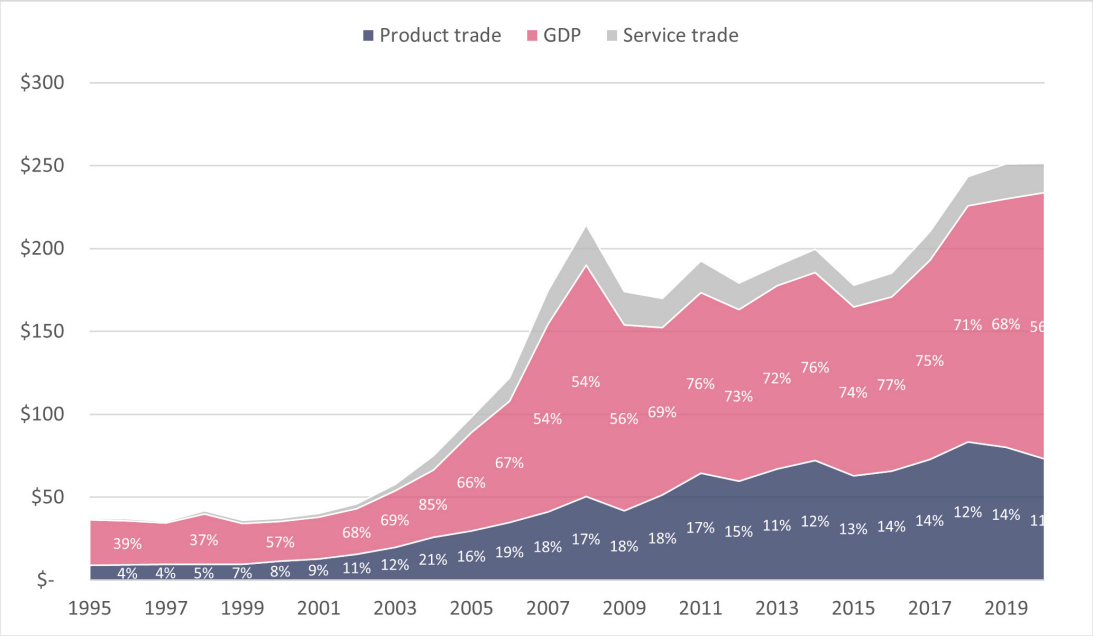
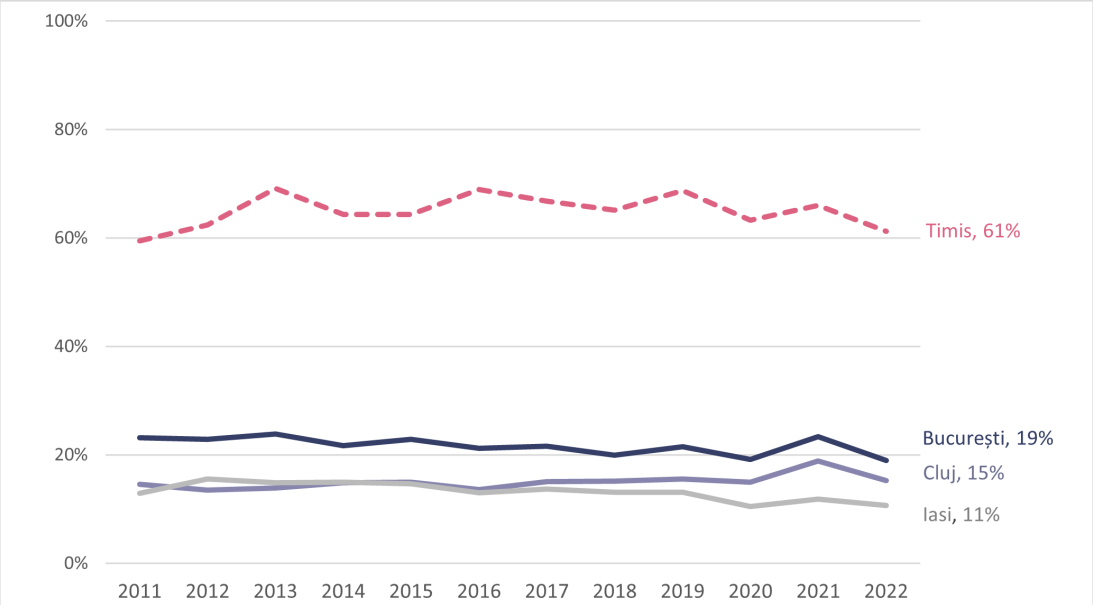


Fig. 20
Product exports as a percentage of GDP, 2011-2021.

Data Source: RNIS, EXP101J, CON103I



Foreign Direct Investments

Between 2013 and 2021, there was a consistent rise in both the value and complexity of exports from Romania. A significant proportion of these exports, fluctuating between 54% in 2014 and 71% in 2021, were done by firms entirely owned by foreign capital. By the year 2021, the complexity of Romanian exports had surpassed that of Denmark and was only marginally inferior to that of Poland and the Netherlands.

Mixed capital has remained relatively stable during this period, accounting for 14% to 16% of exports. In 2021, 86% of Romania's exports were conducted by fully or partially foreign-owned companies, indicating the dominance of foreign capital in the country's export sector.

On the other hand, the share of exports by domestic capital has fluctuated significantly, with its lowest point of 9% in 2020 and the highest point of 30% in 2014. Unknown capital accounts for a small proportion of exports, ranging from 2% to 4% over the years.

Foreign direct investment (FDI) is a significant source of capital inflows for Romania, particularly through foreign-owned capital companies. The total FDI stock in Romania went from €59,126 million in 2012, to €95,547 million in 2021, a 70% increase. On average, the FDI balance in the Gross Domestic Product was 41.6% during this period, and 41.8% in 2021.

The industry sector had the highest proportion of FDI in Romania for most years, ranging from 41% to 48% between 2012 and 2021. The construction and real estate sector saw an increase in its proportion of FDI from 9% in 2012 to 17% in 2018, where it remained steady in 2021. Retail and logistics also experienced an increase in its proportion of FDI from 13% in 2012 to 19% in 2021.

On the other hand, the agribusiness sector has remained relatively stable, with FDI ranging from 2% to 3% throughout the period. The business services sector has seen a decline in its proportion of FDI from 29% in 2012 to 21% in 2021, although it remains one of the top sectors for FDI in Romania.

It is important to note that there are fluctuations in the FDI by sector from year to year. For example, the industry sector saw a decline in its proportion of FDI from 48% in 2013 to 44% in 2015, before gradually increasing again in later years. Similarly, the business services sector saw a peak in its proportion of FDI in 2012, before declining in the following years.

In the period spanning 2013 to 2021, Timiș ranks third in Romania for attracting Foreign Direct Investment (FDI), following Bucharest and Ilfov. The share of FDI in Timiș has varied, reaching 5.62% in 2017 and declining to 5.01% in 2021. Notably, there was a contraction in the FDI proportion from 5.62% in 2017 to 5.31% in 2019. This trend persisted, albeit modestly, with a further decline to 5.26% in 2020 and eventually to 5.01% in 2021. Despite the recent downward trend in FDI in Timiș, the region continues to be one of the leading FDI destinations in Romania, excluding the capital.

Fig. 21
Exports by capital's origin from Romania, 2013-2021

Data Source: Romanian National Institute of Statistics: EXP101R

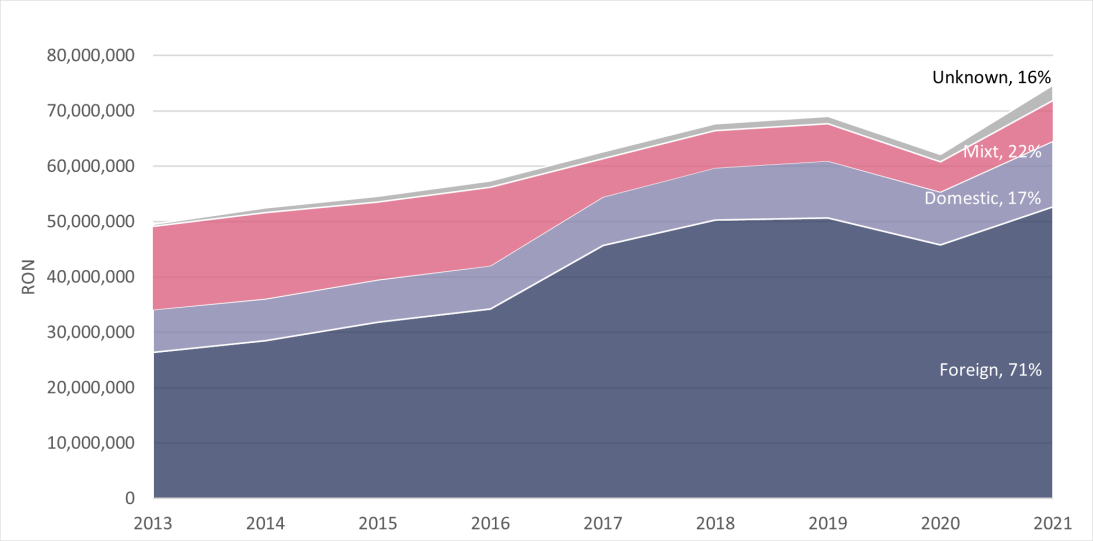


Fig. 22
Romanian's economic complexity growth of exports, 1995-2021

Image Source: The Observatory of Economic Complexity, 2022.

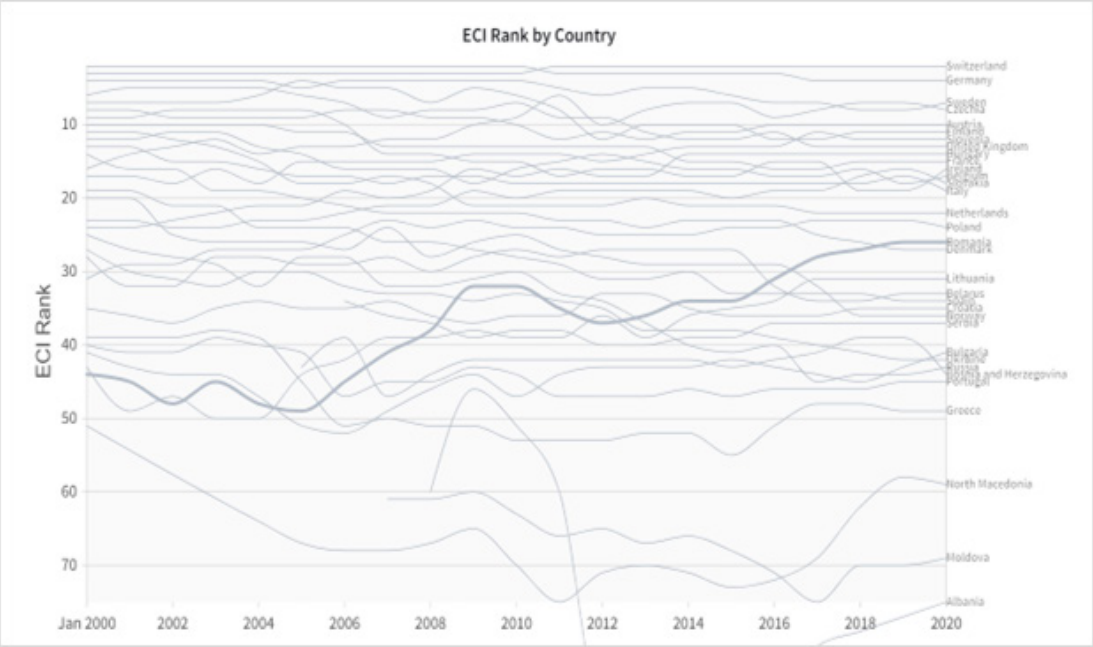


Fig. 23
The share of Foreign Direct Investments by county in Romania, 2021

Data Source: National Bank of Romania, FDI Yearly Report 2022

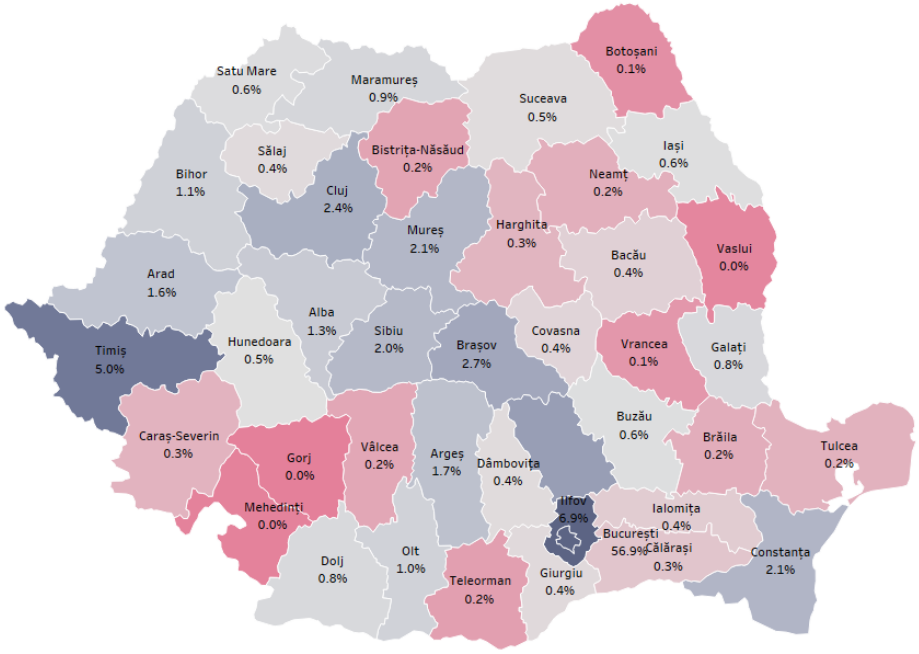


Fig. 24
Foreign Direct Investments by sector, 2011-2021

Data Source: National Bank of Romania, 2022.

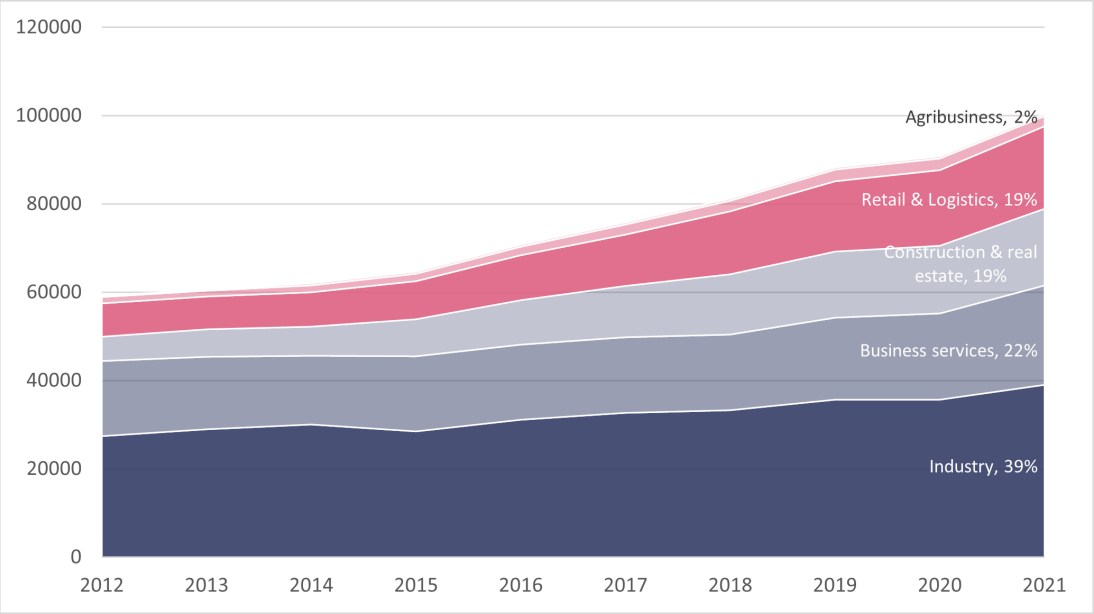


Fig. 25
Rank of county in terms of FDI 2013-2021

Data Source: National Bank of Romania, 2022

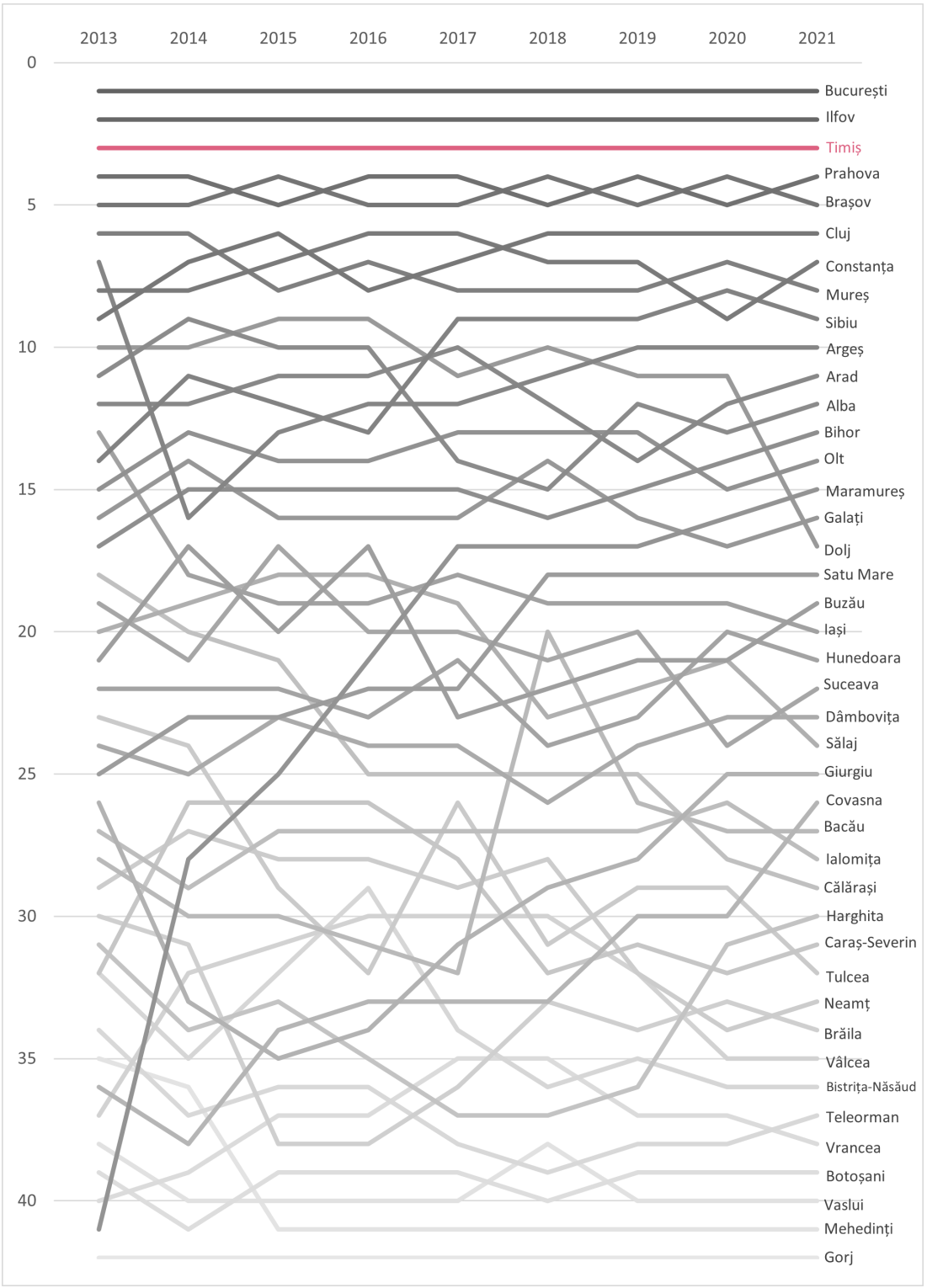


Fig. 26
Network of exports of largest 77 industrial companies in Timiș based on the employees (above 300T)

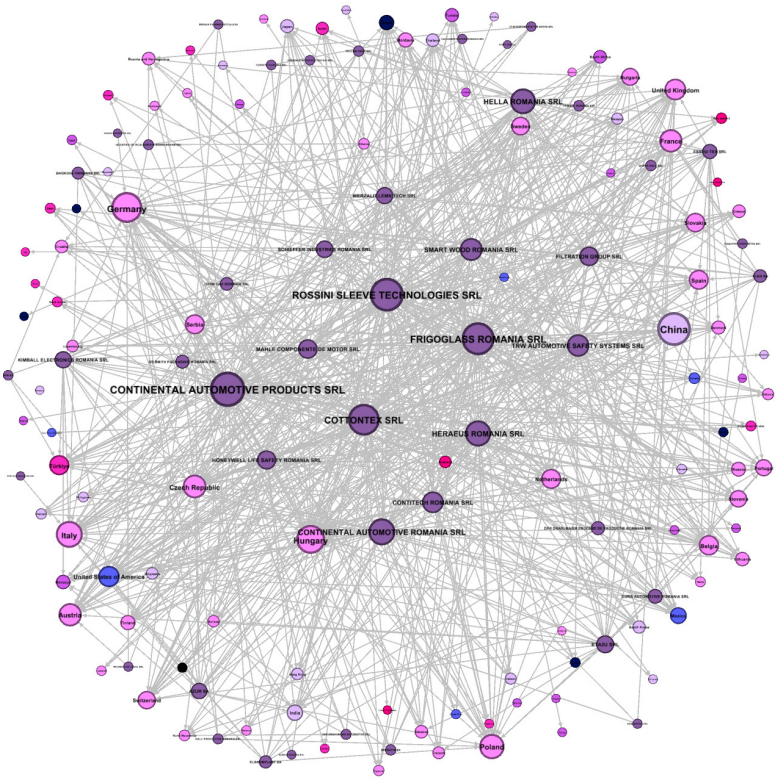
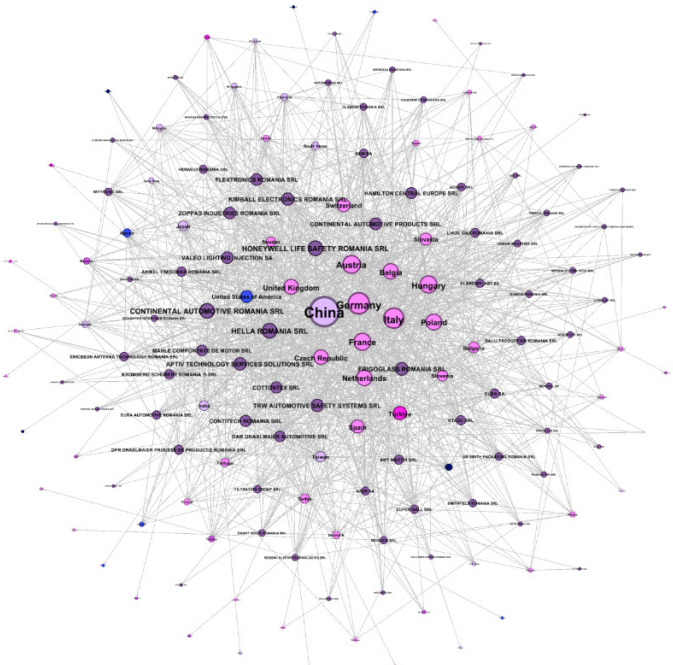


Fig. 27
Network of imports of largest 77 industrial companies in Timiș based on the employees (above 300T)



Economic structure 2022

A Regional Command-and-Control Centre for Manufacturing and Services

The chapter provides an analysis of the economic structure of Timișoara in 2022. It highlights the city's emergence as a destination for foreign capital in the manufacturing and commercial services sectors. Timișoara attracted a substantial portion of foreign direct investment, particularly in the manufacturing industry with a medium to high level of technological sophistication. The service sector dominates, with trade activities contributing significantly to the total turnover. We also examine the employed and salaried population, with Timișoara being the second-largest centre for labour resources after Bucharest. The labour market structure shows a high concentration of employees in the industrial and service sectors. The city exhibits a distinct economic profile compared to other regions, with a low level of similarity to the national economy. Timișoara is identified as a command-and-control centre for the region, with a significant number of management and specialist positions. Overall, the study sheds light on Timișoara's economic dynamics and its role in the national and regional economy.

At a continental level, Central and Eastern Europe have capitalised on the outsourcing of production and business processes of Western European companies, as indicated by Ban (2019). Romania has been one of the beneficiaries of this trend and has emerged as a destination for foreign capital in both the manufacturing and commercial services sectors, particularly after 2011. According to INS Tempo FOM104B, in 2021, 26% of employees in Romania's private sector were employed by companies with full foreign capital. These companies accounted for 52% of the total aggregated turnover and 45% of the total gross value added (Cristescu, 2022:3). Furthermore, the manufacturing sector employed 45% of its workforce in companies with foreign capital, which generated 68% of the sector's aggregate turnover (Cristescu, 2022:3).

By 2021, Timiș succeeded in attracting a substantial portion of foreign direct investment, amounting to €4,788 million, which represents 5% of the total balance of such investments in Romania (NBR, 2021). This achievement enabled Timiș to maintain its third-place ranking, a position it has held for over a decade, with only Bucharest and Ilfov attracting a higher cumulative percentage of foreign direct investment (63%). Notably, the manufacturing industry was the primary beneficiary of foreign investment, accounting for 39% of the total balance. Of these investments, 44.3% were allocated to industries with a medium to high level of technological sophistication (NBR, 2021). During the most recent cycle of economic development spanning from 2011 to 2021, greater Timișoara has successfully leveraged foreign direct investment in the industrial sector, with a particular focus on manufacturing industries with a medium to high level of technological sophistication.

Within the realm of statistical categorisation, the service sector is divided into multiple expansive sub-categories, encompassing trade, transport and warehousing, business/commercial services, and public/social services. Utilising this classification, services appear as the predominant category, with trade activities constituting the largest share of turnover in both Timișoara and Greater Timișoara, making up approximately 43% of the total. However, for the purposes of this analysis, we will employ a more restrictive definition of the service sector, limiting it to social services and business services. The majority of social services are publicly operated, whereas business services are predominantly private and contribute merely 12% to the total aggregated turnover from services. In contrast, in other significant urban centres like Bucharest, Iași, and Cluj-Napoca, these sub-sectors are economically substantial, contributing to 20% of the total service turnover. Despite Timișoara adopting a similar developmental strategy for business services, it lags behind these other urban centres. This discrepancy, however, is largely a statistical artefact, as many of Timișoara's business services are captive centres that are categorised as industrial due to the parent company being registered under a manufacturing NACE code.

Nevertheless, the Timișoara Metropolitan Area boasts a distinctive economic profile, largely due to its combination of economic resources, primarily in the manufacturing industry and, to a lesser extent, commercial services. This profile sets it apart not only from the national economy (as evidenced by the Hirsch index, which highlights a lack of strong similarity), but also from other metropolitan areas centred around urban growth poles in Romania. As a result, Timiș is the second largest centre in terms of volume of the labour resource, after Bucharest, with 476 thousand people and the second in absolute volume of employees and employed persons. Also, Timiș is the third county (after Bucharest and Cluj) with the highest proportion of employees (55%) and employed people (68%) of the total volume of labour resources.

Employed and salaried population

The term 'labour resources' as used by the National Institute of Statistics, captures not merely individuals within the working age bracket who are fit for employment, but also those either younger or older who are nonetheless actively participating in the labour market. Within this group, 261,000 individuals serve as salaried employees, comprising 55% of the total workforce; 9,700 function as employers, representing 2%; and 51,200 are either self-employed or unpaid family workers, contributing to 11% of the workforce. Consequently, 68% of the total labour resources in Timiș County are actively engaged in employment.

Timiș County is the third county (after Bucharest and Cluj) with the most intensive use of employed persons (with 68%) of the total volume of county labour resources. However, Timiș County has the second largest volume of labour resources, after Bucharest, with 476 thousand people.

Waged work can be calculated based on their domicile or the domicile of the firm in which they are employed. The first source of data is the survey of employees conducted by the National Institute of Statistics, while the second source is the Territorial Labor Inspectorate, which can provide information at the company level. The same information can also be found on the governmental portal data.gov.org, but this data does not include public employers. The differences between the two sources of data are relatively minor. In 2021, the National Institute of Statistics indicated 122 thousand salaried individuals in Timișoara and 170 thousand in the Greater Timișoara Area. In the same year, the Timiș Territorial Labor Inspectorate indicated 130 thousand salaried individuals in Timișoara and 179 thousand salaried individuals in the Greater Timișoara Area.

The municipality of Timișoara has the highest number of salaried workers in the county, due to the large number of companies and institutions headquartered here. When considering the economic sectors in Timișoara, we find that most employees work in services and industry, particularly in the automotive sector (with major employers such as Continental and Hella). It is worth noting that not all employees in these sectors may be salaried workers, as some may be paid hourly or receive commission-based compensation.

The peri-urban municipality of Giroc has the second-largest number of employees in Greater Timișoara, who mainly work in the industrial area at Incontro Industrial Park situated in Chișoda. Sânandrei is another municipality with a high number of employees, primarily consisting of labourers from the Artemis Industrial Park, Ipso Timișoara, B. Braun Pharmaceuticals, or Simultan. Meanwhile, Dumbrăvița presents a considerable cohort of employees at the Greater Timișoara level, with its principal employers functioning within specialised economic sectors, including logistics and transport. Ghiroda, along with the component village of Giarmata, also counts among the municipalities with the highest number of employees in Greater Timișoara. The automotive

industry is the largest employer in Ghiroda, with companies such as Hella Electronics and Akwel.

The time series data identifies three instances of economic crisis (1997, 2008, 2021) and two phases of economic expansion (2003-2008 and 2011-2020). Intriguingly, during the 2011-2020 growth period, the labour force in Timișoara contracted, witnessing a reduction of 17,000 employees from its peak in 2008 to 2021. Concurrently, the number of employed individuals rose in the metropolitan areas, increasing by 38,000, and in other municipalities within the county, augmenting by 18,000, both over the span from 2008 to 2021.

Fig. 28
Distribution of employees by residence in the Timișoara Metropolitan Area, 2021

Data source: INS TEMPO FOM104D, 2021.

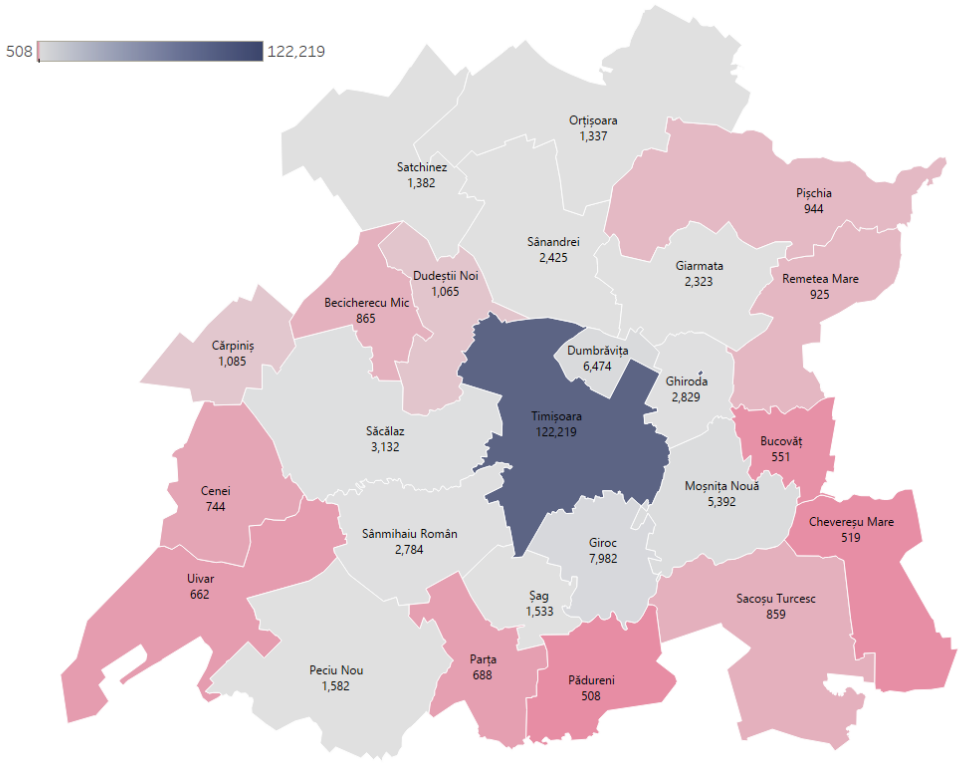


Fig. 29
Distribution of employees by residence in the Timișoara Metropolitan Area, 2021

Data source: INS TEMPO FOM104D, 2021.

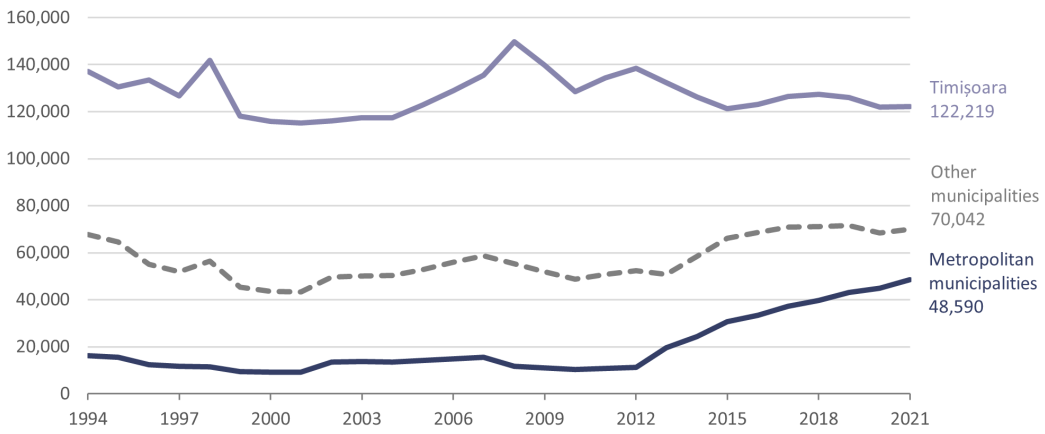
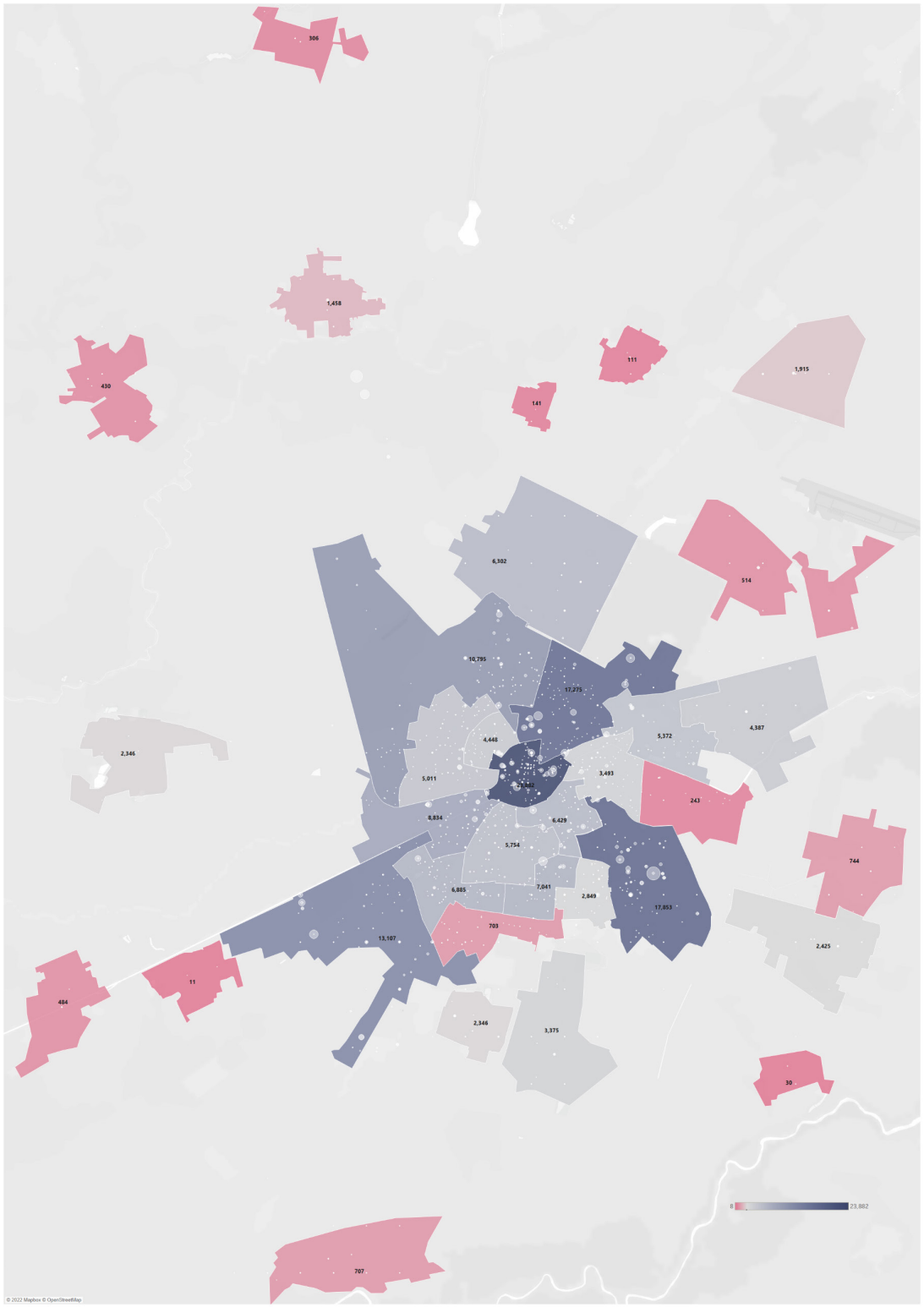


Fig. 30
Distribution of employees by company headquarters in Timișoara and the First Ring, 2021.

Data source: Timiș Territorial Labor Inspectorate, List of active employees by companies, 2022



Labour market structure

Time series analysis of the enrolled student population and school-age population has indicated correlations with the dynamics of employees in Timișoara and the metropolitan municipalities. Additionally, the analysis of school attractiveness, besides school prestige, has shown that parents' workplaces are essential in understanding families' preferences for certain schools. Moreover, we have observed that school performance is closely linked to residential geography and is also strongly stratified based on parents' education. The dynamics of the school system are influenced by economic factors, especially the labour market, which plays a significant role in shaping it.

Regarding the distribution of employees across sectors, the labour market structure in the Timișoara Metropolitan Area (TMA) exhibits several similarities with other urban centres of similar population size. The services sector (which includes commercial and social services) dominates in TMA, accounting for approximately 43% of total employed individuals. A distinctive feature is the significant share of the industrial sector in the area's economy, which accounts for approximately 31% of total employed individuals in the metropolitan area.

Public support sectors. Education and healthcare are structuring sub-sectors for the labour market in the Timișoara Metropolitan Area, representing the largest shares within the services sector (approximately 35% of service employees work in these sub-sectors). Combined, these sectors employ 31.7 thousand individuals across the entire metropolitan area, with approximately 80% concentrated in Timișoara municipality. The significant share of employees in these two sectors is expected, given the role and functions that the urban centre serves both at the county level (as county seat) and at the regional level..

Global service urbanisation. Approximately 28% of total employed individuals in the services sector work in fields connected to global flows of foreign direct investment, which outsource certain business processes (outsourced economy) to other countries besides the country of origin. These fields include Information and Communication Technology (ICT) and Business Process Outsourcing, Shared Service Centers, and Call Centers. These two sub-sectors employ over 25.2 thousand individuals, making them among the largest in the private sector, alongside the automotive industry. The outsourcing of certain commercial services has experienced significant growth in the last decade, primarily in large cities.

Industrial production at the metropolitan scale. Unlike other cities in Transylvania (such as Cluj-Napoca, Oradea, or Sibiu), the industrial sector is concentrated in the municipality of Timișoara, with two-thirds of industrial employees working in the urban centre. The metropolitan municipalities concentrate the remaining one-third of industrial workers in Greater Timișoara. The predominant sub-sectors are represented by the automotive industry and

machinery production, which together account for almost 50% of total employed individuals in the manufacturing industry.

Development of related services. The development of outsourcing in commercial and manufacturing services has also led to the development of related sub-sectors for both employees (e.g. cultural or recreational services) and capital (e.g. professional and technical services).

Residential development in the suburbs. As discussed in previous chapters, the population in metropolitan municipalities (especially those in the first ring) is increasing. Along with this shift in population towards municipalities around Timișoara, it is worth noting the significant share that certain sectors, such as real estate services or building construction, have in metropolitan municipalities.

Fig. 31
Labour force structure by categories of local economic activity, 2021.

Data source: Timiș Territorial Labor Inspectorate, 2021

Managers
Professionals
Workers
Service workers
Farmers

The specifics of the economy

The level of similarity between the local economy and the national economy can be evaluated using the Hachman Index, based on the structure of employees by economic activities. In this case, the index for Timiș County, the Timișoara Metropolitan Area, and Timișoara municipality differs considerably from the national level.

During the period analysed, the Hachman Index shows a downward trend in the degree of similarity of the three territorial economies to the national economy, with a few exceptions per year. The values for Timișoara municipality and Greater Timișoara show significant similarities, with minimal differences between them - in the period 2018-2020, they even coincide. In contrast, Timiș County has an index value of 0.16 for 2020, indicating a small degree of similarity to the national economy but different from Greater Timișoara and Timișoara (both with 0.11).

Therefore, all three spatial units show a low degree of similarity to the national economy for the year 2020. However, the Hachman Index values have increased compared to 2019 when they reached their lowest point during the analysed period (0.13 for Timiș County, 0.09 for Timișoara municipality and Greater Timișoara). We can identify the source of Greater Timișoara's low economic similarity to the rest of the national economy by proportionally decomposing the index. By analysing the sectors that have experienced growth in the local economy over the last decade, we can compare whether they have followed similar or opposite trajectories in the national economy.

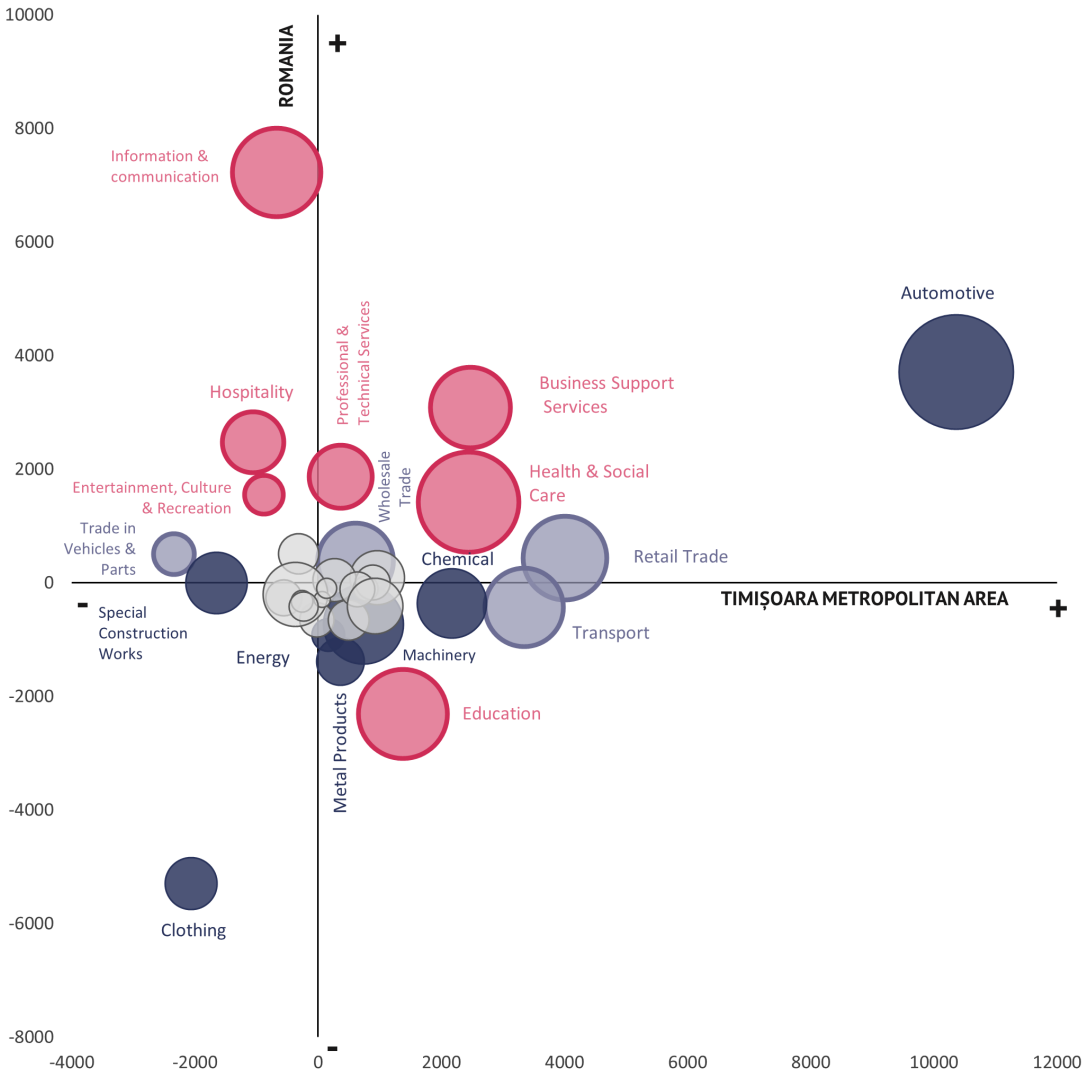
Greater Timișoara is distinguished from the national economy by its high share of employees in the industrial sector, which is a characteristic factor at the regional level in Transylvania and Banat. Additionally, specific industrial branches have experienced growth that is not mirrored at the national level. For the period between 2008 and 2020, there has been an expansion in sub sectors such as the automotive industry, the production of means of production, metal products, and the chemical industry. Although the automotive industry is experiencing growth throughout the country, its pace is more accelerated in Timișoara and its metropolitan areas. On the other hand, there are branches that have experienced contractions both at the national level and in Greater Timișoara, such as the textile industry, which is mainly located in the municipalities surrounding the municipality.

Business support and information & communications services are specific to the new wave of outsourcing certain processes of global firms. Although experiencing growth in Romania over the last decade, this trend is specific to certain cities that function as regional centres, such as Iași, Timișoara, Cluj-Napoca, and Bucharest. However, growth rates may differ between these cities. Although Greater Timișoara is experiencing an openness to these new sectors, it is worth noting that only business support services have a growth rate higher than the national average, while information & communications

services do not have an increase as pronounced as in Cluj-Napoca, for example. The growth of the business support services sub-sector and, to a certain extent, the professional and technical services sub-sector may be linked to recent industrial development.

The transport sub sector in Greater Timișoara is experiencing growth, which contrasts with the stagnation observed at the national level. The expansion of ride-sharing, courier, and food delivery platforms may be contributing to this growth. Moreover, the region's geographic location near the western border of the country and its industrial activities have resulted in a high demand for employees in this field.

Fig. 32
Economic sectors with the most significant growth in the number of employees in Greater Timișoara, compared to the national level, between 2008 and 2020.



Professional and occupational categories in urban poles

The composition of the workforce is a crucial indicator of a city's level of globalisation. A high concentration of leadership and management positions suggests that the urban centre plays a significant economic and political role in command and control. Global cities tend to have a significant number of such positions, which are responsible for managing transnational capital networks.

A high concentration of specialist positions indicates that the urban centre offers a significant number of service activities to global firms, such as localization and relocation of movable capital, or outsourcing of business activities. The three most outsourced global activities are information technology and communications, business support services, and engineering, research, and development.

Bucharest is a global city in all contemporary rankings, with a regional influence in Eastern and Central Europe.

More than a quarter of all managers in Romania live in Bucharest, as well as a fifth of all specialists. It is true that Bucharest is the largest city in Romania, concentrating 9.3% of the country's population, that is, around 2 million people (to which is added the population of Ilfov of 400 thousand). However, the proportion of management positions and specialists is very high, 3 times higher relative to the size of the capital.

Bucharest accounts for most of Romania's aggregated revenues. However, over the past decade, its share has decreased from 65% in 2008 to 44% in 2018, with other cities such as Cluj-Napoca, Iasi, and Timișoara experiencing a growth in their share of aggregated revenues.

Timișoara, Cluj-Napoca, and Iasi play a significant role in regional polarisation and serve as command-and-control centres for various regional urban areas. These cities have a high percentage of their population employed in the service sector, with over 50% of the total workforce. Other cities, such as Constanța, Brașov, Craiova, Oradea, and Ploiești, also have regional significance, even if they do not serve as command-and-control centres. These cities have a workforce employed in the service sector ranging from 40% to 50% of the total employees in the locality.

Cities such as Timișoara, Cluj-Napoca, and Iași have a smaller population, with around 340 thousand inhabitants, which is around 1.5-1.6% of the Romanian population. Despite their smaller size, these cities participate in global capital flows, which affects their social composition. In all three cities, at least one in three employees holds a specialist position. In contrast, in other growth pole

cities such as Constanța, Craiova, Brașov, Oradea, and Ploiești, only one in five employees hold specialist positions.

However, a noticeable relative disproportion of managers and specialists in relation to the population is apparent. In this case, Timișoara concentrates approximately 3% of the total number of managers and approximately 4% of the total number of specialists in the country, which represents at least double the proportion expected based on the city's size relative to the national population.

In addition to these demographic groups, there exists a layer of pupils, a valuable resource for recruitment pools for specialist and managerial positions. In Timișoara, there are approximately 43.4 thousand pupils, constituting roughly 14% of the urban population. In contrast, Cluj-Napoca boasts around 71.7 thousand pupils in the 2020-2021 academic year. In Bucharest, the proportion of pupils is not as significant, accounting for 5% of the population, owing to the sheer size of the capital's population.

Fig. 33
Occupational categories in relation to the total number of employees in the same category in Romania, in each growth pole, 2020

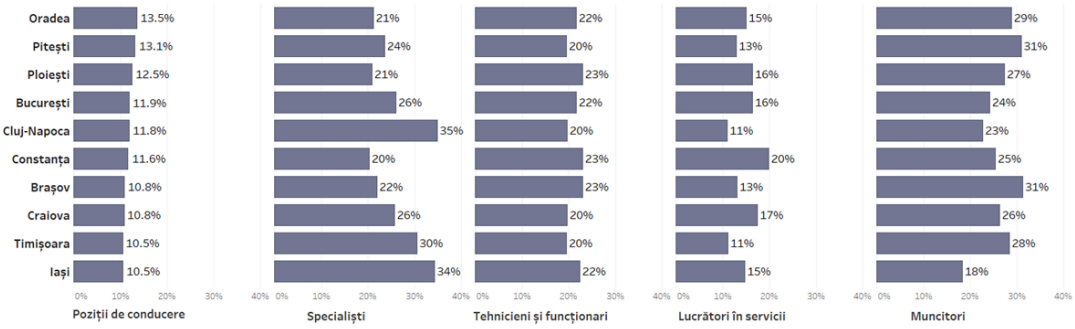
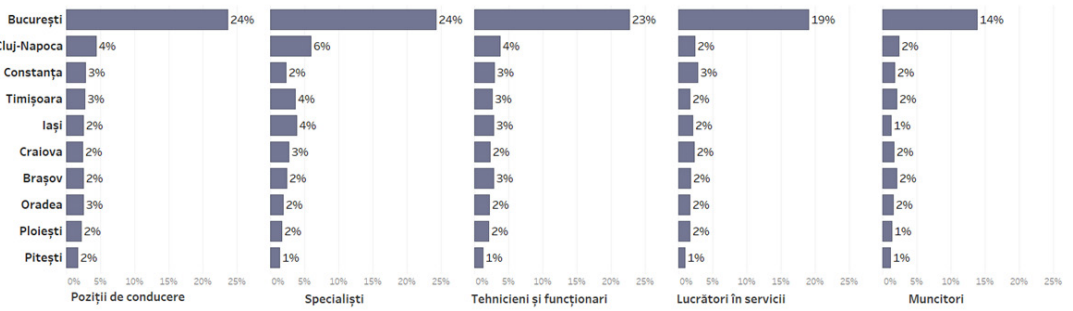


Fig. 34
Occupational categories in relation to the total number of employees in each growth pole, 2020

Technical data: Starting from the distribution of employees in 2020 by the activities of the national economy in the balance sheets of companies and using the distribution of occupations by activity in each growth pole at the 2011 census, we calculated the distribution by occupational categories.



Aggregated turnover by economic activity

Agriculture. Timiș County has a high potential for agriculture. However, the turnover obtained by companies in Timișoara from agriculture is extremely low, representing only 1.6% of the total turnover recorded in the city in 2020. This is not surprising, as lands on the outskirts of large cities are primarily intended for other types of activities.

Industry. The industrial sector holds a significant share of Timișoara's economy, representing 43% of the turnover in 2020 and ranking as the second largest field after services. The manufacturing industry subsector dominates, positioning Timișoara as an economic profile comparable to Iași, Brasov, Oradea, and Ploiești. Timișoara, along with Craiova, exhibits the lowest values for the construction sector. This finding, in conjunction with previous analyses, supports the hypothesis that Greater Timișoara is primarily developing in metropolitan areas, to the detriment of the city itself.

Services. The service sector can be divided into several sub-categories based on INS categories, including trade, transport and storage, commercial services (hotels and restaurants, information and communications, financial intermediation and insurance, real estate transactions, professional activities, administrative services), and social services (public administration and defence, education, health and social assistance, entertainment, recreational and cultural activities).

In Timișoara, the majority of turnover from services comes from trade activities (about 43%). Despite being a city dominated by the manufacturing industry, Timișoara has a large percentage of its service sector coming from trade. Key sectors of commercial services (12%) are relatively small compared to cities where these sectors are economic engines (20% in Bucharest, Iași, and Cluj-Napoca). However, Timișoara has developed its commercial services anchored in information and communication services (approximately 38% in 2020 from commercial services). The proportion of these sectors is lower than in Cluj-Napoca, where two-thirds of the turnover in commercial services is made in ICT, but similar to that of Bucharest and Iași. Except for Craiova, which is intensive in medium high-tech activities, all other growth poles, including Timișoara, fall under the less knowledge-intensive services group.

Fig. 35
Turnover on large economic sectors in the growth poles, 2020

Data source: Economic Operators' balance sheets, 2008–2020, Ministry of Public Finance, data.gov.ro.

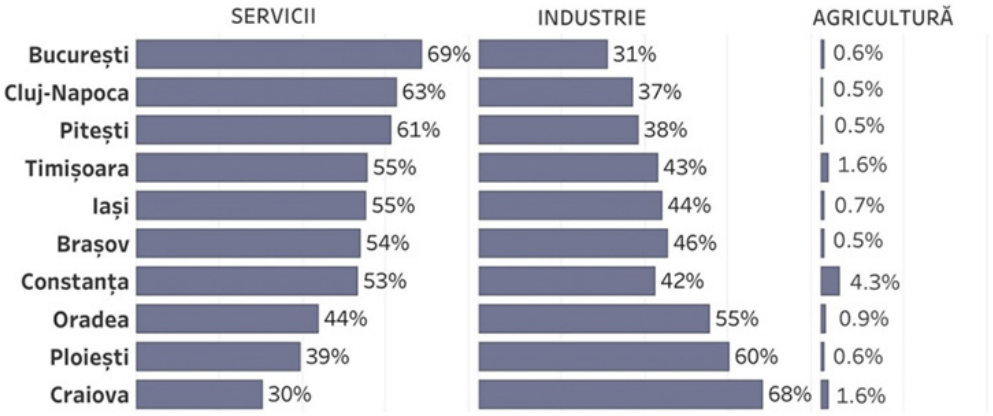


Fig. 36
Turnover by economic sub-sectors in growth poles, 2020

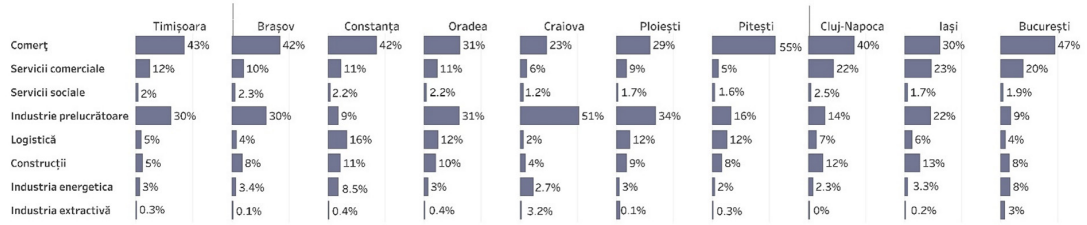


Fig. 37
Turnover in key sub-sectors of services in the total sector growth pole services sector, 2020

Technical data: (a) sub-sectors strongly connected to global outsourcing flows and (b) sub-sectors providing services to capital or employees in these sectors have been selected.

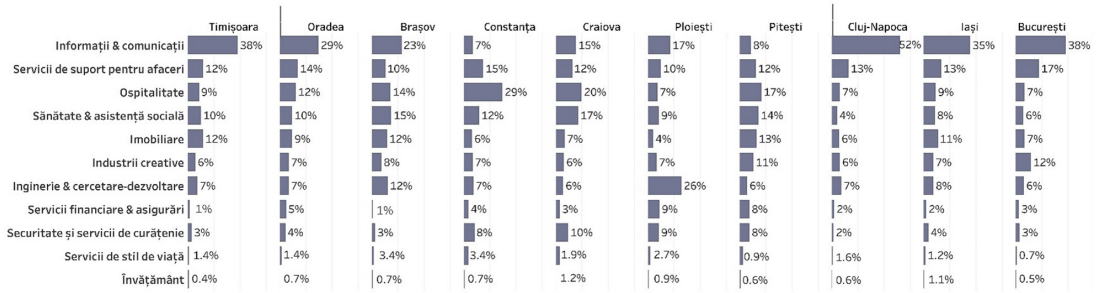


Fig. 38
Turnover by sector, 2008–2021, mil. Ron, Timiș

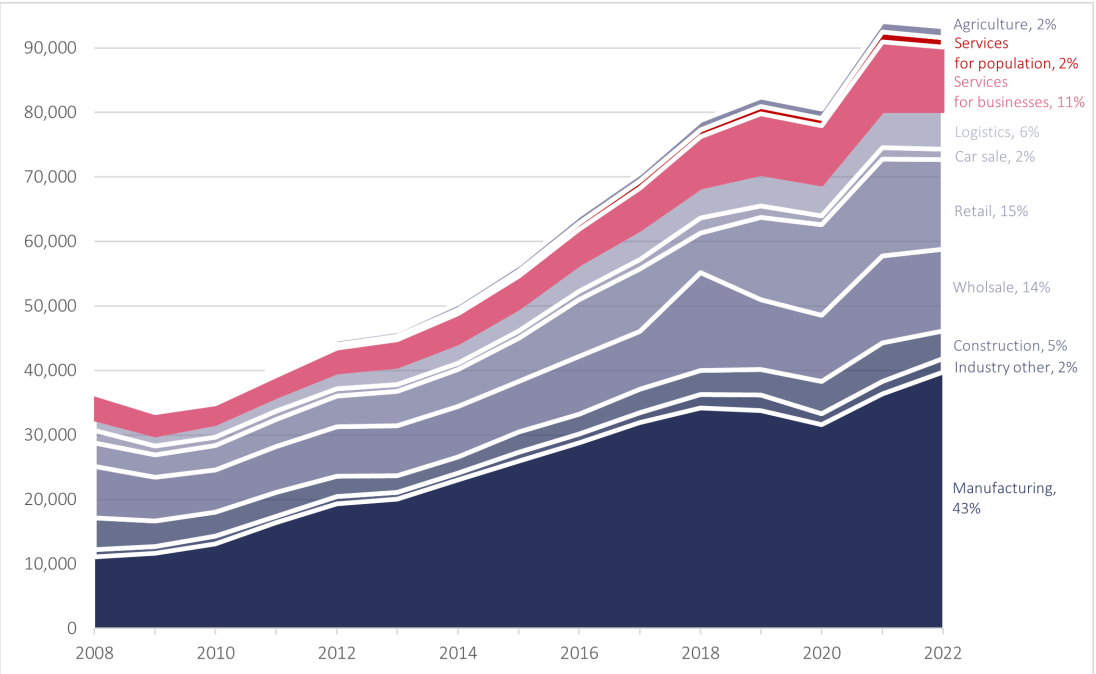
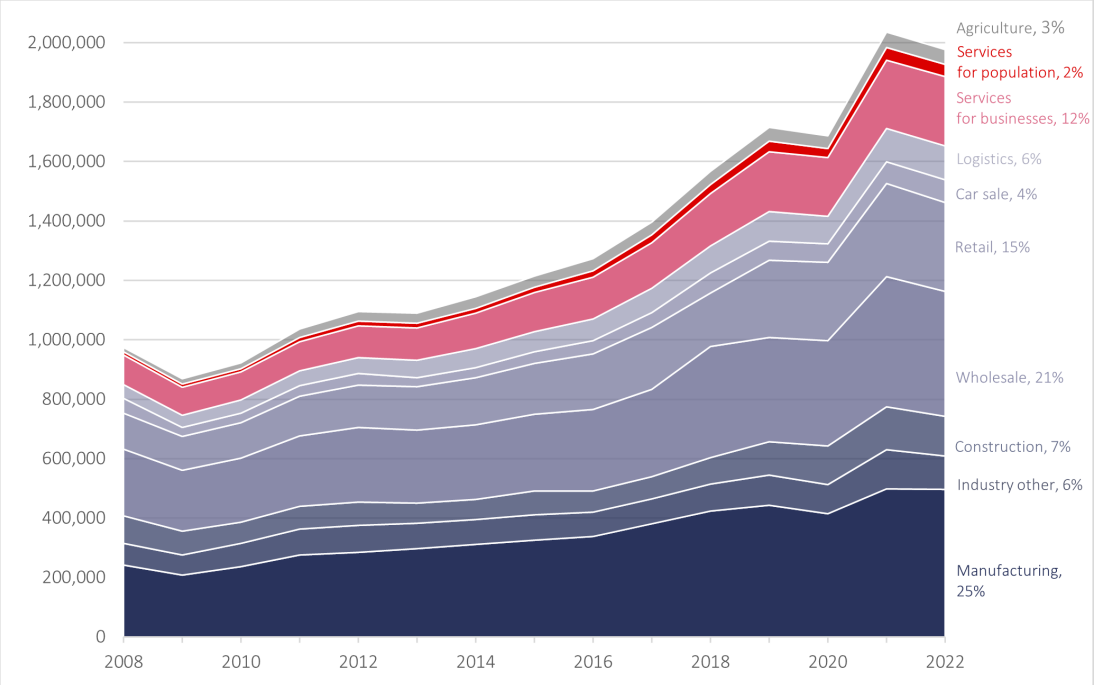


Fig. 39
Turnover by sector, 2008–2021, mil. Ron, Romania



Tab. 12
Turnover by sector, 2008–2021, mil. Ron, Romania

Above-Average Differences:
p < 0.001
p < 0.050

Below-Average Differences:
p < 0.001
p < 0.050

	2008	2012	2019	2020	2022
Manufacturing	30%	43%	41%	39%	43%
Industry other	3%	3%	3%	2%	2%
Construction	13%	7%	5%	6%	5%
Wholesale	21%	17%	13%	13%	14%
Retail	10%	11%	15%	17%	15%
Car sales	5%	2%	2%	2%	2%
Logistics	5%	6%	6%	6%	6%
Services for population	1%	1%	1%	1%	2%
Services for businesses	10%	8%	11%	11%	11%
Agricultura	1%	2%	2%	2%	2%
Total	100%	100%	100%	100%	100%

Labour migration and commuting

Internal Migration Patterns and Urban Development in Timișoara and its Surrounding Metro Area

This chapter provides an overview of internal migration patterns in Timișoara and its surrounding metro area using census data and employer-provided information. The population is evenly split between natives and internal immigrants, with one-third coming from distant parts of Romania. Migration patterns have changed over time, with socialist-era migrants coming from longer distances, while from 1990 to 2001, migration from neighbouring municipalities decreased, and migration from adjacent counties increased. From 2002 to 2011, long-distance migration decreased, and the urban and educated immigrant population grew. Economic growth led to shifts in the labour force from Timișoara to surrounding municipalities. Demographic changes, including population decline in Timișoara and growth in the metro area, correlate with labour market fluctuations. The research also highlights the residence of Timișoara's employees in a few major companies, with a quarter living outside Timiș County. The study underlines the significance of understanding these migration patterns for effective urban planning and sustainable development.

Internal migration to Timișoara

The population of Timișoara is evenly divided between natives and internal immigrants (48%). Among the immigrant population, one-fourth originates from a municipality within the Timiș region. Another fourth comes from adjacent counties, while 19% originate from the second ring of counties. Notably, a significant proportion of immigrants, accounting for one in three, originate from more distant parts of Romania. The migration patterns in relation to distance have changed significantly across different time periods.

During the socialist era, most immigrants originated from longer distances, accounting for 40% of the total, while a second group came from nearby municipalities, comprising 28% of the immigrant population.

During the period between 1990 and 2001, there was a noticeable shift in the composition of immigrants to Timișoara. Most migrants started to come from the first and second adjacent ring of counties, while the number of migrants from neighbouring municipalities decreased. However, it is important to highlight that the largest group of immigrants still originated from longer distances, accounting for 36% of the total. Notably, there was a significant wave of migration towards Timișoara in 1998 and 2001, which coincided with the privatisation of former socialist factories that began in 1997 and Romania's near-avoidance of default during the 1999 crisis. This period witnessed an influx of foreign direct investments into the city as the factories were either acquired by multinational corporations or returned to former owners who had emigrated abroad during socialism.

From 2002 to 2011, there was another shift in the distribution of migrants. Most migrants during this period came from the first adjacent counties (35%) and the second adjacent counties (24%), while long-distance migration significantly decreased. As Romania's economy entered a new cycle of economic growth after 2002, internal migration regained momentum, with Timișoara becoming an increasingly attractive destination city.

A notable trend, especially from 2002 onwards, is the increasing number of urban and educated immigrants in Timișoara. This trend is particularly pronounced among migrants coming from neighbouring regions, who tend to be well-educated urban individuals with at least a high school education. As the influx of rural workers diminishes, the composition of long-distance migrants has shifted towards young urban populations who enrol in university programs in Timișoara. After completing their studies, this population chooses to settle in the city, drawn by the expanding labour markets that provide employment opportunities for graduates.

Tab. 13
Immigrants to Timișoara by county, and time period, between 1950 and 2011, 2011 Census.

Data source: Census 2011. Significant differences between time periods, □2 (6)= 9045, p < 0.001; C= 0.235.

Period	Timiș County	1st Adjacent Ring of Counties	2nd Adjacent Ring of Counties	All the rest of Counties	Total
1950-1989	27.71%	16.43%	15.84%	40.01%	100% (69.616)
1990-2001	22.74%	23.10%	18.17%	35.99%	100% (35.561)
2002-2011	21.03%	34.45%	23.91%	20.61%	100% (49.869)
All periods	**24.42%**	**23.76%**	**18.97%**	**32.85%**	100%(155.046)

Fig. 40
Immigrants to Timișoara from other municipalities and regions between 1990 and 2011, 2011 Census.

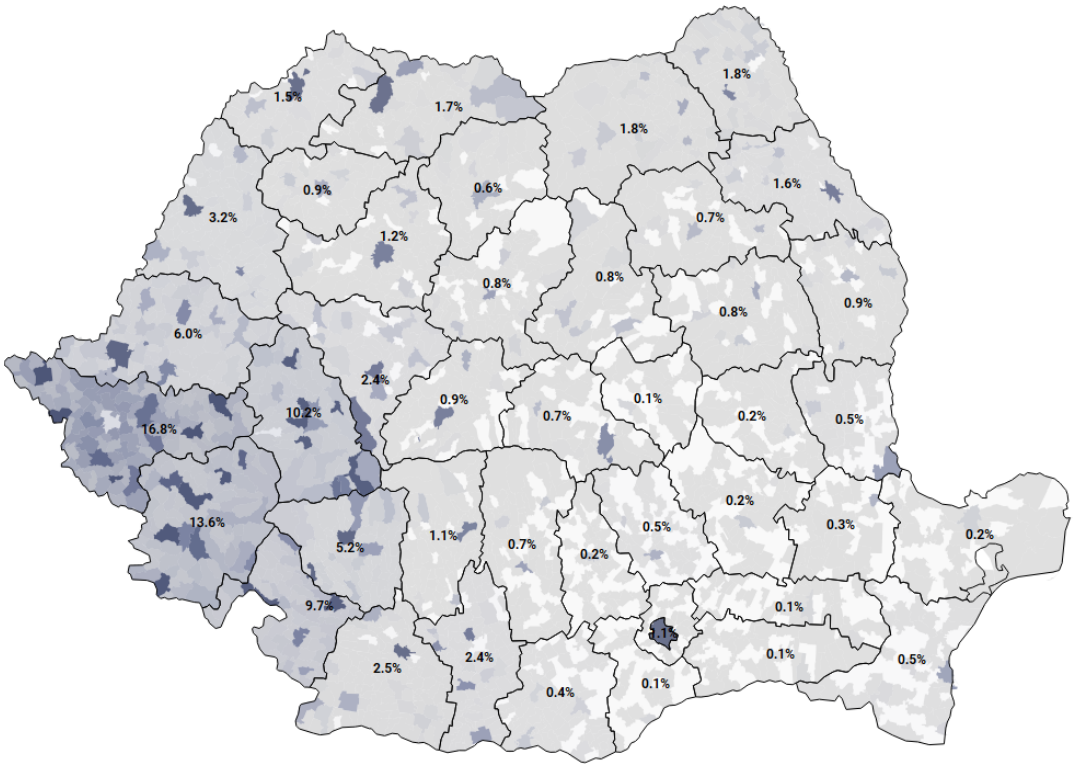
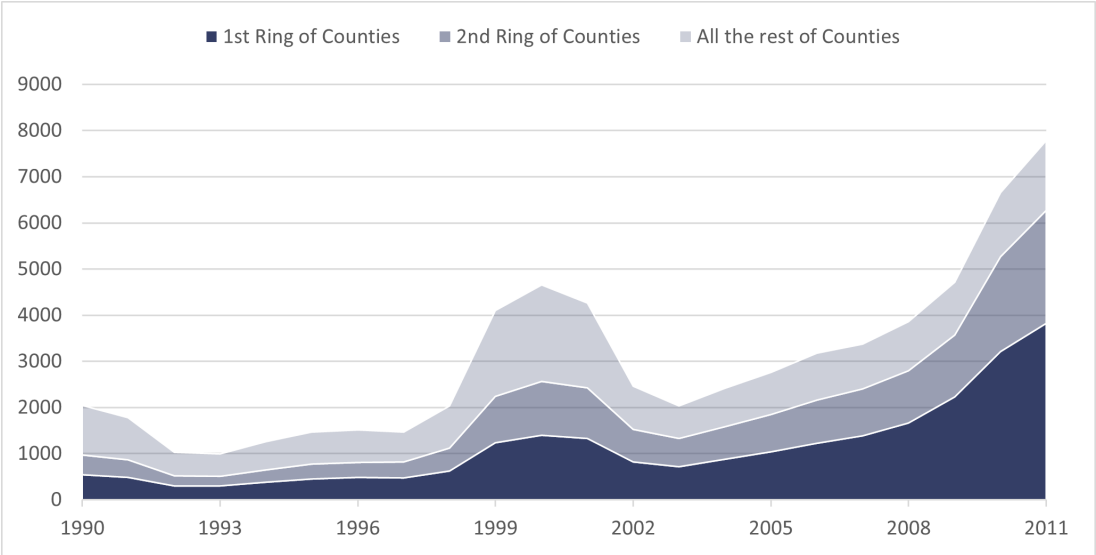


Fig. 41
Immigration to Timișoara from other municipalities between 1990 and 2011, 2011 Census. The data is represented as moving averages over a three-year window.



Internal migration to metro area

The population of the metropolitan municipalities of Greater Timișoara is evenly divided between native residents and internal migrants (the last category comprising 46% of the total population). Notably, approximately 42% of the immigrant population originates from the city of Timișoara itself, while an additional 14% comes from other municipalities within Timiș County. The migration patterns in relation to distance have exhibited significant changes across different time periods.

Between 1950 and 1989, internal immigrants to the metro municipalities predominantly originated from long distances, particularly from North Moldova. These migrants primarily engaged in rural-to-rural migration and were predominantly from rural areas. On average, this population had elementary education and were employed in the socialist agriculture sector. It is worth noting that immigrants from Timișoara were a minority during the socialist era.

During the period from 1990 to 2001, the distribution of immigrants to the metro municipalities underwent significant changes. Immigrants were almost evenly distributed between those originating from Timișoara (44%) and those coming from longer distances (30%). The total volume of migration during this ten-year period was 11 thousand people, in contrast to the 15 thousand people observed during the preceding 40-year period from 1950 to 1989. In the first decade following the socialist era, the population of unemployed workers from the former socialist factories, primarily with a high school education, left Timișoara for rural areas.

From 2002 to 2011, the metro municipalities experienced an influx of 21 thousand people, which constituted the most significant wave of migration during the observed periods. Most of this influx originated from Timișoara (64%). The distribution of the remaining migrants was as follows: 11% from Timiș County (excluding Timișoara), 11% from the first and second adjacent ring of counties, and 13% from the rest of the counties. It is notable that a significant proportion of the suburban population possessed university degrees, indicating the emergence of a new suburbanite typology.

During the first postsocialist growth cycle from 2003 to 2008, the suburban area, which was previously an agricultural hinterland supporting the local economy and providing food for urban residents, experienced a significant transformation. It became an attractive destination for university graduates seeking affordable apartments and accessible single-family houses. While the metropolitan area continued to serve as a significant source of agricultural workers transitioning into blue-collar roles within the thriving economy, it also evolved into a housing resource for the emerging middle class.

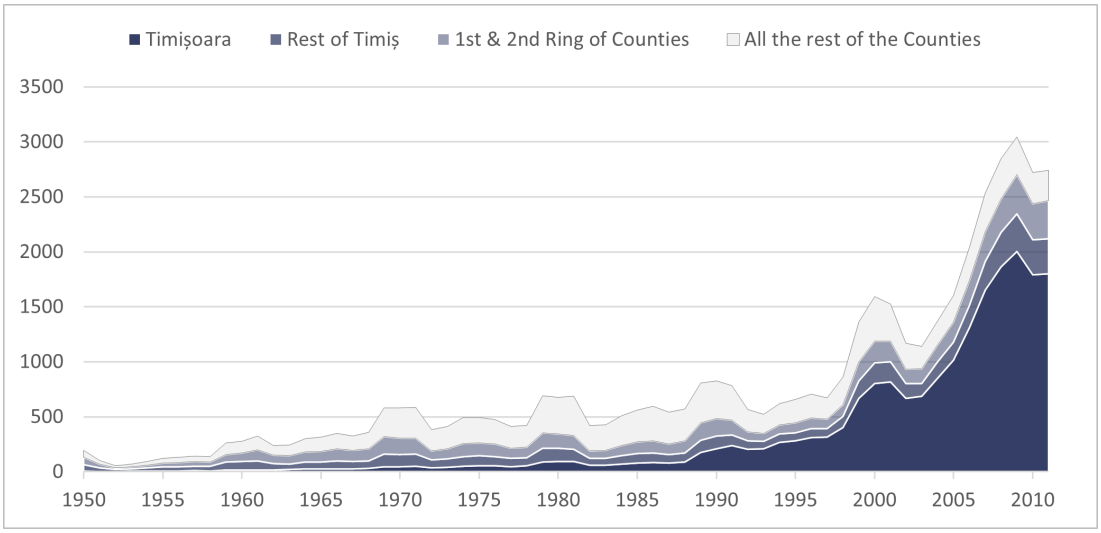
Tab. 14
Immigrants to Metro Municipalities by place of origin, between 1950 and 2011.

Data source: Census 2011. Significant differences between time periods, □2 (6)= 9045, p < 0.001; C= 0.433..

Period	Timișoara	Timiș, non-Timișoara	1st & 2nd Adjacent Ring of Counties	All the rest of Counties	Total
1950-1989	11%	19%	24%	47%	100% (15,123)
1990-2001	44%	12%	14%	30%	100% (11,015)
2002-2011	64%	11%	11%	13%	100% (20,944)
All periods	**42%**	**14%**	**16%**	**28%**	**100% (47,082)**

Fig. 42
Immigrants to metro municipalities of Timișoara, from other municipalities and counties, 2011 Census.

Fig. 43
Immigrants to metro municipalities of Timișoara, from Timișoara and by county type, between 1950-2011, by year, at the 2011 Census. The data is represented as moving averages over a three-year window.



Urbanisation morphology

What sets Timișoara and its metropolitan area apart is the relatively uniform distribution of employees across its territorial profile, which is not the case for other regions such as Cluj County, where the geography does not allow for such homogeneity. The history of territorial planning in the Habsburg period serves as a crucial asset for the Banat plain, enabling the utilisation of the entire labour resource within the county's jurisdiction. The Timișoara Metropolitan Area (Greater Timișoara) stands as the primary hub of labour resource attraction; however, the spatial distribution of such resources underwent significant changes during the period spanning from 2012 to 2022.

Since 1990, the Timișoara Metropolitan Area has undergone two distinct periods of sustained economic growth: 2003-2008 and 2011-2021. During the first period, most of the workforce was concentrated in Timișoara itself. However, in the subsequent period (2011-2021), there was a notable decline of 17,000 employees in Timișoara, while the metropolitan municipalities experienced an increase of 38,000 employees, and other municipalities within the county saw an increase of 18,000 employees. This observation is significant as it reflects a trend of labour suburbanization accompanying the 2011-2021 cycle of economic growth. Moreover, these dynamics suggest that this new phase of economic growth is characterised by the suburbanization of logistics activities and the urbanisation of manufacturing and business-service capital.

Population dynamics in Timișoara exhibit a strong correlation with the fluctuations in the local labour market. From 2008 to 2022, Timișoara experienced a population decline of approximately 20,000 residents, while the surrounding metropolitan municipalities witnessed a notable increase of around 62,000 inhabitants. This equates to a relative decrease of about 6% in Timișoara's population, contrasted by a 9% increase in the metropolitan area, primarily concentrated in the municipalities of the first ring. The observed trend cannot be solely attributed to natural population growth but is largely influenced by migration patterns, particularly the suburbanization of the population and the phenomenon of commuting to Timișoara.

These migration patterns have implications for the demographic composition of a region, particularly in terms of the proportion of young individuals. The initial phase of economic growth, concentrated in Timișoara from 2006 to 2008, coincided with a rise in the number of newborns. These individuals subsequently pursued their education in Timișoara over a span of seven years, from 2010 to 2015. Notably, there exists a correlation between the two growth curves with a time lag of seven years.

In the second phase of economic growth, spanning from 2011 to 2021, the metropolitan municipalities, particularly those in the first ring, experienced an upsurge in economic activity. However, the demographic effects of this growth only became apparent in these municipalities starting in 2014.

It is important to note that this phenomenon has occurred in the absence of a dedicated program for the construction of collective housing within the city limits of Timișoara. These observations provide insights into the urbanisation morphology of the region. The communes of Dumbrăvița in Northern Timișoara, and the municipalities of Giroc, Chișoda, and Utvin in Southern Timișoara, serve as natural urban extensions of the city. This expansion is a result of the economic growth experienced by Timișoara, and it cannot be assimilated to the classical suburbanization process.

Fig. 44
Average years of schooling among internal migrants to Timișoara, by year, as of the 2011 Census.

Data source: Census 2011.

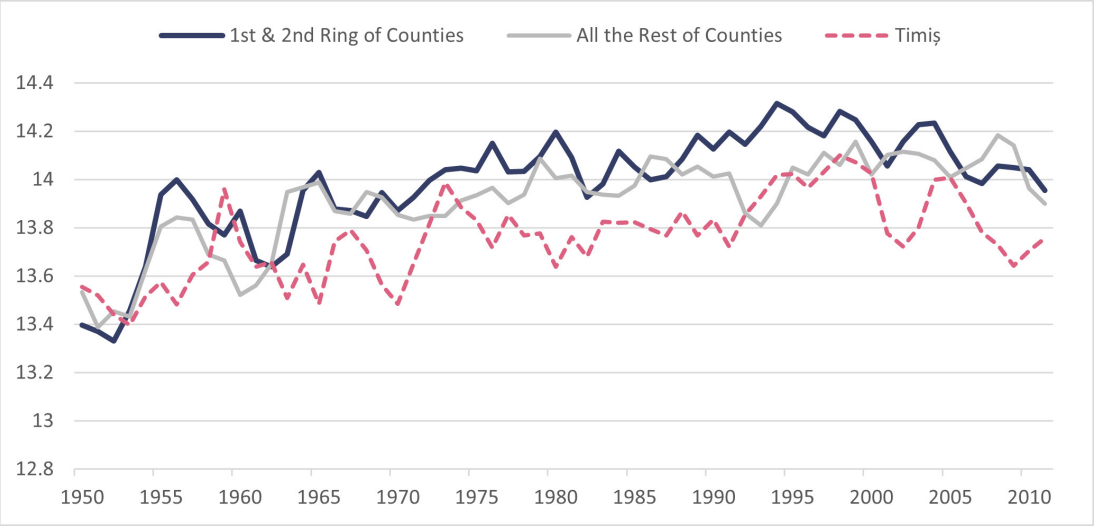
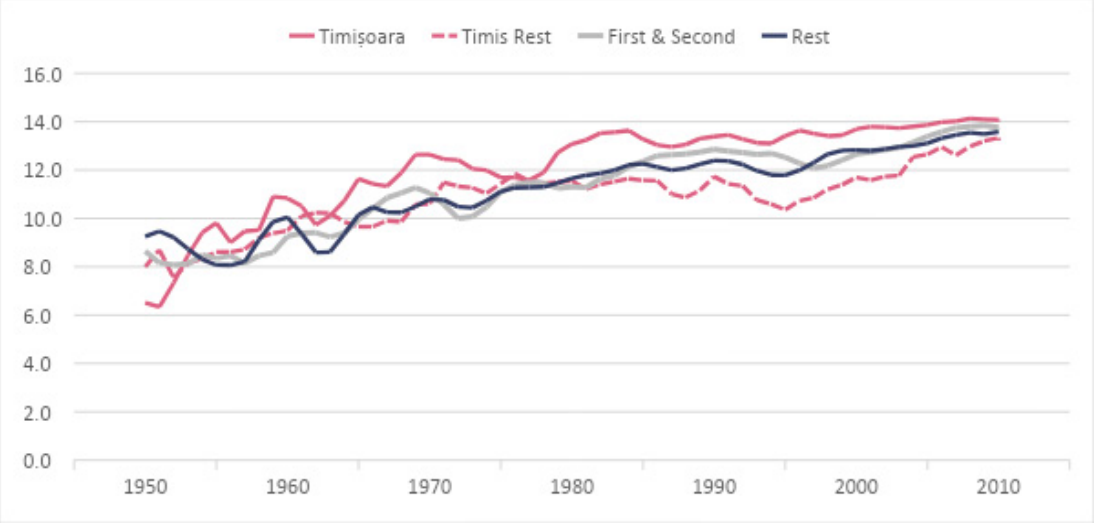


Fig. 45
Average years of schooling among internal migrants to metro municipalities of Timișoara, by year, as of the 2011 Census.

Data source: Census 2011.



The Residence of Timișoara's Employees

We obtained anonymous data about the employees from five major companies in Timișoara: Dräxlmaier, Continental and Flex (industrial sector, electronic components manufacturing), Azur (industrial sector, resins, coatings and paints) and Nokia (in IT&C). This data includes information about their employees' place of residence, education, age, and type of position held.

It is important to differentiate between the legal residence (as indicated on their identity cards) and the usual residence (the address used in the past 12 months). This distinction is crucial because some employees, although residing in Timișoara and considering it their usual residence, have not changed their legal residence to match their new address.

This discrepancy between legal and usual residence is common among immigrants, but for commuters, the two residences are usually the same. It should be noted that there is a mismatch between legal and usual residence for white-collar employees who are more often immigrants, while for blue-collar employees, who are more often commuters, the two typically coincide.

Among the recorded data, Flex provided both legal and usual residence information, allowing us to observe an 85% match for white-collar employees and a 98% match for blue-collar employees.

A noteworthy point is that a quarter (25%) of employees reside in municipalities outside of Timiș county. This observation highlights a strong statistical association between higher education and having a legal residence outside of Timiș, as individuals who immigrate from greater distances tend to have more years of education on average and typically maintain their original legal residence.

The likelihood of changing one's legal residence is higher for immigrants who become property owners, for tax purposes, while it is lower for those who are tenants. Furthermore, among university graduates, men are twice as likely as women to have a legal residence outside of Timiș while working in Timiș.

Additionally, university graduates with legal residence outside of Timiș are younger, with an average age of 29, compared to those living in the Timișoara Metro Area, who have an average age of 36. These insights offer valuable context for interpreting the data at the company level.

The employee composition in different companies provides valuable insights. In Azur, 85% of employees are blue-collar workers, while in Flex this is 70%.

However, in Dräxlmaier, blue-collar workers account for 33% of the workforce, while in Continental Automotive Romania, the figure is 8% (i.e. excluding the Continental Automotive Products factory, which has a different workforce composition), and in Nokia, it reaches 9%. This workforce distribution carries significant implications.

It is notable that Dräxlmaier, Continental, and Flex operate in the industrial sector, specifically in electric and electronic manufacturing. Surprisingly, Continental Automotive Romania shares a similar workforce profile with Nokia, an IT&C sector company.

Tab. 15
Distribution by education level of the employees

Data source: as provided by each company.

Legal residence	Up to 10 grades	High school	University	Total
Timișoara	3%	31%	66%	100% (5,146)
Metropolitan Ring 1	2%	21%	77%	100% (1,553)
Metropolitan Ring 2	9%	47%	44%	100% (300)
Municipality from Timiș	11%	49%	39%	100% (9,68)
Municipalities form other counties	2%	40%	58%	100% (2,694)
Total	3%	34%	63%	100% (10,661)

Tab. 16
Distribution of employees based on legal residence (based on their identity card).

Data source: as provided by each company.

Legal residence	Continental	Draexlmaier	Flextronics	Azur	Nokia	Total
Timișoara	42%	46%	48%	53%	62%	48%
Metropolitan Ring 1	19%	14%	12%	15%	9%	15%
Metropolitan Ring 2	1%	5%	5%	2%	1%	3%
Municipalities from Timiș	5%	19%	16%	6%	4%	9%
Municipalities form other counties	32%	17%	18%	25%	24%	25%
Total	**100% (4,597)**	**100% (455)**	**100% (3,373)**	**100% (179)**	**100% (2,057)**	**100% (10,661)**

This situation highlights a broader concern regarding the classification of the labour force in Timișoara. Many divisions or departments of companies classified as industrial also house R&D, engineering, and IT&C services. Within the manufacturing sector in Timișoara, there is a notable proportion of college-educated individuals who provide services to businesses within the extensive supply chains of the automotive industry. Various manufacturing companies effectively operate in the realm of service businesses.

The 2011 census reveals that Timișoara had a significant proportion of its college-educated employees (18%) working in manufacturing, whereas Iași and Cluj had a lower percentage (10% and 9% respectively).

In contrast, the structure of the service sector differs across major cities in Romania. The proportion of college-educated individuals working in business services in Timișoara is like that in Iași, but considerably smaller compared to Cluj-Napoca and Bucharest. Furthermore, services provided to the general population (such as education, health, public administration, culture, and sports) are relatively smaller in Bucharest, despite it being the headquarters of national public institutions. This is due to the significant presence of a large private sector in business services in the capital of Romania.

The employee maps serve as a representation of both the broader area from which the labour pool in Timișoara is sourced and a narrower depiction of the daily commuting patterns.

The map of employment in the five companies reveals that the trends observed during the period of 2002-2011 have further intensified during the decade of 2011-2022. Specifically, the recruitment of college-educated labour predominantly occurs from urban areas located in the neighbouring counties of Timiș. Additionally, the labour pool within Timiș has notably contracted towards the county boundaries, and there has been a significant decline in long-distance commuting among blue-collar workers. The previous socialist-era practice of recruiting farmers and workers from across the entire country, particularly from Transylvania and North Moldova, has vanished. The recruitment of the labour pool has become more regionally focused.

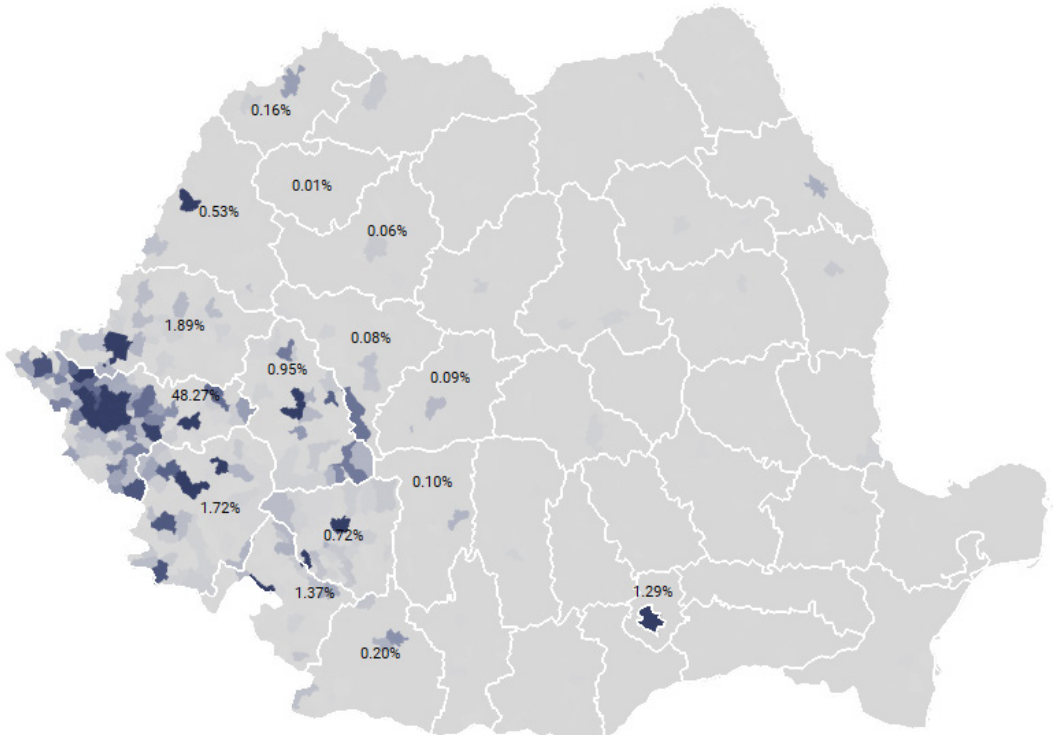
The employee residence map for Flex in 2023 reveals that half of its employees (48.1%) reside in Timișoara, while the other half commute. Among the commuting employees, 18% live in one of the metro municipalities, 17% reside in another municipality of Timiș, outside the metropolitan area, and another 18% commute from outside the county.

The distribution of blue-collar workers in Dräxlmaier and Azur is remarkably similar. Approximately 48.8% of employees come from Timișoara, 17% from the metro municipalities, 21% from other municipalities within Timiș, and 13% from other counties. The main distinction between Flex and Dräxlmaier/Azur lies in the percentage of employees commuting from outside of Timiș, which is higher for Flex. The white-collar commuters for Flex are primarily from Moșnița and Giroc if specialist, and from Dumbrăvița if they have a managerial position. The proportion of commuters was smaller for white collars (36%) compared to blue-collars (52%), however it was much more concentrated in the metro area in the first ring of municipalities.

An important observation is that Timișoara has a significant working-class population within its administrative city limits, constituting half of the blue-collar workers. However, the other half of the working class employed in Timișoara commutes from outside the city.

Fig. 46
Legal residence of employees working in Timișoara at Continental, Dräxlmaier, Flex, Azur, Nokia, 2023

Data source: as provided by each company.



Tab. 17
College educated employees by sector across the major four cities in Romania.

Data source: Census 2011. Significant differences between time periods, X^2 (6)= 27469, p < 0.001; C= 0.212.

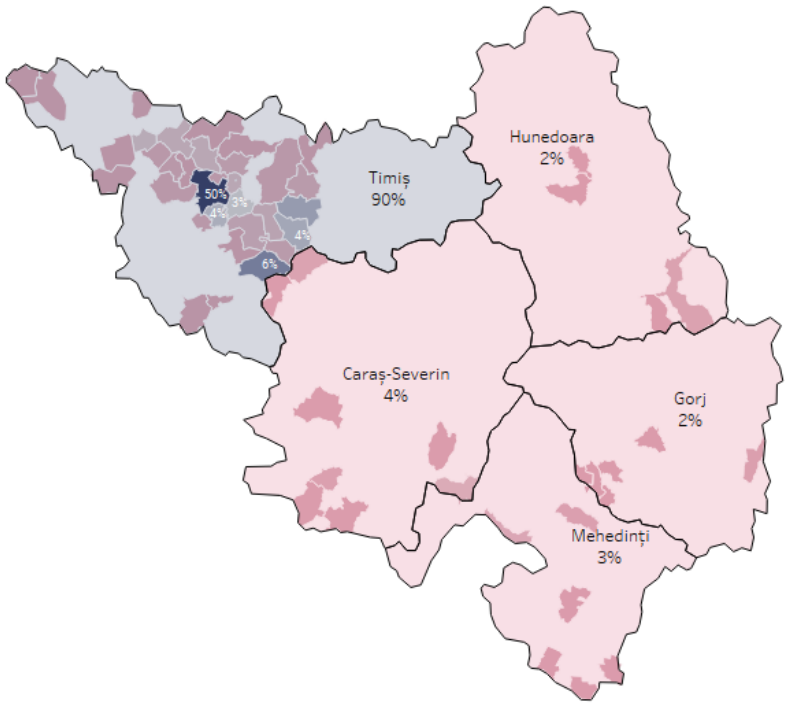
Sector	Timișoara	Iași	Cluj-Napoca	București	Romania
Services for population	33%	40%	35%	31%	39%
Services for businesses	23%	23%	29%	36%	22%
Manufacturing	18%	10%	9%	6%	11%
Rest of Industry	7%	8%	8%	7%	8%
Trade & Logistics	18%	19%	19%	19%	19%
Agriculture	1%	1%	1%	0%	2%
Total	100% 66,030	100% 57,923	100% 68,960	100% 418,597	100% 1,990,636

Fig. 47
Usual residence of employees working at Flex, 2023

Data source: as provided by Flex.

Fig. 48
Legal residence of blue-collar employees working at Dräxlmaier and Azur, 2023

Data source: as provided by Dräxlmaier and Azur.



Ownership networks, 2022

Foreign Direct Investment Spillover Effects

The chapter investigates the impact of Foreign Direct Investment (FDI) on the economic structure of Timișoara and Timiș County. Analysing 2,829 interconnected companies, we explore the integration of FDI within the region's economic framework and its effects on domestic firms. The potential spillover effects of FDI on domestic companies are examined through an analysis of tie formation patterns between FDI and domestic firms across various economic sectors and technological levels. Logistic regression analysis identifies key factors influencing FDI presence, while the Exponential Random Graph Model (ERGM) sheds light on the dynamics of tie formation and its correlation with network structure and ownership ties. The study's findings suggest limited horizontal spillovers, as FDI companies dominate specific tradable sectors, while domestic capital prevails in non-tradable sectors. Notably, FDI companies are more inclined to create new companies within their sector, enabling technological upgrades of Romania's export-led economy. Furthermore, since 2019, domestic companies, particularly from the financial sector, have been investing in advanced tech-startups, leveraging their local knowledge, and contributing to the growth of valuable SMEs.

Regional diversification and FDI-companies

Regional diversification has attracted significant attention as it involves new activities merging with local ones in a branching process that allows for economic growth and complexification (Boschma, Miguelez, Moreno, & Ocampo-Corrales, 2023).

Multinational corporations (MNCs), given their substantial investments in R&D (Papanastassiou, Pearce, & Zanfei, 2020), have proven effective in reducing the costs of bridging the gap between existing and required capabilities for developing innovative activities, thereby contributing to economic growth (Cortinovis, Crescenzi, & van Oort, 2020; Elekes, Boschma, & Lengyel, 2019).

A prime example of this phenomenon can be seen in Central and Eastern Europe (CEE), where MNCs dominate exports as the region's economic growth is primarily driven by foreign direct investment (Ban & Adăscăliței, 2022; Bohle & Regan, 2021).

However, empirical evidence indicates that while knowledge transfer to foreign affiliates does occur, there might be limited or even adverse spillover effects on domestic firms in host economies (Cortinovis et al., 2020; Papanastassiou et al., 2020).

This is attributed to a higher prevalence of related diversification within organisations and the MNCs' ability to protect knowledge leakage through property rights (Drahokoupil & Fabo, 2020; Sabbadin, De Noni, & Belussi, 2022).

Additionally, MNCs can create competition in both product and factor markets, leading to reduced productivity and innovation efforts in domestic firms at both regional and national levels (Knez, Jaklič, & Stare, 2021).

CEE occupies a unique position globally, Timișoara being no exception, acting as a key facilitator of the cost competitiveness of West European-centric global value chains, compared to their global rivals, mostly from Asian regions (Ban & Adăscăliței, 2022; Éltető & Medve-Bálint, 2023).

According to Bacarro and Hadziabdic (2023), countries like Romania in the CEE have undergone a significant transition over the past two decades. They have evolved from dependent market economies relying on FDI and consumer-led growth to becoming by 2020 export-oriented countries driven by FDI.

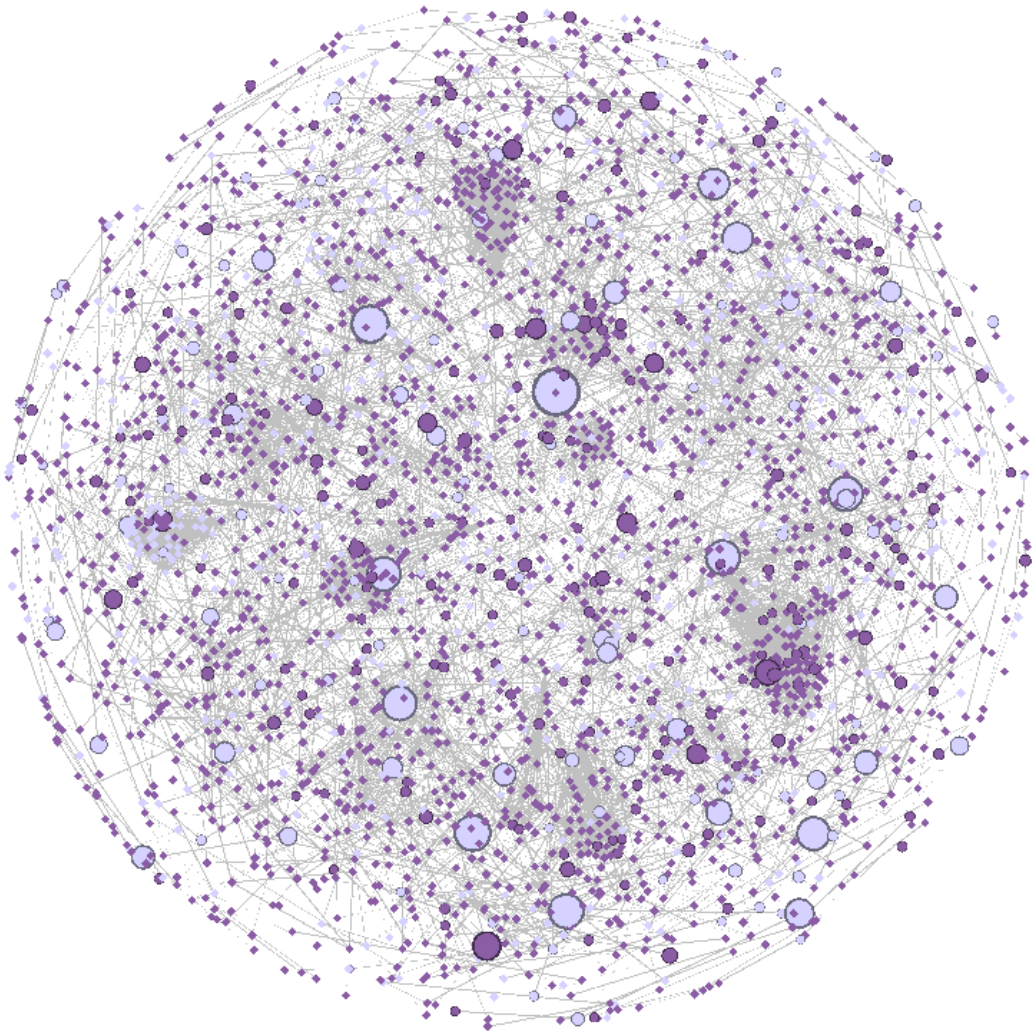
This shift has been facilitated by substantial growth in FDI-driven manufacturing sectors (Bruszt & Langbein, 2020; Éltető & Medve-Bálint, 2023) and the rise of offshoring FDI business services (Jipa-Muşat & Prevezer, 2023; Jipa-Muşat, Prevezer, & Campling, 2023).

Consequently, the intricacy of these economies has notably increased (see Figure 22), with countries such as Romania achieving export complexities comparable to those seen in Western European nations like Denmark or the Netherlands (Ban & Adăscăliței, 2022).

Technological upgrading, primarily driven by FDI, has been the main catalyst behind regional related diversification (Bohle & Regan, 2021; Elekes et al., 2019).

The analysis adopts the growth regime theory perspective to examine the organisation of capital ownership in Timiș, Romania, a pioneering region for Foreign Direct Investment (FDI) in the country since the 1990s (Sellar, 2013). Even in 2022, Timiș continues to stand out with the highest percentage of employees working for FDI companies, accounting for 68% of the region's workforce (Corodescu-Roșca, Hamdouch, & Iațu, 2023).

Fig. 49
The whole network of companies (2829) tied through ownership connections to the top 1000 Timiș.



Investment spillovers within and across sectors

Our research focuses on studying the integration of FDI within the broader economic structure and exploring spill-over effects both within and across economic sectors to understand related diversification processes.

We investigate whether FDI companies actively engage in the same sectors as domestic companies, establishing horizontal ownership ties, or if they operate independently.

To delve deeper into the interfirm relationships and ownership structures, we employ logistic regression and Exponential Random Graph Models (ERGMs) for network analysis. Specifically, we analyse the interfirm co-ownership network of the top 1000 companies in Timiș County, resulting in a dataset comprising 2,829 interconnected companies.

Our research aims to gain a comprehensive understanding of spillover effects by examining the distribution of investments across economic sectors. We specifically investigate whether FDI companies tend to invest in new companies within the same tradable sectors, while domestic companies predominantly operate in non-tradable sectors but venture into related ones.

Tradable sectors are those that produce goods and services easily exchangeable on the international market, facilitating exports and imports. Conversely, non-tradable sectors primarily cater to domestic demand and have limited involvement in international trade due to factors like perishability, localised services, or regulatory restrictions. A restaurant serving local customers is non-tradable, but if it attracts international tourists and exports culinary expertise through franchises, it may become tradable. Additionally, changes in technology and global economic dynamics can influence the tradability of sectors over time.

The distinction between tradable and non-tradable sectors is useful in order to grasp how an economy can achieve sustainable growth through diversification. Traditional economic development theories emphasise the importance of shifting resources, such as labour, from low-productivity with little added value from non-tradable services to higher-productivity tradable sectors like manufacturing and services. This transformation process is commonly known as “economic diversification”.

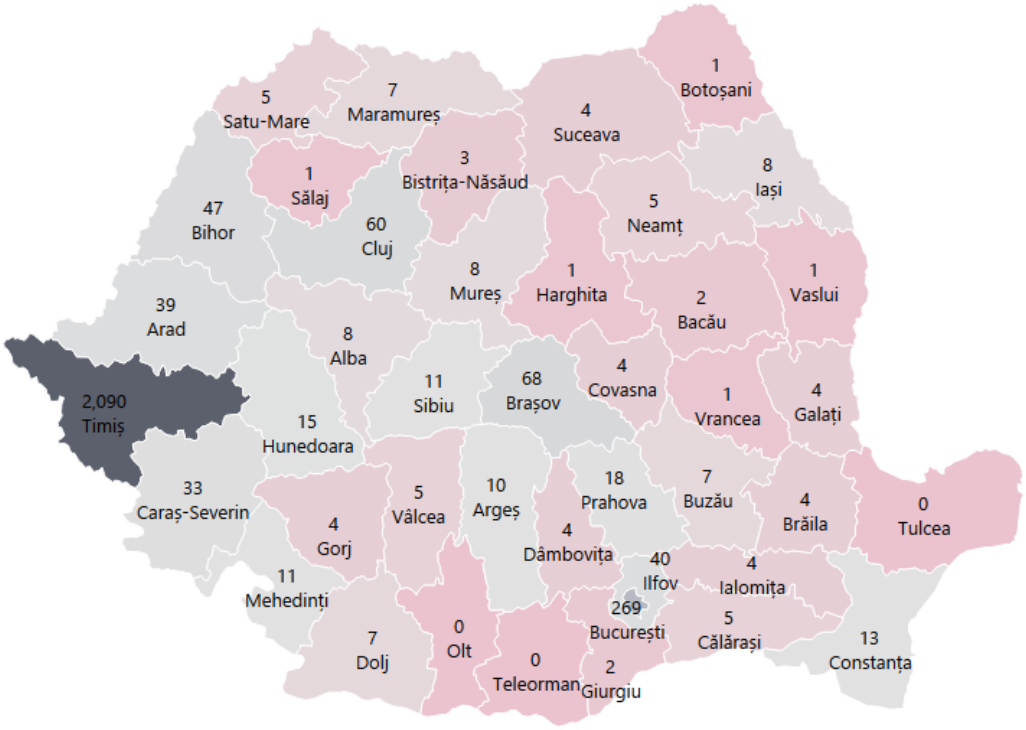
Our findings suggest limited horizontal spill-over of FDI into the domestic economy of Timișoara, even though FDI companies, being larger in terms of turnover and employees, are more likely to expand within the same sector by forming new companies within the region or at the national level (as indicated by the logistic regression results showing a prevalence in tradable sectors like electrical and electronics, chemicals, real estate, automotive, clothing & textiles, and IT&C).

In contrast, domestic capital is more prevalent in non-tradable sectors like education, sports, and medical. The ERGM results demonstrate that FDI

companies have a higher likelihood of forming ownership ties compared to domestic companies, but these ties are primarily intra-sectorial. Notable exceptions are domestic capital from the financial and medical sectors, which emerged as key investors in tech start-ups after 2020.

Additionally, higher and medium technological level companies, mostly FDI-companies, are more likely to form ties with companies of similar technological levels, while domestic capital is venturing into cutting-edge technological SMEs.

Fig. 50
The county distribution of the whole network of companies (2829) tied through ownership connections to the top 1000 companies from Timiș.



Tab. 18
Economic overview of top 12 counties hosting a network of 2829 companies linked via ownership to Timiș county's top 1000 companies..

Counties	Companies	Foreign companies	Turnover (mil euro)	Employees
Timiș	73.9%	68.7%	49.8%	64.8%
București	9.5%	17.8%	37.6%	16.7%
Brașov	2.4%	1.1%	3.9%	3.4%
Cluj	2.1%	2.4%	1.4%	1.4%
Bihor	1.7%	0.4%	0.2%	1.0%
Ilfov	1.4%	2.6%	0.8%	0.6%
Arad	1.4%	0.7%	0.8%	0.8%
Caraș-Severin	1.2%	0.4%	0.1%	0.1%
Prahova	0.6%	0.9%	0.3%	1.4%
Hunedoara	0.5%	0.0%	0.1%	0.1%
Constanța	0.5%	0.6%	1.1%	0.9%
Sibiu	0.4%	0.4%	0.4%	1.3%
Total	**2829 (100%)**	**540 (100 %)**	**15029 (100 %)**	**152149 (100%)**

Data and analytical strategy

We gathered data on the top 1000 leading employers in Timiș during 2022. The number of employees for each company was obtained from the Territorial Work Inspectorate of Timiș, while the turnover was obtained from the public balance sheets of the companies. To analyse ownership networks, we used The Official Monitor, Annex 3, which is legally required in Romania to publish company ownership details. The dataset was compiled by the company of BorgDesign who runs the portal listafirmelor.ro.

The data includes information about shareholders, their countries of origin, and the percentage of ownership they hold in each company. Additionally, we collected information on other companies associated with these shareholders, including ownership percentages, relationship types, and locations – in total another 1829 companies. The resulting network encompasses a total of 2,829 interconnected companies, representing a diverse range of economic categories

To construct the network, we developed an undirected and unimodal structure where nodes represent firms, shareholders, or company administrators. The attributes assigned to each node include the shareholder's country of origin, the degree of foreign capital participation in the company, the economic sector in which the company operates, and the number of employees in the company. Connections in the network are established based on the participation of a shareholder in multiple companies. We measured the strength of these connections using a weighted average that considers the common shares held by the shareholders.

Our first objective is to ascertain the key sectors in the economy that are predominantly dominated by FDI-companies and to profile their technological level, as well as size in terms of employees and turnover.

To achieve this, we employ logistic regression analysis, where FDI companies are coded as 1 and domestic companies as 0. By examining the coefficients of the logistic regression model, we can identify the characteristics associated with FDI companies (positive coefficients) and those attributed to domestic companies (negative coefficients).

This analytical approach offers valuable insights into the dynamics of various sectors and the ownership patterns within the business landscape of Timiș County, elucidating the unique roles played by FDI and domestic companies across different economic sectors.

Our second objective revolves around evaluating the emergence of new companies and their financing sources in the region. Despite the substantial presence of FDI-companies in various sectors, especially with regards to technological upgrading, we aim to investigate their role in financing new ventures within the local economy. Are these FDI-companies acting as catalysts for capital formation in the region?

Additionally, we seek to explore potential spillover effects concerning technology and firm size. To address these inquiries comprehensively, we employ an exponential random graph model (ERGM) regression to model the formation of ownership ties within the network of the top 1000 companies in Timiș County. This ERGM approach takes into consideration both the firm characteristics and the patterns of connections between them, known as the network structure, to predict the likelihood of tie formation.

Tab. 19
Sectoral distribution of the whole network of companies (2829) tied through ownership connections to the top 1000 companies from Timiș.

Sector	Top 1000 Timiș	All 2829 Companies	Foreign companies
Agriculture	5%	7%	8%
Industry	42%	30%	35%
Services	28%	42%	38%
Trade & Logistics	25%	21%	19%
Total	100% (1000)	100% (2829)	100% (448)

Tab. 20
Network structure of the whole network of companies (2829) tied through ownership connections to the top 1000 companies from Timiș.

Sector	Total ownership ties	Average ownership ties	Betweenness centrality	Closeness centrality
Agriculture	4%	1.45	**0.35**	**0.07**
Industry	27%	1.60	**0.38**	**0.16**
Services	55%	2.50	**0.97**	**0.30**
Trade & Logistics	14%	1.42	**0.5**	**0.11**
Total	100% (26,242)	1.83	**0.59**	**0.19**

Tab. 21
The characteristics and economic indicators of the top 1000 largest companies from Timiș

Measure	Timișoara	First Metro Ring	Second Metro Ring	Other	Timiș
Companies	48%	26%	7%	20%	100% (1000)
Foreign Companies	57%	21%	5%	18%	100% (289)
Employees	73%	16%	3%	8%	100% (135,413)
Turnover (mil euro)	72%	17%	4%	6%	100% (9,941)
Employees per company	214	89	60	56	140
Turnover per Employee (€/pers)	72,933	78,335	105,479	56,070	73,412

Our analysis focuses on two specifications: one examines ties among companies with similar characteristics (within similarities or homophily), while the other explores ties between companies with different characteristics (between similarities or heterophily). The combination of logistic regression analysis and ERGM regression enables a comprehensive understanding of the ownership network, including FDI and domestic firms' attributes, financing sources of new ventures, and interconnections among firms with similar and different characteristics. These insights shed light on the financing and spillover dynamics of new companies and the interplay between FDI and domestic firms in shaping Timiș County's economic landscape, contributing to a deeper understanding of its growth and development.

The univariate statistics of the comprehensive network of companies (2829) linked through ownership connections to the top 1000 companies from Timiș region provides an overview of the distribution of companies among different sectors and their ownership relationships.

Firstly, Foreign Direct Investment (FDI) companies constitute a significant portion (16%) of the entire network of companies, and they have a notable impact on the economy as they employ 54% of the total workforce and contribute to 74% of the aggregated turnover in Timiș, amounting to €15.32 billion. This highlights the crucial role of FDI in driving economic growth and generating substantial value within the region.

Secondly, the sectoral distribution of companies in the entire network reveals a dominant presence of the services sector, accounting for 42% of all companies, followed by the industry sector at 30%, trade & logistics at 21%, and agriculture at 7%. However, when focusing solely on the top 1000 companies, the industrial sector takes the lead with 42% representation, and services come in second with 28%. This shift in sectoral dominance indicates the significance of the local industrial presence in Timiș County, in contrast to the influence of external service-based companies investing in the region.

Thirdly, the services sector stands out in terms of ownership ties, with the highest number of connections (55% of all ties) between companies. This sector also exhibits a substantially higher average of 2.5 ownership ties per company compared to the network's overall average of 1.83. Moreover, the services sector's high betweenness centrality (0.97 compared to the network's 0.53) and closeness centrality (0.30 compared to the network's 0.19) indicate its crucial role as a key connector between other companies in the network's ownership structure. This suggests that the Services sector plays a vital role in facilitating economic interactions and collaborations among various companies in the region.

To sum up, the univariate results provide valuable insights into the economic structure of Timiș, Romania, with Foreign Direct Investment playing a significant role in employment and generating substantial turnover. The sectoral

distribution indicates the importance of the local industrial sector and the influence of external service-based companies. Additionally, the dominance of the services sector in ownership ties and its pivotal role in connecting other companies underscore its significance in fostering economic interactions and partnerships within the region's economic network.

Tab. 22
Top players from components with more than 300 employees and more than 3 connected nodes

Top Company	Sector	Firms	From Timiș	Employees	Turnover				
					Total	Agri.	Ind.	Serv.	Trade & Logistic
Fondul Proprietatea SA	Trade	726	44%	42,706	6.127	1%	15%	46%	38%
Cramele Recas SA	Food & drinks	47	80%	2,016	142	16%	49%	10%	26%
Aic Trucks SA	Trade	29	62%	1,139	135	0%	1%	7%	92%
Sport Mechanical Workshop SRL	Machinery & Equipment	20	95%	855	51	0%	50%	1%	49%
Agro Chirnogi SA	Agriculture	18	22%	2,112	178	70%	0%	1%	29%
Agroland Business System SA	Trade	14	79%	598	47	0%	0%	5%	95%
Bioclinica SRL	Medical services	12	33%	838	23	0%	0%	87%	13%
Super Ball SRL	Clothing & Textiles	11	27%	638	40	0%	96%	0%	4%
Contakt Express Logistik SRL	Trade	9	100%	586	17	0%	0%	0%	100%
Continental Automotive SRL	Automotive	8	50%	13,845	2.206	0%	91%	9%	0%
Smithfield Romania SRL	Food & drinks	8	63%	4,618	348	0%	100%	0%	0%
Eta2U SRL	Machinery & Equipment	8	100%	415	67	0%	87%	13%	0%
Cottontex SRL	Clothes &Textiles	7	86%	1,154	30	0%	96%	4%	0%
B.Braun Medical SRL	Trade	7	100%	1,145	96	0%	9%	39%	52%
Dar Draxlmaier Automotive SRL	Automotive	6	50%	7,390	165	0%	100%	0%	0%
Trw Automotive Safety Systems	Automotive	6	100%	2,988	323	0%	97%	3%	0%
Aem SA	Machinery & Equipment	6	17%	1,257	21	0%	100%	0%	0%
Rus SAvitar SA	Wood & furniture	6	100%	1,088	28	0%	97%	0%	3%
Ringier Romania SRL	IT&C	6	17%	471	34	0%	0%	100%	0%
Agil SRL	Food & drinks	6	67%	463	22	0%	93%	7%	0%
Elba SA	Electrical equipment	5	80%	1,067	52	0%	77%	5%	18%
Fartud SRL	Logistics	5	80%	538	30	0%	0%	13%	87%
Maracana SRL	Logistics	5	100%	418	15	7%	19%	0%	74%
Mondial SA	Machinery & Equipment	4	75%	777	43	0%	100%	0%	0%
Telco Pe SRL	Machinery & Equipment	4	75%	618	9	0%	91%	9%	0%
Premier Energy SRL	Energy industry	4	0%	431	189	0%	100%	0%	0%
Agrii Romania SRL	Chemical	4	25%	413	82	0%	100%	0%	0%
Kromberg & Schubert SRL	Automotive	3	33%	3,222	96	0%	100%	0%	0%
Zoppas Industries SRL	Electrical equipment	3	100%	3,040	165	0%	99%	1%	0%
Strabag SRL	Constructio n	3	0%	2,307	320	0%	73%	27%	0%
Holcim SA	Machinery & Equipment	3	0%	1,623	377	0%	100%	0%	0%
Porr Construct SRL	Constructio n	3	0%	813	178	0%	100%	0%	0%

Network Components and the Largest sub-network

Components: The firms in the network are not all directly connected to each other, but they are organised into separate groups called components or sub-networks. These components can be thought of as clusters of firms that have stronger connections within the group than with firms outside of it. In total, there are 525 components of various sizes, ranging from just 2 firms to as many as 726 firms.

Impactful Components: Some components have significant importance in terms of employment. Table 22 shows the most crucial components, which include those with at least 300 employees and at least 3 nodes. These firms collectively employ around 32% of the county's workforce. The three largest components alone employ approximately 29% of the total employees in the listed components.

Sector Contributions: Automotive manufacturing firms dominate the network in terms of their contributions to total turnover, accounting for about 19% of the combined turnover of all components listed. On the other hand, trade and logistics sectors lead in total turnover, contributing approximately 78% to the overall turnover. Agriculture and food and drinks manufacturing also play a significant role, contributing around 7% of the total turnover.

Largest Component (sub-network): The biggest component in the network has 726 firms, including 319 from Timiș and 94 foreign firms. It generates an impressive turnover of €6,127 million and employs 42,706 people. Fondul Proprietatea stands out in terms of employment and turnover. The companies in this large network can be further categorised based on their economic sector, providing insights into their interconnectedness and economic activities. The largest components significantly impact employment and turnover, with the automotive sector being crucial for turnover, while trade and logistics dominate the total turnover. Agriculture and food and drinks manufacturing also make noteworthy contributions to the county's economy.

Financial Services: This category consists of 69 firms with 1,437 employees and a turnover of €1,912.85 million. The firms show strong connections (node degree: 2144) and close interaction (average closeness centrality: 1).

Medical Services: This category includes 73 firms employing 7,849 people and having a turnover of €425.55 million. The firms have substantial connections (node degree: 3657) and relatively less interconnectivity (average closeness centrality: 1).

Automotive Manufacturing: This category has 4 firms with 166 employees and a turnover of €7.55 million. The firms have fewer connections (node degree: 106) and less interconnectivity (average closeness centrality: 0.73).

IT&C: This category consists of 55 firms with 5,506 employees and a turnover of €224.54 million. The firms have a moderate level of connections (node

degree: 1178) and relatively good interconnectivity (average closeness centrality: 1).

The Agriculture category consists of 34 firms with 452 employees and a turnover of €82.69 million.

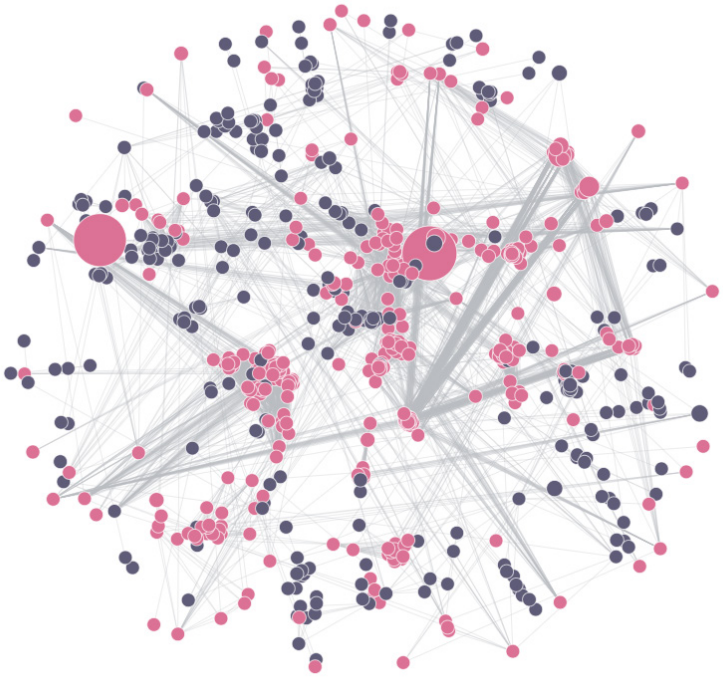


Fig. 51 —The largest sub-networks from the whole network of companies (2829), based on location.

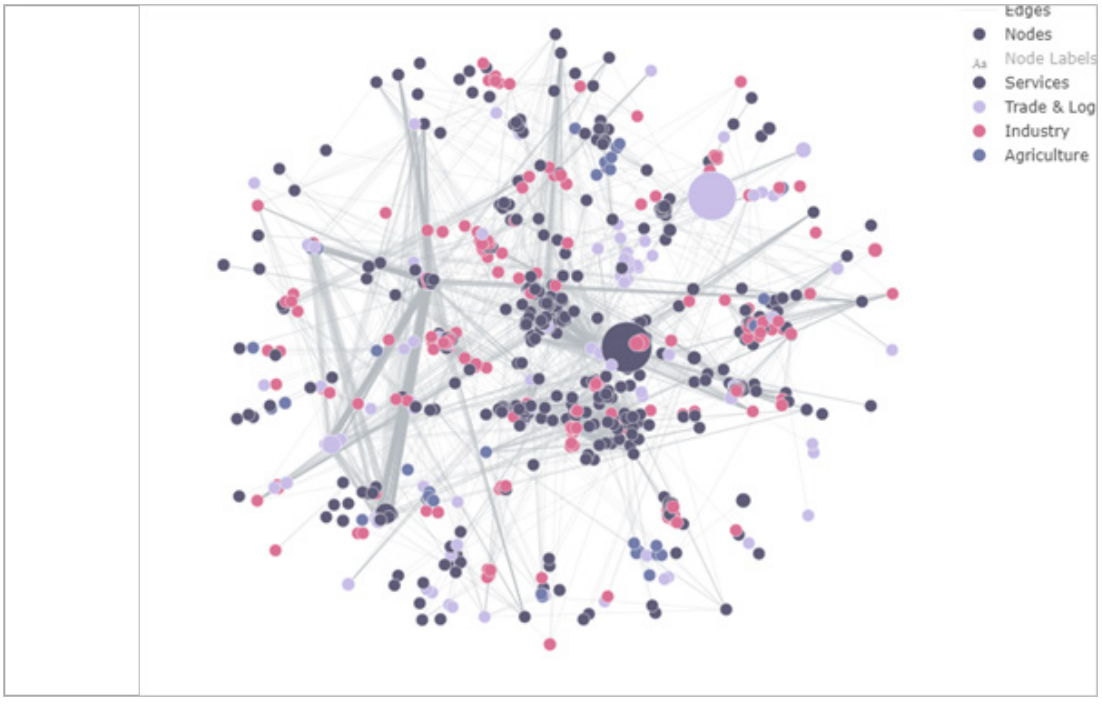


Fig. 52
The largest sub-networks from the whole network of companies (2829), based on sector.

Top 6 largest networks excluding the principal component

Component 2 is a prominent cluster of Timiș-based firms with Romanian capital, comprising 47 entities. It focuses on the food and drinks sector, led by Cramele Recaș and Annabella, with its retail chain and Râureni canning factory. Within this component, 41 firms are in Timiș, accounting for 89.9% of the total turnover. The agricultural sector has 18 firms, contributing 15.71% of turnover, while the Food and Drinks Manufacturing category, with only 3 firms, dominates turnover, led by Cramele Recaș S.A. and Annabella Fabrica de Conserve Raureni S.A. The trade sector employs 53.8% of the workforce, led by Annabella SRL, employing 48.6% of the total workforce.

Component 3 is unique in the network, featuring a tightly interconnected business group called RPC Group, primarily focused on real estate development. It comprises 43 Romanian-owned companies concentrated in Dumbrăvița, adjacent to Timișoara. The firms mainly engage in construction activities, with 37 construction enterprises that are operating in Timiș and Bucharest.

Component 4 comprises 29 companies in Timiș County, presenting a diverse cluster. The logistics sector plays a significant role, with Dunca Expediții SA and Nordica Turism SRL contributing notably to turnover and employment. Additionally, FDI companies like AIC Trucks SA and Automotive Investment Corporation SRL focus on trade with the logistics sector. Despite being only four out of the 29 companies, these FDI firms contribute 63.7% of the total turnover and employ 40.3% of the workforce. The component also includes companies from IT&C, professional services, real estate, and construction, showcasing economic diversity within the cluster.

Component 5 is a logistics-focused cluster, benefiting from Timiș county's strategic location as a border county adjacent to Hungary and Serbia. Among the 22 companies, logistics firms employ 48.8% of the workforce and generate 78.6% of the total turnover. Notable players include All Cargo Express Srl and MTV Logistics of Timișoara, both part of the MTV Logistik Group. Most companies in this cluster are locally owned with Romanian capital, mainly concentrated within Timiș County. There is a single foreign direct investment (FDI) firm, Euro Destock SRL, and only two companies operating beyond Timiș County, highlighting the significance of Romanian-owned businesses in the region's economic activity.

Component 6 is an agriculture-centred cluster with 20 companies, all locally owned with Romanian capital. Fourteen firms are in Timiș county, while six are in neighbouring Arad county. Nineteen firms operate in agriculture, with a single firm engaged in trade, Timlactagro Cooperatia Agricola. It stands out as the leading company in terms of turnover and employee count within the component and the only one from the original top 1000 Timiș firms in this cluster. Established in 2009, Timlactagro Cooperatia Agricola was the first

milk cooperative in Romania, formed through collaboration between farmers from Timiș and Arad counties.

Component 7 comprises 12 firms, primarily in the medical services sector (9 firms), with additional firms in real estate (3 firms) and trade (1 firm). Bioclinica SA stands out with the highest turnover, having seven affiliated firms in the network. Geographically, four firms are in Timiș County, while the others are spread across various Romanian counties, from Arad to Constanța. This component exemplifies a local private medical business originating in Timișoara, expanding its operations to multiple regions within the country.

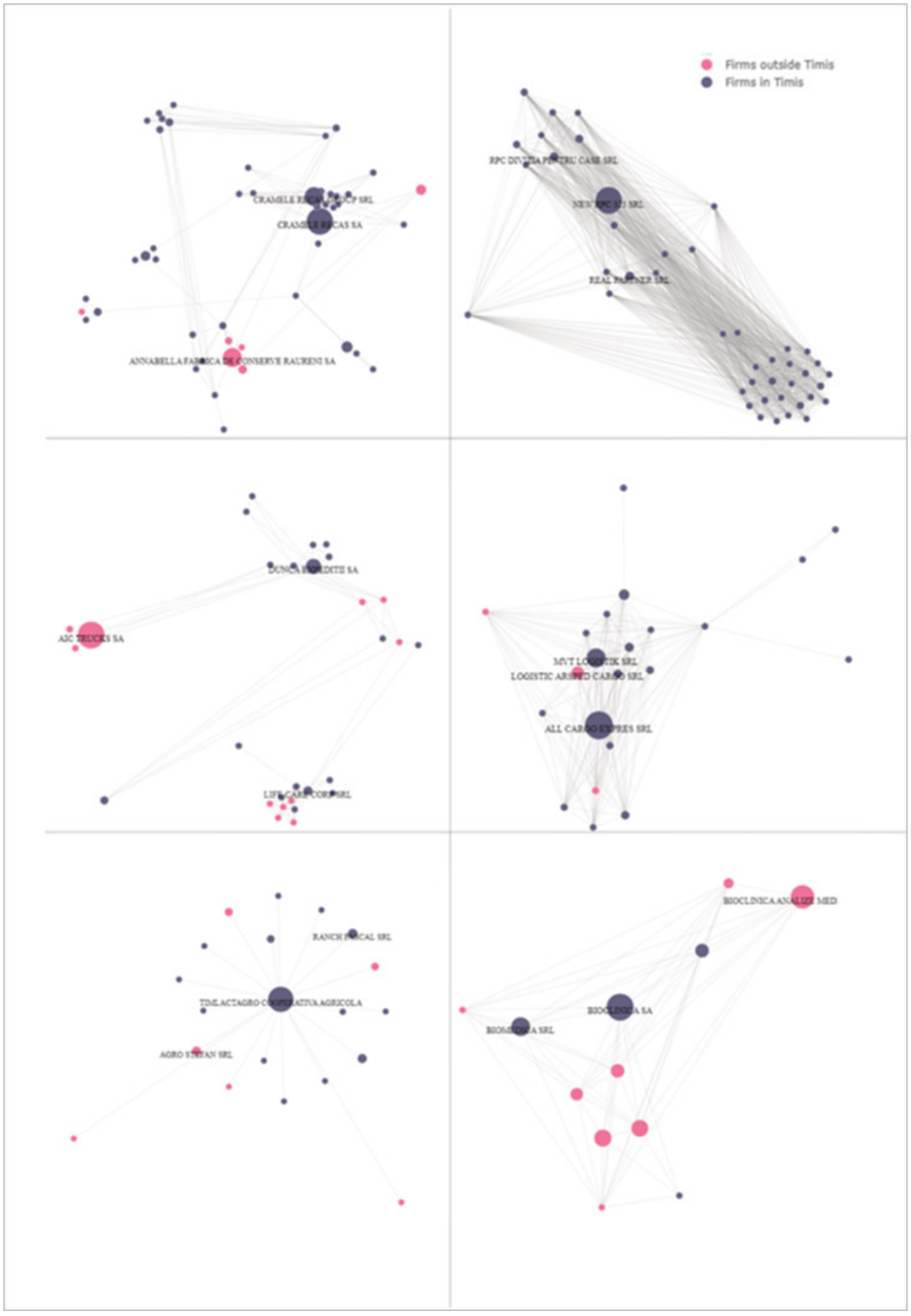


Fig. 53 —Top 6 largest networks (excluding the principal component).

Analytic strategy. We conducted a study using logistic regression models to explore the attributes of Foreign Direct Investment (FDI) companies in Timiș County and their comparison with domestic companies. Logistic regression is a statistical method used to predict binary outcomes, which means it's used when the result of an event can only have two possible values, in this case FDI-company vs. domestic company. The models progressively added new variables to assess their impact on FDI likelihood. We analysed size and location, economic sector, and technological level attributes.

Size and location. The results showed that as we incorporated more attributes, the models demonstrated better explanatory power, indicating their effectiveness. Larger turnover and more employees were associated with a higher likelihood of a company being classified as an FDI company. Surprisingly, FDI companies in Timiș were less likely to have headquarters in Timiș, with many located in Bucharest or Cluj.

FDI-companies. The inclusion of economic sector variables highlighted that FDI companies were more prominent in specific sectors, such as electrical and electronics, chemicals, real estate, automotive, clothes & textiles, and IT&C. Conversely, certain sectors, like energy, education and sports, medical, and financial, were more dominated by domestic companies. While it remains true that FDI companies in Romania are often associated with tradable sectors, there are significant nuances to consider. The automotive sector in Timișoara, for example, has experienced remarkable growth and emerged as a leading sector for exports. FDI in Timișoara is particularly drawn to sectors linked to the automotive supply chain, such as electrical and electronic manufacturing, as well as the chemical industry, which evolved from the internationalised textile industry established in the pre-socialist era and expanded through socialist investments.

The domestic capital not-surprisingly dominates non-tradable sectors. The financial sector and medical companies also play significant roles in the country's entrepreneurial landscape.

It's worth noting that the financial sector, mainly composed of financial companies rather than banks, has witnessed a surge in new start-ups since the 2020s, driven by post-pandemic funds, surplus capital, and a focus on digitalization and AI-powered technologies. While many of these companies are domestically owned, a notable number have foreign shareholders with substantial stakes, demonstrating a shared interest in the country's development.

Additionally, medical companies have a central role in Timișoara's entrepreneurial scene, with a significant proportion of domestic ownership. Unirea Medical centre, founded by cardiologist Wargha Enayati, is a prominent example. The company has expanded its services through acquisitions and greenfield projects across various Romanian cities. In 2011, Advent International acquired a significant stake in the company, leading to the

establishment of the Regina Maria Health Network brand, which now operates multiple hospitals and collaborates with clinics across the country, serving thousands of patients. Banca Transilvania, Romania's largest domestic bank, also plays a crucial role as a partner to UMC, providing office space and financial services.

It's worth noting that the financial sector and medical companies exemplify how domestic and foreign elements coexist in Romania's investment landscape, contributing to its economic growth.

Tab. 23 —Characteristics of Companies Based on Logistic Regression Analysis: 1/+: Indicates FDI Companies, 0/-: Indicates Domestic Companies. Blue signifies a direct proportional relationship, while red indicates an inverse proportional relationship.

Statistical significance level
*** p<= 0.001
** p<= 0.010
* p<= 0.050.

In parentheses standard errors. Models: 1. Poisson generalised mixed model; 2-4 Generalised mixed model with Gamma log link

	Attributes of the FDI companies	Model 1	Model 2	Model 3
Size and location	Turnover (logarithmic scale)	0.213 ** (0.074)	0.184 * (0.080)	0.196 * (0.080)
	Employees (logarithmic scale)	0.201 ** (0.066)	0.205 ** (0.074)	0.197 ** (0.075)
	Company located in Timiș	-0.324 ** (0.106)	-0.531 *** (0.117)	-0.515 *** (0.117)
Economic sector	Electrical and Electronics		3.424 *** (0.625)	1.959 * (0.842)
(reference: other sectors)	Chemical		2.514 *** (0.539)	1.628 * (0.656)
	Real Estate		1.439 *** (0.161)	1.673 *** (0.180)
	Automotive		1.469 *** (0.288)	1.076 ** (0.372)
	Clothes & Textile		1.176 *** (0.316)	1.043 ** (0.334)
	ITC		1.158 *** (0.202)	0.844 *** (0.234)
	Construction		-0.505 ** (0.183)	-0.640 ** (0.212)
	Energy		-0.828 (0.479)	-0.956 (0.490)
	Education and Sport		-1.257 *** (0.306)	-1.199 *** (0.310)
	Medical		-2.007 *** (0.468)	-2.332 *** (0.483)
	Financial sector		-2.096 ** (0.726)	-2.399 ** (0.734)
Technological level	High			1.328 * (0.580)
(reference: non-technological)	Medium			0.182 (0.189)
	Low			-0.369 * (0.166)
Modell fit	AIC	2694	2384	2369
	BIC	2718	2474	2477
	Pseudo-R^2	4%	21.4%	22.4%

Analytical strategy. The aim of the logistic regression analysis was to investigate factors related to companies connected to the financial sector. Logistic regression is a statistical method used to predict outcomes where there are only two possible values, such as financial companies vs. other companies. The findings highlighted the significant role of the financial sector in specific economic branches, including Information Technology and Communication (ITC), Real Estate, Energy, and Medical. Furthermore, companies with a Medium technological level demonstrated a noteworthy association with being connected to the financial sector.

In terms of **size and location** attributes, the analysis indicated that turnover (measured on a logarithmic scale) had a positive correlation with connections to financial firms. This suggests that companies with higher turnovers are more likely to have links with the financial sector. However, the number of employees (logarithmic scale) did not show a significant influence on such connections.

Foreign companies also demonstrated a positive association with being connected to financial firms, implying that companies with foreign capital are more inclined to establish ties in the financial sector. This finding suggests that foreign investments and cross-border collaborations contribute to the connectivity between financial firms and other companies.

Analysing the **economic sectors**, several notable findings emerged. The real estate sector displayed a strong positive association with connected companies, indicating that firms within this sector are more likely to have ties with financial firms. Conversely, the electrical and electronics sector showed a negative association, suggesting that companies in this sector are less likely to be connected to financial firms.

The ITC sector also exhibited a positive association with financial-companies, indicating a strong relationship between this sector and the financial sector. Similarly, the energy and medical sectors demonstrated positive associations, highlighting their significant connections to financial firms. On the other hand, the automotive, clothes & textile, construction, education and sport sectors did not appear to have a significant influence on connections to financial firms.

The Financial sector itself displayed a strong positive association with connected companies, emphasising the interconnectedness within the financial sector. Financial firms were more likely to have connections with other companies in this sector, underscoring their role as central actors within their own network.

Technological levels. Medium level companies showed a positive correlation with financial companies. This suggests that firms with a moderate level of technological advancement are more prone to establishing connections with financial firms. However, no significant associations were observed for the

High and Low technological levels. The substantial presence of firms from the knowledge intensive sector, accounting for 42% of all connected firms, might contribute to the importance of the medium-technological level.

To sum up, the results show the role of the financial sector in specific sectors, such as ITC, real estate, energy, and medical, as well as in the medium technological field. Understanding these relationships can contribute to a deeper understanding of the interconnections between various economic sectors and the financial landscape, informing future research and policy considerations in promoting financial support and collaborations within specific industries.

Tab. 24 —Attributes of the companies connected to the financial sector in Timiș County, Romania: logistic regression (1/+: Connected to financial companies, 0/-: Not connected).

Statistical significance level
*** p<= 0.001
** p<= 0.010
* p<= 0.050.

In parentheses standard errors. Models: 1. Poisson generalised mixed model; 2-4 Generalised mixed model with Gamma log link

	Attributes of the connected to financial companies	Model 1	Model 2	Model 3
Size and location	Turnover (logarithmic scale)	0.114 (0.076)	0.234** (0.084)	0.238** (0.084)
	Employees (logarithmic scale)	-0.089 (0.074)	-0.035 (0.081)	-0.027 (0.082)
	Foreign companies	0.241 (0.140)	0.312* (0.153)	0.311* (0.154)
Economic sector	Energy		1.667*** (0.278)	1.927*** (0.321)
(reference: other sectors)	Real Estate		0.894*** (0.189)	0.901*** (0.206)
	Medical		1.156*** (0.219)	0.887*** (0.258)
	ITC		1.491*** (0.210)	0.216*** (0.250)
	Automotive		- 0.391 (0.485)	- 0.568 (0.674)
	Clothes & Textile		-1.768 (1.017)	-1.521 (1.029)
	Construction		- 0.179 (0.200)	-0.076 (0.255)
	Chemical		-13.575 (339.614)	-13.7888 (334.890)
	Education and Sport		- 0.148 (0.250)	-0.227 (0.255)
	Electrical and Electronics		- 0.228 (0.632)	- 0.571** (0.074)
Technological level	High			0.584 (0.906)
(reference: non-technological)	Medium			0.518* (0.240)
	Low			0.253 (0.214
Modell fit	AIC	2393	2155	2829
	BIC	2417	2245	2263
	Pseudo-R^2	0.3%	15.7%	15.9%

Analytical strategy: Exponential Random Graph Model (ERGM) was used to explore the investment patterns, a statistical tool that helps us understand how connections among companies form and what factors influence their existence. We investigate two specific setups: one concentrates on the probability of connections between companies with similar characteristics (referred to as within similarities or homophily), while the other explores the likelihood of ties between companies with different characteristics (referred to as between similarities or heterophily).

Goodness of fit. The estimated coefficients in the ERGM were obtained using the Stochastic Approximation Maximum Likelihood method. The Monte Carlo Standard Error (MCSE), estimated through simulations, quantifies the uncertainty associated with model parameters. Smaller values indicate higher precision, yielding more reliable and stable results. The within and between homophily models demonstrate a good fit to observed data, with precise and reliable parameter estimates (MCSE = 170 and 228, respectively).

The results revealed that domestic companies were less likely to form ownership ties compared to FDI companies. Domestic companies may have lower tie formation levels, indicating potential differences in networking strategies or access to resources. In contrast, FDI companies are more inclined to form ties, especially within their own network.

On the one hand, the estimate for the effect of company type (Domestic vs. FDI) was -0.254 (SE = 0.025) in the between homophily model, indicating a significant negative relationship between domestic companies and tie formation.

On the other hand, FDI companies showed a higher tendency to form ties with other FDI companies, with an estimate of 0.833 (SE = 0.076) in the between homophily model, suggesting a strong positive relationship. The probability of forming an ownership tie is 0.697.

The between homophily model showed the impact of economic branches on tie formation in other branches. In the between homophily model, certain branches like medical, financial, real estate, and ITC displayed a positive association with tie formation, meaning they were more likely to form ownership ties with other companies. On the other hand, branches like education and sports, automotive, electrical and electronics, energy, construction, clothes & textile, and chemistry showed a lower likelihood of tie formation.

The medical branch had a particularly strong positive effect, with an estimate of 0.890 (SE = 0.054) and a probability of a positive effect of 0.709. This indicates that companies within the medical branch are more likely to form ownership ties with other companies.

Similarly, the financial, real estate, and ITC (Information Technology and Communication) branches also exhibited positive effects on tie formation. The

estimates for these branches were 0.443 (SE = 0.062), 0.298 (SE = 0.047), and 0.191 (SE = 0.051) respectively. That is, the probabilities of forming ties ranged from 0.548 to 0.609.

These findings shed light on the factors influencing tie formation patterns between different types of companies and economic branches. It shows how networking behaviours vary between domestic and FDI companies and how certain economic sectors are more likely to form ties with others, contributing to a better understanding of business connections and collaborations.

The within homophily specification also sheds light on the impact of economic branches on tie formation.

The medical branch displayed a strong positive effect, with an estimate of 1.574 (SE = 0.292) and a high likelihood (probability of 0.828) for companies within this sector to form ties with others. Similarly, the financial, real estate, and IT&C sectors showed positive effects, with estimates ranging from 1.163 to 1.717 and probabilities of tie formation from 0.762 to 0.848.

The financial, medical, IT&C, and real estate sectors, which are predominantly driven by domestic and FDI capital, play crucial roles in the local economic ecosystem. They serve as sources of capital and act as key branches for financing new ventures and supporting emerging companies.

The technical level of companies affects their likelihood of forming ownership ties. Companies with medium and low technical levels are less likely to form ties, while those with a medium technical level have a slightly higher chance of forming ties.

When companies form ties with others at different technological levels, those with medium and low technical levels have negative effects on tie formation, meaning they are less likely to connect. Low technical level companies show an even stronger negative effect, indicating they are even less likely to form ties with companies at a different technological level.

However, when companies form ties with others at similar technological levels, medium technical level companies have a positive effect on tie formation, indicating they are more likely to connect. Interestingly, high technological level companies don't show a significant effect on tie formation, suggesting they are less likely to form ties among themselves, but more likely to form ties with lower technological level companies.

The network structure also has a significant impact on tie formation. When there are more existing connections (edges) in the network, the likelihood of forming new ownership ties decreases. This means that as the network becomes more interconnected, companies are less likely to form new ties.

Additionally, companies tend to form ties with other companies that already have a higher number of connections (2nd and 3rd degree nodes) in the network. This indicates a preference for connecting with well-connected partners.

Interestingly, companies are less inclined to form ties with other companies that have shared partners in the network. They prefer to connect with partners

who have fewer common connections. This reduces the tendency for clusters or groups of interconnected companies to form.

To sum up, domestic companies were less likely to form ownership ties compared to FDI companies. Some branches, like medical, financial, real estate, and IT&C, showed positive associations with tie formation, while others, including education, sports, automotive, electrical, electronic, energy, construction, clothes & textile, and chemical, had reduced probabilities of tie formation. Higher and medium technical levels had higher probabilities of tie formation with companies of similar technological levels. Companies with similar size increase the likelihood and higher turnover decreases it. Companies preferred connecting with highly connected nodes, reducing ties with companies having shared partners. Network structure significantly impacted tie formation, as increased network edges decreased the likelihood of new ownership ties.

Tab. 25
Ownership tie formation between companies Timiș: exponential random graph model

Statistical significance level
*** p<= 0.001
** p<= 0.010
* p<= 0.050.

In parentheses standard errors.

	Edge formation	Between homophily (factor)		Within homophily (match)	
		Estimates (SE)	Probability of Positive Effect	Estimates (SE)	Probability of Positive Effect
Company Type	Domestic compared with FDI companies	-0.254*** (0.025)		-0.721***(0.048)	
	FDI companies with themselves			0.833***(0.076)	0.697
Economic Branch	Medical	0.890*** (0.054)	0.709	1.574***(0.292)	0.828
	Financial	0.443*** (0.062)	0.609	1.717***(0.430)	0.848
	Real Estate	0.298*** (0.047)	0.574	0.762***(0.149)	0.682
	ITC	0.191*** (0.051)	0.548	1.163***(0.291)	0.762
	Education and Sports	-0.262*** (0.059)		0.004(0.168)	0.501
	Automotive	-0.378* (0.155)		2.020**(0.620)	0.883
	Electrical Electronic	-0.593** (0.185)		0.928(1.310)	0.717
	Energy	-0.755*** (0.055)		2.646***(0.438)	0.934
	Construction	-0.945*** (0.038)		1.080***(0.135)	0.747
	Clothes & Textile	-1.006*** (0.105)		1.211(0.815)	
	Chemical	-1.015*** (0.229)		2.551(1.694)	
	Other branches	(reference)		-0.654***(0.046)	
Technical level	High	-0.387* (0.185)		0.928(0.754)	0.717
	Medium	-0.966*** (0.036)		0.210**(0.068)	0.552
	Low	-1.094*** (0.027)		-0.493***(0.053)	
	No technical level	(reference)			
Company size	Employees (log scale)	0.007(0.009)		0.038***(0.009)	0.510
	Turnover (log scale)	-0.044***(0.002)		-0.064***(0.002)	
Network structure	Edges	-2.791*** (0.058)		-3.550***(0.039)	
	Degree 2nd	5.091***(0.213)	0.994	7.748***(0.792)	1.000
	Degree 3nd	3.687***(0.213)	0.976	5.997***(0.789)	0.998
	Geometrically weighted edgewise shared partner	-0.031(0.023)		-0.058**(0.018)	
Fit Measures	AIC	179292		171367	
	BIC	179583		171697	
	Monte Carlo St. Error	228		170	

Vukov (2019) underscores the automotive industry's successful utilisation of Romania's developmental state capacities and integration into the European Union. This integration not only fostered low-skill employment through FDI-led integration into global value chains (Nölke and Vliegenthart, 2009) but also spurred technological advancements and research centres (Ban, 2019). Timișoara, as a host city for these developments, witnessed the establishment of engineering centres and local supply network growth with companies like Continental, Nokia, Bosch, and Dräxlmaier. Government oversight and strategic decisions by the local administration influenced this progress (Sellar, 2013).

The chemical sector in Timișoara faced challenges similar to the rest of Romania, as noted by Mihály (2022). Transnational integration regimes with FDI dependence and mass privatisation, coupled with low state bargaining power, led to difficulties in market insertion for the sector (Mihály, 2022). In Timișoara, the contraction of the chemical industry was due to the loss of regional supply chains for key petrochemical factories (Jigoria-Oprea and Popa, 2016; Voiculescu and Jucu, 2014).

Despite challenges, the chemical sector's historical context, its pre-socialist integration into global supply chains, and the emergence of the automotive industry as a key client facilitated its transition during the new era of FDI-led growth. These factors show the complex interplay of historical precedents, ownership changes, and market demands shaping the sector within the FDI-led growth context.

The real estate sector in Timișoara has surprisingly witnessed increasing internationalisation. Traditionally dominated by local capital in Central and Eastern Europe (Pobłocki, 2021), data from Timișoara shows growing FDI influence, particularly in the corporate sector, while construction companies remain domestic. The construction sector's unique capital requirements, project-specific employees, and long product life cycles make it sensitive to monetary, financial, and regulatory changes with macroeconomic implications (Kohl and Spielau, 2018).

Conducive macroeconomic conditions, such as domestic capital availability and lower costs, along with effective demand, are crucial for the sector's growth. However, these conditions often conflict with export-oriented manufacturing firms' needs, which require low labour costs, low inflation, and undervalued exchange rates (Baccaro et al., 2022). Kohl and Spielau (2018:101), note that "construction companies benefit from the opposite monetary conditions than export-oriented manufacturing firms." The real estate sector plays a central role in driving economic growth, absorbing excess capital through property fluidity (Aalbers and Christophers, 2014; Fernandez et al., 2016). Housing serves as a mode of capital circulation, social relationships, and ideology, stimulating consumption when productive investments' returns decline (Christophers, 2018). In globalising cities, residential real estate can

also act as a “safe deposit box” for storing excess capital without alternative productive investments (Fernandez et al., 2016).

In Timișoara, the real estate sector experienced internationalisation through local entrepreneurs’ involvement, leveraging excess liquidity during and after the COVID-19 pandemic to negotiate capital investments with FDI companies. Meanwhile, construction companies remained domestically oriented. This highlights the distinct dynamics and interactions between the real estate and construction sectors in Timișoara, where local brokers played a pivotal role in attracting FDI investments while the construction sector stayed predominantly domestic.

Wage Growth and Moderation

Enclave Economies and Spatial Dynamics

This chapter explores the spatial dynamics of the labour market at the subnational level, providing insights into wage moderation and repression in export-led growth regimes in Central and Eastern Europe. Specifically, we investigate the spatial concentration of specialized economies within periurban areas of cities, where the regional labour force is leveraged to moderate wage increases and attract populations in economies heavily reliant on FDI, in three cities in Romania: Cluj-Napoca, Timișoara and Zalău. We argue that this leads to the formation of 'enclave economies', characterized by localized labour regimes shaped by territorial zoning strategies that regulate labour migration and economic zoning of capital. Employing company level data and semi-structured interviews, we model population change and concentration to identify different labour regimes in regional enclaves, examining the impact of migration and commuting of labour regimes. Our findings demonstrate that the sub-national distribution of FDI-led growth in Romania primarily revolves around labour-intensive activities and low capitalization costs, rather than urbanization. Additionally, this study identifies a dual labour division with fully urban proletarians and rural partially proletarized populations, highlighting limited alternative income options for the former and a combination of labour income and subsistence farming for the latter within households and villages. Furthermore, our analysis captures the specific labour requirements of multinational firms operating in business services and manufacturing, highlighting the negative impact of foreign companies in the business service sector on the population of core cities.

Wage moderation through Enclave Economies

This chapter explores the spatial dynamics of the labour market at the subnational level, providing insights into the strategies of moderation of the wage growth in export-led growth regimes in Central and Eastern Europe. Expanding on the concept of the 'enclave economy', which pertains to localized labour regimes, our research endeavours to investigate the spatial dynamics of the labour market at the subnational level. The "enclave economy" concept elucidates how export-oriented economies, like Romania, have been able to repress wages while simultaneously experiencing wage growth rates that surpass European averages. Romania's wage growth reached 8% in 2021, compared to the EU average of 3%. In export-led economies, governments prioritize cost competitiveness and implement restrictive macroeconomic policies that shape urban spaces, foster inter-institutional collaborations, and influence labour regulations.

In recent years, the global economic landscape has witnessed a profound shift, particularly within the Central and Eastern European (CEE) region. The conventional wisdom surrounding economic growth models has evolved to emphasize the demand side of the economy and the intricate coalitions formed among businesses, labour, and the state. These coalitions strive to create flexible yet stable forms of aggregate demand, marking a significant departure from previous paradigms. However, a notable research gap exists when it comes to understanding the mechanisms of wage repression or wage boosts, especially at the subnational level.

In the context of CEE, where export-oriented foreign direct investment (FDI) plays a pivotal role, the region has taken on a distinctive role as a key enabler of cost competitiveness for Western European-centric global value chains. This transformation from dependent market economies to export-oriented nations driven by FDI has been particularly evident in Romania and other CEE countries over the past two decades. FDI has fuelled significant growth in manufacturing sectors and the emergence of offshoring FDI business services.

The comparative framework considers three different cases from Transylvania and Banat, the region with the largest FDI flow in Romania (excluding the capital), as they present contrasting scenarios.

Cluj, the fastest-growing urban agglomeration in Romania after the capital, has witnessed remarkable employment growth in both white-collar and blue-collar jobs. However, most of the blue-collar jobs are in the periurban area.

Timișoara, the third-largest urban agglomeration in Romania, experienced a boost in manufacturing and business services primarily within the core city.

Similarly, Zalău, a regional capital and five times smaller than the previous two cities, also registered a significant increase in blue-collar employment since

2011, with workers coming from within the city and commuting from the entire region.

FDI-led growth in Romania is associated with periurbanization around major cities, rather than deeper urbanization. Unlike other global semi-peripheries, FDI in Romania does not drive the urbanization of labour reserves from rural areas. Instead, it reorganizes the labour force through commuting, leading to higher disposable incomes in villages and maintaining population levels. As a result, there are long factory commutes to the modernized villages with improved living conditions. Moreover, to address their demographic crisis, cities are increasingly tapping into the rural population to fill blue-collar jobs in the manufacturing sector.

Transnational enclaves are shaped by territorial zoning strategies that involve the establishment of special economic zones for capital and the regulation of internal and transnational migration for labour. Romania's business services sector, much like global peripheries, heavily relies on FDI and operates independently from traditional domestic manufacturing. This sector, primarily located in capital cities and second-tier cities like Cluj, Timișoara, and Iași, involves alliances among elites who influence regional institutional changes through incentives, education restructuring, corporate elite nurturing, and labour regime reshaping. While this arrangement has led to the development of a highly skilled workforce competitive on a European and global scale, it has also resulted in suppressed wage growth, keeping them below the European averages.

Building on Burawoy's extension of Gramscian concepts to workplace dynamics, the notion of "dual labour regimes" distinguishes between despotic labour regimes characterized by coercive discipline and the constant threat of unemployment, and hegemonic labour regimes where workers willingly accept exploitative conditions driven by competition. However, the 2008 Great Recession resulted in austerity measures and structural reforms, leading to a decline in private sector wages and reduced household income.

These transformations created a division between old manufacturing sectors characterized by a high prevalence of minimum wage employees and new post-socialist business service sectors with above-median wages.

To address the framing issue related to "dual labour markets", we introduce the concept of "hegemonic despotism" within the framework of transnational economic enclaves. In contemporary capital mobility arrangements, collective bargaining has shifted to cities and regions, resulting in a hybrid labour regime known as "hegemonic despotism".

These regimes coordinate the interests of capital and labour, with labour concessions based on the relative profitability of companies compared to other potential locations and associated profits. This conceptualization leads to subnational variations in labour regimes, giving rise to a plurality of labour regimes, particularly prominent in CEE. Recognizing the diverse and multifaceted nature of labour regimes is crucial for a deeper understanding of the enclave economy concept and its impact on income distribution.

This chapter study relies on interviews with workers from three major manufacturing companies and the managers of these firms. This approach enables us to gain a comprehensive understanding of the labour dynamics, wage structures, and broader economic implications within these subnational enclave economies.

Worker Interviews: To capture the firsthand experiences and perspectives of labour force participants, we conducted structured interviews with employees from the selected manufacturing companies. These interviews allowed us to explore their employment backgrounds, place of residence, educational qualifications, age, and job positions. The insights gathered from these interviews are invaluable in shedding light on the lived experiences of those directly impacted by the enclave economy.

Manager Interviews: Complementing the worker interviews, we also engaged in structured interviews with company managers and representatives from the selected manufacturing firms. These interviews were instrumental in uncovering the companies' strategies, labour policies, and perspectives on the economic dynamics of the enclave economies.

Subnational and sectorial variation in wages

What do we want to understand? We want to make sense of the wage growth in Romania and the sectorial and regional variations in the selected city-regions. Romania has seen steady wage growth surpassing since 2010 the EU-28 rate. H

However, wages in Romania, on average, remain notably below the European average. Moreover, significant wage disparities exist across sectors and city-regions, with Cluj-Napoca, Timișoara, and Bucharest experiencing substantial annual increases, while Zalău consistently lags behind the national average. The manufacturing sector outpaces business services in growth but has lower net salaries. In contrast, the Business Services sector in Romania, especially in Cluj, consistently sees rising salaries, with geographic location playing a significant role.

The annual percentage change from 2010 to 2022 was computed using the Purchasing Power Parity (PPP) conversion factor, which normalizes GDP figures to a standardized currency and adjusts for variations in price levels among countries (World Bank, 2022). Employing the PPP conversion factor enables the comparison of salary changes across different regions and sectors, accounting for disparities in local price levels and currency values.

This approach facilitates a more meaningful and internationally comparable analysis of salary trends. Eurostat has been providing average net salary data at the EU-28 level since 2023. To establish the historical trend from 2000 to 2022, the national currency (lei) was converted to EURO using the average annual exchange rate.

Figure 47 (A) visually illustrates that Romanian salaries exhibited consistent growth, averaging 7% from 2010 to 2022, surpassing the EU-28's 3% rate. This data emphasizes robust wage growth in Romania. In contrast, Figure 74 (B) provides a historical view of average monthly net salaries in Romania, comparing them to the EU-28 averages (available at Eurostat from 2013).

Romanian salaries displayed steady growth, with notable increases occurring from 2004 (when Romania joined NATO) to 2008 (during the Global Financial Crisis), and from 2015 to 2022, with a noticeable disruption in the pandemic year of 2021. However, European Union salaries consistently exceeded Romanian salaries, highlighting substantial disparities in recent years. Despite the growth, Romanian salaries remained below the EU-28 average, reaching half of the European average in 2022.

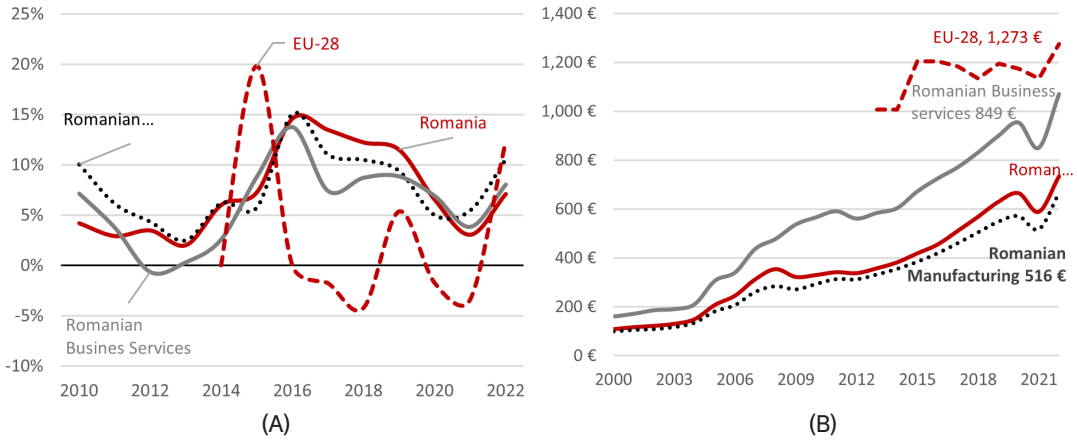
At the national level, the growth of the Romanian manufacturing sector consistently outperformed the business services sector, with an average annual change of 8% compared to 6%. Nonetheless, in absolute values, the Manufacturing sector experienced gradual salary increases but remained below the national average. In contrast, the Business Services sector consistently witnessed rising salaries, surpassing the national average on average

with 15%. The Business Services sector played a pivotal role in driving higher salaries, with a widening gap after the 2008 Global Financial Crisis.

Figure 47 (C) examines the annual percentage changes in average net salaries within the Manufacturing sector across various city-regions in Romania. Remarkably, Timișoara consistently reported the highest annual increases at 10%, surpassing the national average. During our interviews, an Operations Unit Manager at Flex emphasized that “wages have been steadily increasing since 2015. However, due to recent inflation, we [the union] requested a 15% salary increase, which the company couldn’t accommodate without affecting its operations” (Flex, Male, 50, Operations Unit Manager, Company).

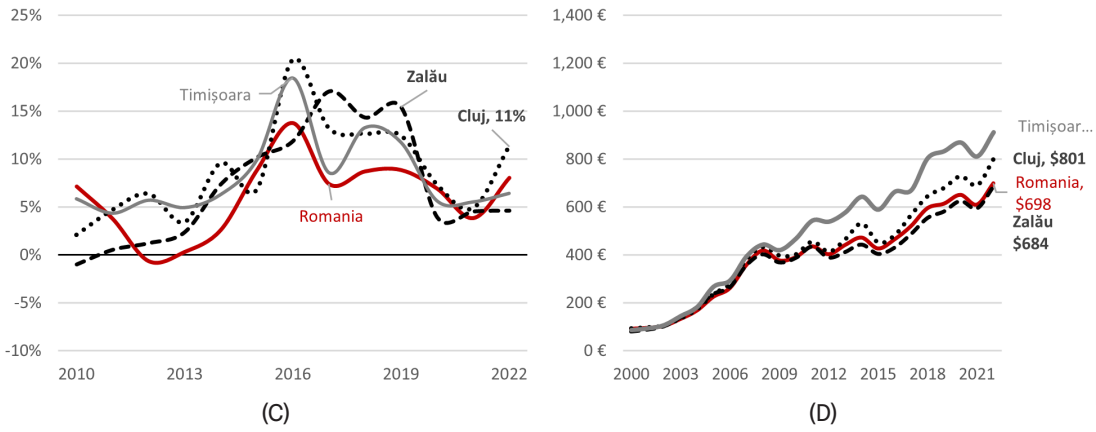
Fig. 54 —European vs. Romanian and Romanian sectorial annual changes in average net salary.

(A) Annual percent change 2010-2022*
(B) Annual values in Euro 2000-2022**



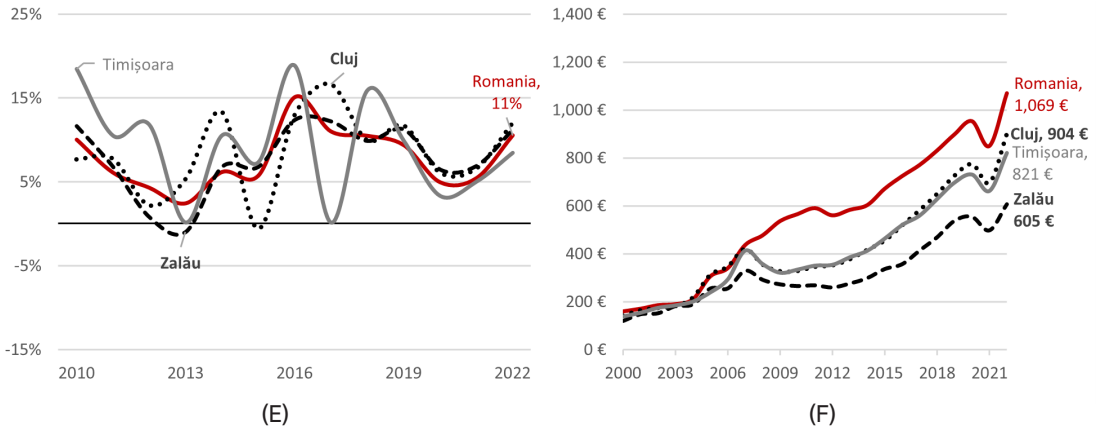
Annual changes in average net salary in the manufacturing sector by city-regions Cluj, Timișoara, Zalău, in Romania.

(C) Annual percent change 2010-2022*
(D) Annual values in Euro 2000-2022**



Annual changes in average net salary in the manufacturing sector by city-regions Cluj, Timișoara, Zalău, in Romania.

(E) Annual percent change 2010-2022*
(F) Annual values in Euro 2000-2022**



Nonetheless, by 2022 the salaries started to grow once again. In contrast, Zalău adhered to the national trend with an average change of 8%. This data underlines the positive salary growth in Romania's Manufacturing sector, with Cluj and Timișoara leading in annual increases, consistently outperforming the national average.

Figure 47 (D) provides a visualization of the average monthly net salaries in the Manufacturing sector across three city-regions in Romania from 2000 to 2022. Notable trends reveal continuous salary growth over the years, in particularly the growth after 2015 increase coinciding with the second wave of Western European outsourcing in Central and Eastern European (CEE) countries.

Timișoara consistently recorded the highest manufacturing sector salaries, while Zalău had the lowest. In 2022, average monthly salaries in the manufacturing sector were highest in Timișoara at €910.27, followed by Cluj at €800.77, and Zalău at €683.77. It is worth noting that the higher averages in Cluj and Timișoara can be attributed to the methodology used for calculating average salaries. As discussed below, the manufacturing sector in Cluj and Timișoara incorporates jobs in business services, including well-paid white-collar positions in engineering and ITC. This inclusion contributes to the elevation of the average net salary in these regions.

Figure 47 (E) displays the annual percentage change in average net salaries within the Business Services sector across various city-regions in Romania. While the national average annual change averaged 6% from 2010 to 2022, Cluj reported the highest average annual change at 9%, closely followed by Timișoara at 8%. Zalău, on the other hand, exhibited a slightly lower but still positive growth rate at 7%.

This data highlights the consistent salary increases within Romania's Business Services sector, with Cluj leading among the three city-regions in terms of annual growth rates. However, it's essential to note that Cluj was surpassed at the national level by the capital city, Bucharest, which hosts 40% of the business services workforce in Romania, compared to Cluj's 7%, Timișoara's 6%, and Zalău's mere 0.6%. This disparity explains why the national net salary exceeds that of Cluj.

Figure 47 (F) offers further insights into the Business Services sector by presenting the average monthly net salaries in this sector across different city-regions in Romania from 2000 to 2022. Notable trends include a steady increase in salaries over the years, with significant growth observed from 2004 to 2008, 2015 to 2020, and another substantial increase in 2022. Cluj consistently reported the highest salaries in the Business Services sector, followed by Timișoara. Zalău, despite starting at lower levels, showed substantial growth over time.

It's important to consider that the significant variations in salaries across city-regions underscore the growth of the Business Services sector in these regions within Romania. Regional differences in salary levels highlight the substantial impact of location on salaries within the Business Services sector,

with Cluj and Timișoara leading the way in terms of both growth and average salaries.

In summary, Romania has experienced consistent wage growth since 2010, surpassing the EU-28 rate. However, as of 2022, the country's average wages still only reach half of the European average. Significant disparities in wages persist across various sectors, with cities like Cluj-Napoca, Timișoara, and Bucharest witnessing substantial annual increases, while others like Zalău consistently lag behind the national average. Notably, the manufacturing sector has shown robust growth but offers lower net salaries compared to the business services sector, where salaries have consistently risen, influenced by geographical location.

Plant Labour Regimes

In this section, we delve into the landscape of labour regimes within the context of Romania's FDI-led growth, drawing insights from interviews conducted with workers, managers, and experts. We aim to elucidate how the coexistence of diverse labour regimes, rather than a simplistic dualism, characterizes the labour landscape in the regions of Cluj-Napoca, Timișoara, and Zalău. Our interviews challenge the conventional dual labour regime assumption, as the case studies showcase how employing different strategies produces favourable results in the long run.

Most blue-collar workers in the three factories brought with them previous employment experiences from neighbouring municipalities, forming a crucial backdrop against which their current FDI-manufacturing roles are evaluated. This constant comparison contributes to a consistent influx of labour from nearby towns and villages, reflecting the lure of these job opportunities. However, interviews conducted in all three cities shed light on the rigorous surveillance and control measures prevalent within multinational companies. These measures included persistent video surveillance, routine briefings, written reports, peer pressure to maintain productivity, and the unrelenting demands imposed by the conveyor line.

Firms tend to use coercive methods such as extensive surveillance of the employees during the work process. For example, a worker at Bosch in Cluj, aged 38, highlighted the omnipresent surveillance cameras, saying, "Yes, of course, we have cameras, at every corner, they're those 360-degree ones. It stresses me out that someone is watching me all the time. But what can you do, that's how it is in factories nowadays". While acknowledging that the cameras are present to track the workforce, there is also the possibility, expressed by the same respondent, that it might prevent theft.

On the other hand, discipline on the shopfloor is achieved by increasing the workload while operators are expected to act swiftly and not engage in interactions with other colleagues, as one interviewee claims: "When the workload is high, you must work quickly, and there are moments when we don't exchange a single word for hours. Can you imagine? It's intense" (Cluj, Bosch, M, 22 year old, operator). Although repetitive, some tasks require operators to be constantly on the move in order to maintain the production process, as one operator underlines: "In the initial assembly, where I work, I have more work than those in the final assembly because I have to move from one line to another, I'm constantly on my feet, and I end up walking quite a few kilometers a day" (Cluj Bosch, M, 22 years old, operator). Consequently, even if the standard operations are not always physically demanding, the expectation to be constantly on the move is reported as exhausting by some of the interviewees.

Alternatively, the workers in these three factories (Bosch, Flex, or Tenaris) perceived significantly less surveillance and control compared to their previous employment, largely attributable to their prior experiences of arbitrary

discipline in former roles within domestic capital-led companies. In exchange for their monthly compensation, they willingly embraced the company's regulations. As one 45-year-old line-setter from Flex, Timișoara, stated:

> "There are organizational things you must do. You should know that we have quite a few rules, but when you get used to them, it's fine, and you have to get used to them because we all need our salaries; it's part of your job (laughs). Where I worked before was terrible, which is why I left, even though it was closer to home" (Timișoara, Flex, M, 45 years old, line-setter).

Whereas the labour process includes numerous checks and surveillance systems, such as cameras and other digital technologies, the general narrative indicates that people adapt steadily to the situation. Another employee from Cluj-Napoca echoed this storyline, by giving the example of one of his actual colleagues:

> "A colleague of mine told me that at their previous job, they used to curse on their way to work, curse a couple more times during the day, and then come home all frustrated. But here, he said he comes in feeling relaxed" (Bosch, M, 23 years old, line-setter).

Besides constant surveillance, labour control was achieved via standardized production schemes and repetitive tasks. Although a clear hallmark of the despotic labour regimes, the occurrence of repetitive production schemes varies across the 3 companies, as well as inside the firm, between different hierarchies of professionalization. A 35-year-old operator from Bosch shared his experience in relation to the labour process:

> "Basically, I do the same thing every day, and I think I could do it with my eyes closed by now. To put it more simply, I look through a device with a pair of glasses for 8 hours, sometimes my gaze wanders, and it drives me crazy...".

Moreover, further standardization is accomplished by employing different production schemes, such as the KANBAN system, which the workers employ in their day-to-day jobs, while also being encouraged to discuss with their fellow colleagues about work done during the previous shift. Employees frequently experience the emergence of a daily routine within their professional responsibilities. This routine leads them to a state of automatism, where they execute their tasks almost unconsciously. As one respondent, G., a 22-year-old operator, humorously articulated:

> "Sometimes I feel like one of those robots from the movies, you know what I mean? (chuckles)" (Bosh, Cluj G., 22 years old, operator)

In contrast, Timișoara-based company Flex employs different production schemes, as they rely more on what a manager called "high mix, low volume" strategies. To be more precise, this strategy implies that a wider degree of flexibility is required, as there is a various catalogue of products which the plant produces, but there are fewer necessary products which need to be delivered constantly.

Therefore, workers are expected to develop more qualifications and be ready to move across different roles when called upon. As shared by someone in a managerial position, one operator has, in general, over 4 qualifications which can be employed in different production schemes. There are also cases of "low mix, high volume" products where operators are not required to develop more than 2 qualifications. A fundamental distinction is drawn between different levels of specialization, as professionals' benefit from a much higher degree of autonomy.

Apart from operators and some specific positions in production or testing, employees' working hours are hybrid, basically 2 days in the office and 3 days at home per week, but with a large degree of variation, depending on the specifics of the activities and personal preferences of the employees. The schedule includes various forms, such as remote and totally flexible, remote with a certain number of hours between 9-17 (office time), etc. Depending on the specifics of the activities, the more specialized and autonomous an employee becomes on the technical side, the more independent he or she becomes in organizing time. Conversely, the higher up the managerial ladder, the more dependent he or she becomes on office time in organizing work and interacting with other colleagues.

While a distinctive element of the despotic regime of labour organization, the constant threat of unemployment has not been underlined by the respondents. The agglomeration of firms within economic enclaves creates the necessity to employ different strategies for workforce recruitment, which do not always depend on increasing the wage level.

Businesses within the 3 localities manage to tap into large pools of labour resources due to the uneven development of regions, as the local workforce is not enough for the production capacities of these firms. Therefore, strategies include larger commutes, as in the case of Bosch plant in Jucu, where workers arrive from neighbouring counties of Mureș and Bistrița-Năsăud, but also relocation. The second phenomenon is rather common in the context of Flex, Timișoara, which manages to tap into labour resources from the Southern part of Romania, due to the relative lack of job opportunities within the area.

Despite the labour system displaying characteristic despotic features such as prolonged working hours, repetitive duties, physical exertion, and aspects of control reminiscent of a despotic employment structure, FDI-corporations actively endeavour to engage blue-collar employees through a more hegemonic strategy, fostering emotional ties to their job roles. The additional managerial strategies applied by these companies target engaging and integrating workers effectively into their respective work environments.

The practice of expressing gratitude at the end of each shift and recognizing employees' efforts plays a significant role in enhancing overall job satisfaction and fostering a sense of fulfilment. This emotional attachment to their work and the tangible feeling of being valued represent critical factors when discussing with the issues concerning labour motivation, job satisfaction, and the impact of labour regulations on their well-being. One Bosch interviewee, for instance, characterized the workplace as "very pleasant" and "relaxed",

emphasizing the sociable atmosphere among colleagues. The same person shared his experience of feeling appreciated for the work he is doing:

> "Personally, I feel appreciated. They thank me after every shift, saying, 'Thank you for your work, thank you for reaching your targets, have a good day.' I don't know how to put it, but I think this motivates me. I feel fulfilled that someone cares about the work I do."

Additionally, another interviewee highlighted the enthusiasm with which their colleagues approached their work and their versatile experiences across multiple assembly lines and roles, indicating a high degree of adaptability and job rotation within the workplace. This can be exemplified by the statement such as:

> "In the department where I work, which is the first assembly line, there are a lot of young people [like me], with an average age of around 25. Being all young, we have fun, laugh, and, of course, work well. But when there's not much work to do, which doesn't happen too often, you go and talk to your colleagues, have a laugh, exchange a few words – it's all good" (Timișoara Flex, M 22 ani, operator).

The overall narrative emphasizes upon the camaraderie feeling between the workers, but also in relation to some of their superiors. Respondents have indicated that the supervisors are expected to intervene and mediate when a possible conflict might arise between the workers. Besides the shopfloor interactions, there are various forms through which the workforce is integrated within the hegemonic discourse.

All three companies, in addition to the plants dedicated to manufacturing, house Shared Service Centres dedicated to providing specialized business services for their respective multinational owners.

In Timișoara, Flex operates an engineering design centre that serves the entire multinational corporation, functioning either independently or in collaboration with local production facilities. In the city of Cluj, Bosch's Engineering Centre specializes in Computer Vision and ITC research, while its factory is in the peri-urban area of Cluj (Jucu), situated 25 kilometres away.

Similarly, Tenaris maintains an operational support centre in Cluj city, positioned at a distance from the manufacturing outsourcing division in Zalău, approximately 95 kilometres away. This internal division of the companies, demarcating the manufacturing outsourcing division from the SCC in business services outsourcing, is intimately entwined with regional labour recruitment dynamics both for white-collar professionals and blue-collars.

Flex's offices and production site being situated in Timișoara, white-collar employees are primarily based in the city itself, with one-third internal migrants. Our interviews with managers in the business services sector provided us with valuable insights into the strategies employed by multinational corporations when recruiting white-collar workers.

Specifically, we had a conversation with a manager at Flex, who shared her perspective as an internal migrant and her experience of arriving as a student at the Technical University of Timișoara. She shed light on the significant number of engineers under her supervision who came from the southern regions of the country due to the limited employment opportunities available there. She expressed:

> "Well, you see, we are getting people from Timișoara, and there are also those who are uprooting themselves and moving here. I mean, they're coming from the southern areas where there's barely any industry or job opportunities left, and they're making the move to Timișoara to work. As for me, I originally came to Timișoara as a student from a southern town to study at the electrical engineering faculty" (Timișoara, Flex, F, 50, Operations Unit Manager)

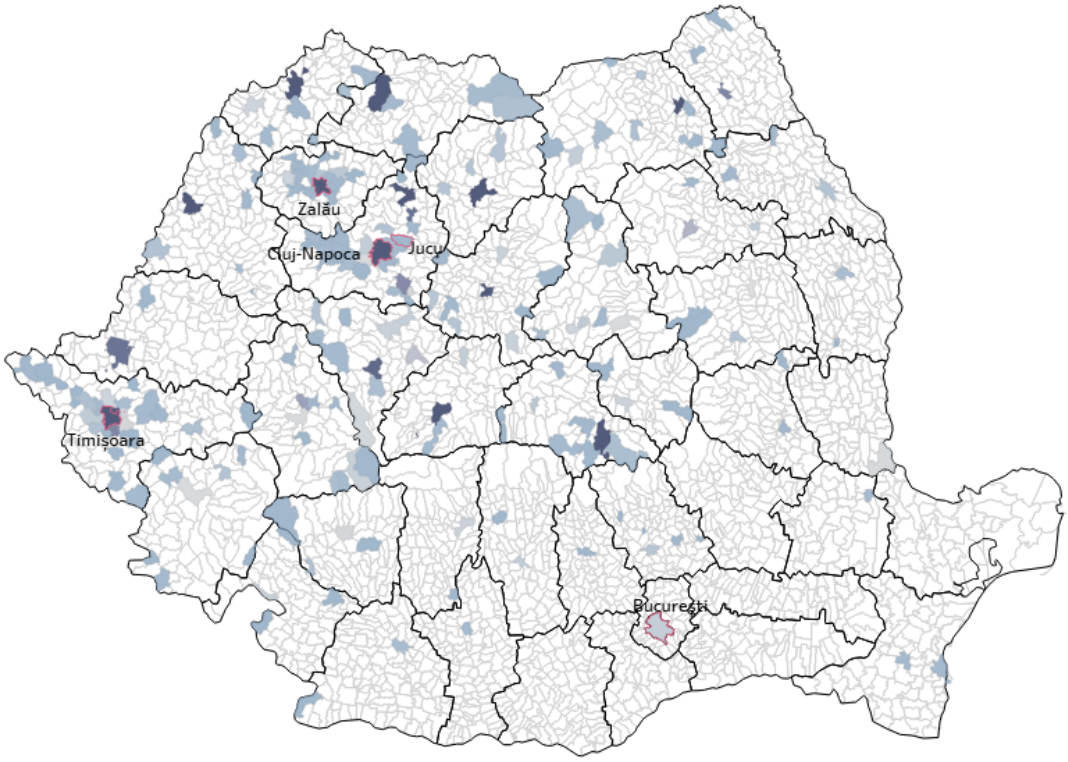
Company data, as illustrated in Figure 4(A), corroborate the fact that a substantial portion of migrant white-collar employees originate from regions characterized by declining industries and economic challenges.

This trend, which may extend beyond just the southern regions, highlights a significant pattern in internal migration. Many of these individuals have undertaken extensive journeys within the country (see Figure 4.A), ultimately choosing to settle in urban areas that offer more abundant opportunities within denser labour markets.

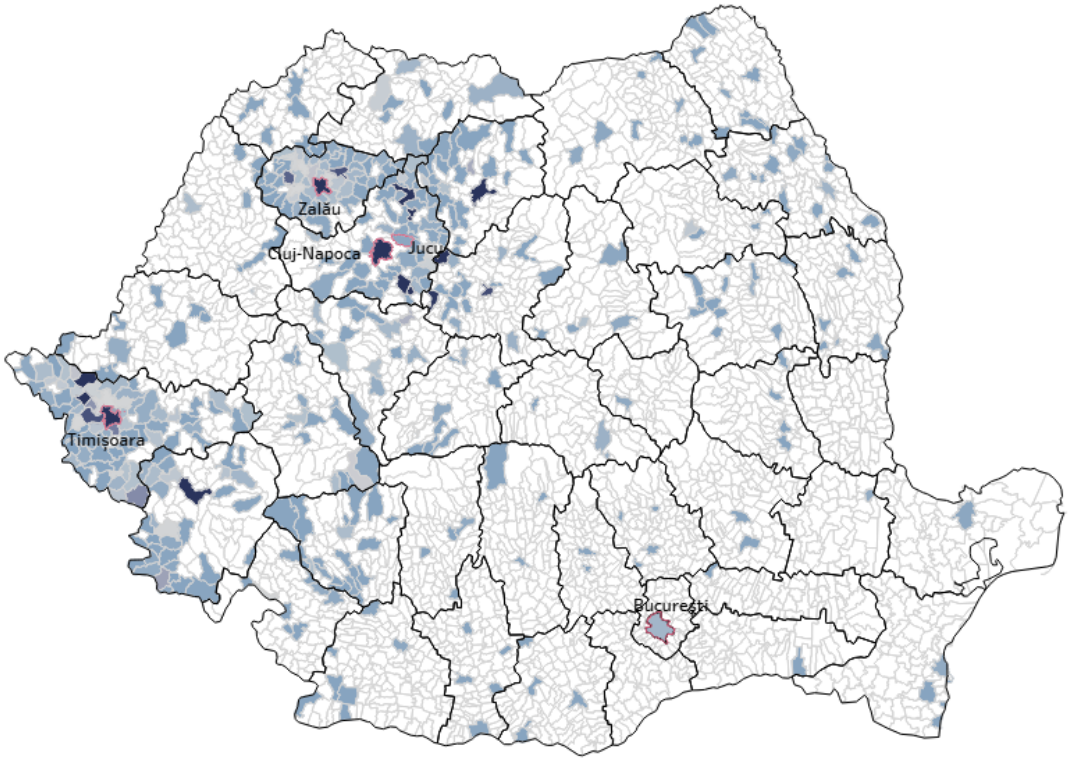
Each of these companies has strategically capitalized on this trend, often utilizing universities as crucial transit points for talent acquisition. These organizations have proactively initiated partnerships with local academic institutions and implemented specialized programs for students, with Bosch's 'working students' initiative serving as a noteworthy example.

Fig. 55 —Employee origins for three companies in the city-regions Cluj, Timișoara, Zalău, in Romania.

Data source: Based on companies records, Flextronic, Bosch Romania and Tenaris Silcotub.



(A) White-collars employee



(B) Blue-collars employees

This pronounced influx of white-collar workers from secondary towns across Romania to urban centres has sparked ongoing policy discussions at the administrative level, particularly in smaller towns that often face shortages of qualified human resources.

Attracting a substantial percentage of skilled migrants proves to be a formidable challenge. Zalău, where the Tenaris plant operates, is home to only four major employers and houses just three university branches with a relatively modest student population, two of which have their primary headquarters in Cluj. Consequently, relocating these specialized white-collar employees to Zalău would necessitate a complex urbanization process that would surpass the intended scope and available resources of the companies involved.

Conversely, Bosch and Tenaris employ distinctive recruitment strategies for their white-collar workforce, a divergence partly influenced by the geographical separation of their manufacturing sites and shared service centres.

As of the year 2023, Bosch's Engineering Centre stands as a testament with a workforce comprising 1,950 individuals, an impressive 81% of whom hold college degrees. This workforce is further enriched by an additional 13% who are concurrently pursuing their degrees while actively contributing to the company's operations.

An analogous scenario unfolds at Tenaris's Shared Service Centre in Cluj, where a remarkable 95% of the employees boast college degrees. It is noteworthy that in both Shared Service Centres located in Cluj, roughly two-thirds of the white-collar employees are internal migrants.

The predominance of internal migrants in Cluj can be attributed to the broader spectrum of business services offered in this city, a distinction from the specialized focus of the engineering Shared Service centre in Timișoara. For example, the Tenaris Shared Service Centre in Cluj employs a more extensive array of skills tailored to a larger potential talent pool. This specialization extends to areas such as human resources and logistics management, widening the scope of available recruits and enhancing the versatility of the workforce.

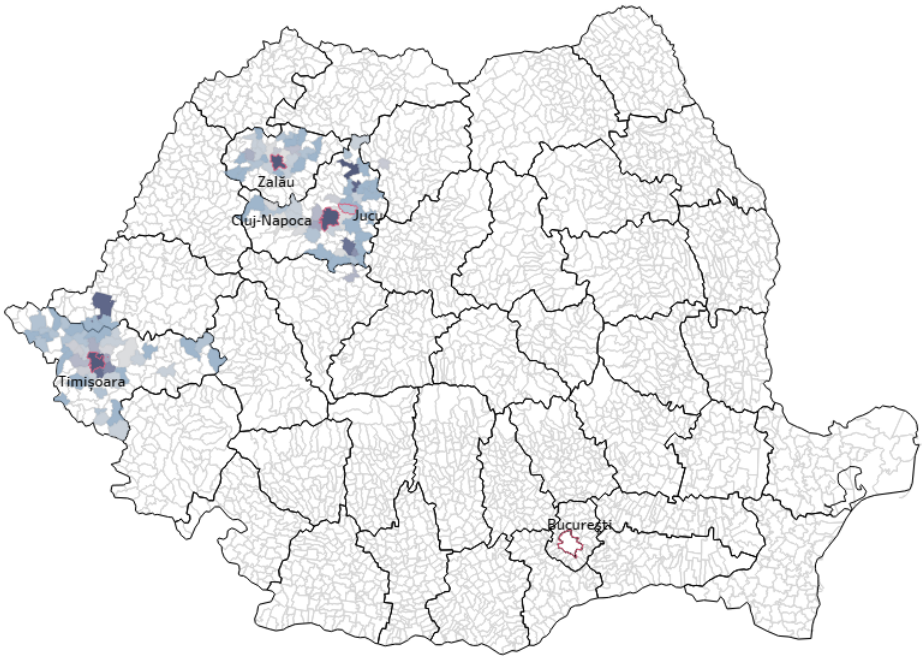
> "In terms of my education, I had completed a degree in Automotive Engineering, and I was really into everything related to cars, transportation, and such. So, I thought it would be a great opportunity for me to start in the automotive sector. Consequently, I began my career at Autoliv in Reșița, initially working on safety systems, and later, I moved to Continental in Timișoara, where I started dealing with components and dashboards. I decided to move here, to a bigger city, for more opportunities and development. I'm always on the lookout for personal growth. And here, I discovered that being in a larger city automatically doubled my chances for development. And finally, I'm working here, for two years now, at Flex.". (Timișoara, Flex, M, 33, warehouse trainer)

The professional in the above quotation, currently based in Timișoara, explains how he skilfully navigates the automotive industry. He describes his journey

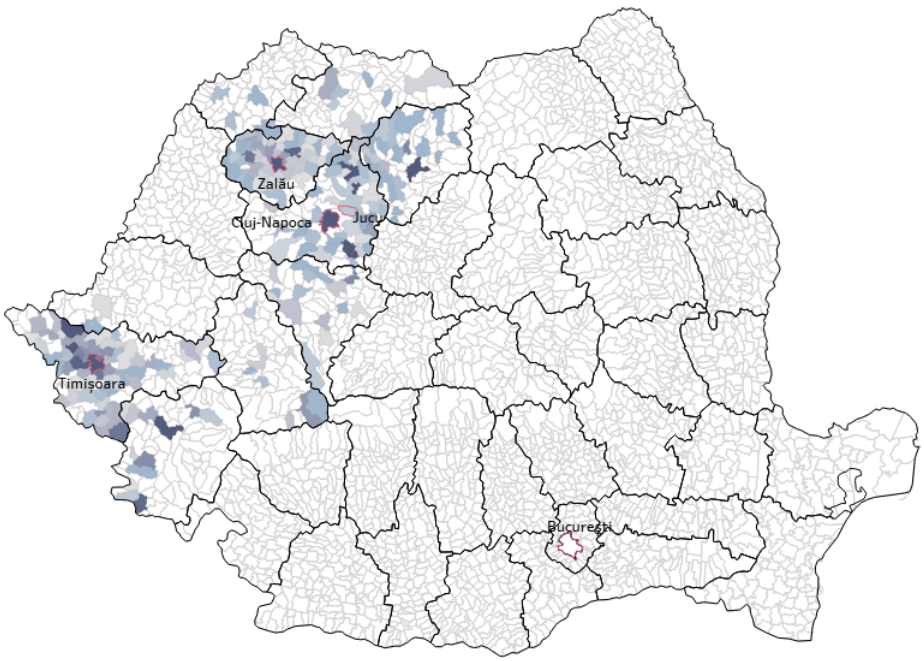
across various cities and companies in pursuit of expertise and opportunities within the sector.

This career path is characterized by the transfer of tacit knowledge and the development of skills within and between different roles, enabling him, as an engineer, to achieve a deeper specialization within the sector. Additionally, a Flex manager emphasized the need to move beyond traditional agglomeration economies to attract skilled labor. This entails offering urban amenities and cultural attractions to entice potential employees, mirroring Cluj City's investment in enhancing its appeal and competitiveness.

Fig. 55 —Employee origins for three companies in the city-regions Cluj, Timișoara, Zalău, in Romania.



(A) White-collars employee



(B) Blue-collars employees

> Look at Cluj for example, Cluj is in the same situation like Timișoara, also a lot of industry have settled there, but Cluj was more capable to reconstruct the city. There was much more renovation going on, much more infrastructure, and that is bringing much more quality to the inhabitants of the city. And here, Timișoara lost a little bit track in the last ten years. So at the same time industries settled here creating workplaces, a lot of jobs, bringing income from taxes, social contributions, whatsoever, Timișoara was not capable to immediately use that as an advantage also to renovate and to make it more attractive, so that people working here will finally settle also. (Timișoara, Azur, M, 45, general manager)

The strategy of consolidating employees with college degrees into a shared labour pool that fuels entire city-region industry has emerged as a pivotal approach in minimizing urbanization costs while still attracting a qualified labour force. While a higher concentration of qualified employees in a specific location may exert upward pressure on salaries and create inflationary pressures within the local housing market, it remains a cost-effective alternative compared to the comprehensive expenses associated with full-fledged urbanization.

All managers expressed concerns about the increasing difficulty of recruiting blue-collar workers. They noted that younger generations desire more flexible working hours, which is challenging to accommodate for operators. To address this issue, they experimented with hiring individuals from South Asia for the sections that require less experience and skill. However, this approach necessitated various forms of urbanization for the foreign blue-collar workers, including renting flats or providing cooking services, that ultimately is more expensive as the rentals are quite limited. To scale up such a strategy would necessitate to invest in new accommodation.

Managers remain vigilant regarding the seasonal labour shift, a phenomenon where many Romanians seek agri-work abroad during the summer and return in the autumn, a strategy discussed in previous research (Ban, 2021). To adapt to this fluctuation, all three companies have classified workers as either active or inactive, to streamline re-employment in autome. The trend of Romanians working abroad exerts substantial pressure to provide competitive wages and benefits for blue-collar workers. While the thriving FDI-industry in Romania drives wage growth as the need for employee grow, the presence of Western European employers intensifies this pressure, bypassing temptation of monopolistic informal agreemets. Consequently, companies offer various incentives, including rent subsidies, gas allowances for commuters, and dedicated bus fleets for employee transportation.

Managers have increasingly turned their attention to recruiting from nearby villages and towns, both directly and indirectly through vocational schools. Capitalizing on EU grant schemes, all three cities have invested in dual education programs, providing factory training for students while they study. An interviewee's experience, near Zalău, underscores the appealing employment opportunities offered by nearby villages. Many young individuals in search of improved financial prospects and stability find pressure for short internal migration compelling. In this case, the interviewee initially contemplated

working abroad but was swayed by a teacher's suggestion from their vocational school to explore opportunities at Tenaris in Zalău. This choice not only provided stability and the advantages of international company employment but also allowed the interviewee to remain close to their family and hometown in Jibou, highlighting the allure of local employment options.

> "I used to live in Jibou, and my parents are from there too. I went to school in Jibou, focused on technical studies. Initially, like any young person, I had thoughts of going abroad because, like most young folks, I needed to make some money. Then, with the help of one of my teachers, they suggested, 'Why not give Tenaris a shot?' That was about nine years ago. I thought, 'Why not? Let's give it a try.' When I shared this idea with my parents, they were quite pleased, even though it wasn't a formal job offer; it was just advice from a teacher. They said, 'Go ahead, give it a try. Tenaris is different; it's an international company, not some small firm. You'll have stability.' So, I thought, 'Let's give it a shot!' I actually ranked fourth nationally in the electrical field during the electrical Olympiad, which turned out to be an advantage when I submitted my CV. And since then, for the past nine years, I've been with Tenaris." (S.V., 27, male, electrical maintenance leader, rural, Tenaris)

The presence of FDI-companies has had a notable impact on the local labour market, particularly in terms of wages. As exemplified by the interviewee below, who transitioned from a minimum-wage job in roofing systems to a position as an electrician at Tenaris, FDI companies often offer more attractive financial prospects. This shift can create upward pressure on wages within the local market, as other employers may need to increase salaries to remain competitive and retain talent. Additionally, the learning opportunities and skill development provided by FDI companies like Tenaris can further elevate the skills and employability of the local workforce, contributing to broader economic growth and job market dynamics.

> "I started this job about a year ago, maybe a year and a month. I actually found it online, and I decided to give it a shot because it's a big change in life, mainly a new profession. You see, you learn a trade that sticks with you, and there's the financial aspect as well. Before this, I was working in roofing systems as a sales agent, but after a while, sales were really slow, I mean, they were barely moving. You can't stick around for long when you're earning minimum wage. So, I started looking for other job opportunities and came across Tenaris, a position as an electrician. I had some experience in the field before, but nothing quite like what it's been here. The experience here has been amazing, really something out of the ordinary. I've evolved quite a bit since I started because, of course, I came in with the eagerness to learn the trade. I genuinely enjoy it, and slowly but surely, each person here explained things to me, like how this works, how that works, they taught me about mechanisms, and some aspects of automation... It's been a gradual process, and of course, there's still a lot more to learn." (D.A., 24, male, electrician, rural, Tenaris)

Nevertheless, a manager from Flex emphasized that blue-collar workers moving between companies is relatively rare. He highlighted, "in Timișoara,

particularly in the electronics sector, numerous companies understand the importance of offering competitive salary packages and benefits for both workers and engineers. When the differences in compensation between companies are minimal, there is little incentive for workers to switch jobs". Several managers from Timișoara reported that that they engage in informal discussions to establish wage agreements. This practice is reinforced by HR requirements and professional networks that span industries, ensuring synchronization in wage standards. Therefore, alongside unionized wage consensus, inter-managerial consensus-building mechanisms for wage regulation exist. Consequently, blue-collar workers reported having sufficient resources to meet their needs. One worker stated,

> "I've never found myself in a situation where I run out of money before the next payday. My wife and I can save around 100 euros every month. This is partly because we live in an apartment and because we spend weekends and some vacation days at my parents' place in the countryside, where we help them out. This way, we have a supply of meat, eggs, and vegetables from the countryside, so we don't need to buy any of these" (Flex, Maintenance Mechanic, Male, 50).

The interviews also shed light on inter-institutional collaborations that play a pivotal role in shaping the economic landscape. A notable case is the national project known as IPCEI Microelectronics, initiated by Continental in collaboration with the Romanian Academy, Bosch, Infineon, Politehnica University of Bucharest, and Timișoara.

This consortium represents a collaborative effort to outline a national agenda for Romania's future in microelectronics. Through partnerships between companies, universities, small and medium-sized enterprises (SMEs), and governmental bodies, the project aligns with the goals of the National Recovery and Resilience Plan (PNRR). It exemplifies how collaborative ventures can mobilize resources and expertise to drive economic development in specific sectors.

> And now, what really needs to be done here in Timișoara is to raise the quality of life here. Not necessary salaries, other personal benefits obtained from business or from salaries, but to renovate Timișoara. Look at Cluj for example, Cluj is in the same situation like Timișoara, also a lot of industry have settled there, but Cluj was more capable to reconstruct the city. There was much more renovation going on, much more infrastructure, and that is bringing much more quality to the inhabitants of the city. And here, Timișoara lost a little bit track in the last ten years. So at the same time industries settled here creating workplaces, a lot of jobs, bringing income from taxes, social contributions, whatsoever, Timișoara was not capable to immediately use that as an advantage also to renovate and to make it more attractive, so that people working here will finally settle also. (Timișoara, Azur, M, 45, general manager)

The project's significance extends to the European level, as it aligns with the European IPCEI Microelectronics initiative, a multi-state program aimed at enhancing execution capabilities and the value chain in European microelectronics. Romania's participation in this initiative, backed by a comprehensive national partnership, underscores the country's commitment to innovation and economic growth on a broader scale.

> The best example is the national project called IPCEI Microelectronics, initiated by Continental in collaboration with the Romanian Academy. Bosch, Infineon, Politehnica University of Bucharest, and Timișoara have also joined in. It's now become this massive consortium. Together, we've practically outlined the national agenda for what should happen in Romania over the next few years using the funds from the National Recovery and Resilience Plan (PNRR) in the field of enhancing execution capabilities and the value chain in European microelectronics. What are we doing in Romania? What are we educating? What production lines are we setting up? In which directions are we heading with them? All of these have gone into a sort of project proposal, but on the next level. It's practically a national project, backed up by the Ministry of European Funds, and I believe the Ministry of Economy, in front of Brussels. Essentially, Romania went to Brussels with a project written by a fairly extensive national partnership, including companies operating in Romania, universities, small and medium-sized enterprises (SMEs), corporations, and so on, to become part of the European IPCEI Microelectronics initiative. At the European level, it's a multi-state program where each state had the option to say yes, I want to be in this program, and if I want to be in this program, then I have to provide all the details about what I want to do, how I'm going to do it, how I align with other states to avoid competing with them, and so on.

Additionally, the interviews reveal the importance of collaborations on legislative matters. Professional associations like ACAROM, which represents car manufacturers and sellers, serve as platforms for alignment on legislative changes. An illustrative case is the need to update legislation related to the testing of modified cars on public roads. The existing legislation, dating back to the 1980s, is outdated and fails to address the complexities of the modern automotive industry. Collaboration within associations like ACAROM enables industry players to advocate for legislative reforms and address regulatory challenges collectively.

One of the specific issues discussed is the absence of a CAEN code for car manufacturers in Romania, which complicates the process of conducting tests with components on public roads. The interviews highlight the contrast between Romania and countries like Germany, where such testing is more streamlined. This underscores the importance of aligning legislative frameworks with industry needs to facilitate growth and innovation.

> There are also specific collaborations on legislative matters. For example, through professional associations like ACAROM, the association of car manufacturers and sellers... There, for instance, we align ourselves with ACAROM members if we want to initiate a legislative change. For example, one of the issues that concerns us greatly is the testing of modified cars on public roads. The legislation was designed back in the '80s when in Romania, only Dacia Pitești had anything to do with cars. They established it... We haven't had a serious update to the legislation on road testing since then. We don't have a CAEN code for car manufacturers; instead, we have one for car component manufacturers, but it's our responsibility to perform all tests with the components on public roads. Sometimes, it's quite a hassle in Romania to get your car out on public roads for testing, whereas in Germany, it's no problem at all... We have to be even more thorough than necessary because sometimes the Ministry of Interior is more critical than the Ministry of Economy.

While industrial development has been a driving force, there is a growing recognition in Timișoara of the need to enhance the city's quality of life through urban revitalization and branding for the new wave of white-collars. Cluj serves as an inspiring example of successful urban transformation in the face of industrial expansion. Moreover, collaborative projects like IPCEI Microelectronics demonstrate the power of partnerships between companies, universities, and government bodies in shaping the economic future of a region. These initiatives not only contribute to sector-specific growth but also align with broader national and European agendas.

These institutional processes are ways to manage within the contained space of the city-region the effects of the recruitment processes: a high pressure on nearby villages, transforming them into primary sources of labour for short internal migration and relocation within the vicinity of major industrial plants in the cities. Although long internal migration remains prevalent, a trend more commonly associated with white-collar workers, the majority of blue-collar relocations stem from adjacent rural areas and towns, aiming for closer proximity to these plants. The industrial tradition plays a pivotal role, evident in the higher concentration of blue-collar residents in Timișoara and Zalău, while in Cluj, only a smaller portion of blue-collar workers reside within the city limits.

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