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Regional Science Inquiry, Vol. XVI, (2), 2024
Editorial Note

In the second semester of 2024, the Regional Science Inquiry Journal (RSIJ), the scientific journal published under the aegis of the Hellenic Association of Regional Scientists, launches the second issue (2) of its sixteenth volume (Vol. XVI) since the first day it was published.

RSIJ is an international, open-access, peer-reviewed journal that publishes research across the broad and multidisciplinary field of Regional Science. The journal's mission is to freely promote global academic dialogue in Regional Science, supporting scientific inquiry and advancing empirical, methodological, and theoretical contributions of high quality. RSIJ serves as a platform for scholars, researchers, policymakers, and practitioners to share insights on regional development and its diverse dimensions.

This semester's issue (RSIJ, Vol. XVI, (2), 2024) presents ten papers carefully selected to meet the journal's high standards. These papers cover contemporary topics in Regional Science, including specialization, deindustrialization, and production technology (Delgado and Sequeira, 2024; Uzsayilir and Baycan, 2024; Shala and Hoxha, 2024); convergence in educational inequality (Adamakou and Kallioras, 2024); organizational culture in healthcare (Corvo et al., 2024); tourism development (Jablanovic, 2024); the relationship between policy and spatial inequalities (Constantin and Volintiru, 2024); and the challenges of AI in the regional economy (Todri and Papajorgji, 2024). This issue enhances academic discourse by engaging with critical aspects of regional science inquiry, such as spatial inequalities (Polyzos, 2019; Tsiotas and Tselios, 2024) and the enduring regional problem (Geppert & Stephan, 2008; Goecke & Huther, 2016). These topics remain a priority on the regional development and policy agenda (Capello, 2016; Polyzos, 2019, 2023; Fratesi et al., 2024), with relevant discussions featured in this edition. Additionally, in innovation-based (Todtling & Trippl, 2005; Veugelers et al., 2015; Cappelli & Montobbio, 2016), technology-based (Trippl et al., 2018; Tsiotas & Polyzos, 2021), and production-based (Pnevmatikos et al., 2019) aspects of regional economic development, the RSIJ reader can also find a relevant discussion in this RSIJ issue.

In brief, the *first* paper, titled "*PRODUCTIVE SPECIALIZATION AND CLUSTERS IN THE AGRI-FOOD SYSTEM OF NORTHERN PORTUGAL*", authored by Ana Paula DELGADO and Teresa SEQUEIRA examines the agri-food industry profile in the Região Norte of Portugal. This region, with a historically significant primary sector, faces challenges in economic and social cohesion. Using indicators of employment, GVA, and sales, the paper analyzes location and specialization metrics, identifying clusters that outline productive areas. The findings contribute to defining effective policy instruments for regional development.

The *second* paper, titled "*DETECTING FOR CONVERGENCE TRENDS AMONG CHINESE UNIVERSITIES IN TERMS OF ACADEMIC PERFORMANCE*", authored by Maria ADAMAKOU and Dimitris KALLIORAS, explores convergence trends among Chinese universities as growth determinants within the knowledge economy. The study uses data from the URAP database (2018/19–2022/23) and a gaps convergence club approach, concluding that Chinese universities exhibit incremental convergence, a process influenced by policy. The findings underscore the importance of addressing institutional disparities in Chinese educational development.

The *third* paper, titled "*REGIONAL SPECIALIZATION IN THE CONTEXT OF DEINDUSTRIALIZATION: THE CASE OF TÜRKİYE*, authored by Aysu UZSAYILIR and Tüzin BAYCAN, investigates deindustrialization at the regional level in Türkiye's NUTS 2 regions through a long-term Location Quotient analysis. Results reveal that Türkiye, traditionally an agricultural society undergoing industrialization, shows patterns of deindustrialization, especially in the Northwest industrial cluster centered in Istanbul.

The *fourth* paper, titled "*PLACE-BASED POLICY RESPONSES TO SPATIAL INEQUALITIES*", authored by Daniela- Luminița CONSTANTIN and Clara-Alexandra VOLINTIRU, reviews recent literature on spatial inequalities, emphasizing the challenges of "left-behind places" and the "geography of discontent". The paper advocates place-based policy solutions that harness the untapped potential of weaker regions, aligning with the future directions of Cohesion Policy and the European growth model.

The *fifth* paper, titled "*ARTIFICIAL INTELLIGENCE WAVES IN FINANCIAL SERVICES INDUSTRY: AN EVOLUTION FACTORIAL ANALYSIS*", authored by Ardita TODRI and Petraq PAPAJORGJI, explores the evolution of AI in financial services based on a survey of 523 professionals. The study argues for regulatory frameworks that balance risk management with innovation, providing recommendations for academia and industry professionals to foster sustainable AI evolution in finance.

The *sixth* paper, titled "*THE IMPACT OF THE FOOD PRODUCTION PROCESS IN THE PEJA REGION OF KOSOVO: THE CASE OF PI&KI BISCUITS OF EGI GROUP*", authored by Nexhdet SHALA and Ibrahim HOXHA, focuses on the production technology of tea cakes in Kosovo's Peja region. By delving to the production technology in the tea cakes industry in the Peja region of Kosovo,

this research can be seen as a case of production-based and innovation-based development in a local agri-food sector.

The *seventh* paper, titled "*THE IMPORTANCE OF ORGANIZATIONAL CULTURE IN THE PERFORMANCE OF FAMILY HEALTH UNITS – MODEL B IN THE ALGARVE REGION*", authored by Teresa CORVO, Susana PESCADA, Armand KRASNIQI, Joao VIDAL, Fernando TEIXEIRA, and Filipos RUXHO, examines how a Clan-type organizational culture, characterized by loyalty and tradition, enhances performance in Algarve's Family Health Units. The study highlights teamwork, people-centered practices, and project-oriented leadership as key elements of this cultural model.

The *eighth* paper, titled "*TOURISM AND THE CHAOTIC ECONOMIC GROWTH MODEL: THE ASEAN COUNTRIES*", authored by Vesna JABLANOVIC, uses chaos theory to assess the stability of tourism's contribution to GDP growth in ASEAN countries (Brunel Darussalam, Indonesia, Malaysia, Vietnam, Thailand, and Philippines) from 2010–2019, excluding four cases due to data availability. The confirm growth stability of the tourism total contribution to GDP in the observed countries in the observed period.

The *ninth* paper, titled "*THE IMPLEMENTATION OF SOCIAL PROTECTION POLICIES AT LOCAL LEVEL ACCORDING TO INCLUSIVE AND SUSTAINABLE DEVELOPMENT*", authored by Anastasios SEPETIS, evaluates regional and local roles in social protection policy within the context of inclusive and sustainable development. The study emphasizes the need for harmonizing principles of social protection at the regional and local levels to achieve sustainable development goals.

Last but not least, the *tenth* paper, titled "*MAPPING THE PSYCHOLOGICAL LANDSCAPE OF SOCIAL PREFERENCES AND ATTITUDES TOWARDS VOLUNTARY INSURANCE PRODUCTS IN THE WESTERN BALKAN REGION*", authored by Ardita TODRI, Imelda SEJDINI, Petraq PAPAJORGJI, and Christos Ap. LADIAS, investigates the factors affecting demand for voluntary life and non-life insurance in the Western Balkan region, focusing on age and gender preferences, suggesting that financial institutions should tailor their awareness strategies to these preferences.

All these interesting works are available on the next pages of the RSIJ intending to promote the academic dialogue in Regional Science. Overall, the Editor in Chief, Prof. Christos Ap. Ladias, the Editorial Board, and the signatory of this Editorial Note welcome the reader to the multidisciplinary journey of Regional Science Inquiry that the current issue promises on its following pages.

On behalf of the Editor-in-Chief and Editorial Board,
Dimitrios Tsiotas, Ph.D.,
Assistant Professor – RSI J.

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Articles

PRODUCTIVE SPECIALIZATION AND CLUSTERS IN THE AGRI-FOOD SYSTEM OF NORTHERN PORTUGAL

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Abstract

The Região Norte of Portugal is a region where the primary sector has historically played a significant role. It is generally an aging region, with a large area considered as low-density and with a low level of purchasing power, revealing deep asymmetries in terms of economic and social cohesion. This study aims to analyse the profile of the agri-food industry, that is, the food and beverage industries, in the north of Portugal in terms of productive specialization. This work started by collecting a set of variables such as employment, people employed, GVA and value of sales and services provided, depending on the level of disaggregation of the classification of economic activities and the availability of data. Based on this statistical data, location and specialization indicators were calculated, namely the location quotient. Then, using statistical software, clusters were built that enabled us to draw a picture of the agri-food system. This work was relevant to identifying the relative specialization of Norte NUTs III regions, the relative location of activities and the outlining of productive areas. It is expected that it will contribute to the definition of effective policy instruments to be developed in the region by the responsible organisation for regional development, based on the region's profile and with the aim of an intelligent specialization strategy.

Keywords: productive specialization, clusters, regional development
JEL classification: R12; R58

Acknowledgments: This article was initially developed as a contribution by the authors to a broader study on the agri-food industry in the Northern Region, coordinated by Fernandes, F. and Batista, A. (2023), Ecossistema Alimentar, Gestão Ativa do Território e Desenvolvimento Regional. Comissão de Coordenação Região Norte.

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1. Introduction

Portugal's Common Agricultural Policy Strategic Plan (PEPAC) follows the general guidelines of European policy, namely the 'Farm to Fork' Strategy, which is part of the European Green Deal and aims to accelerate the EU's transition to a sustainable food system (European Commission, 2020). This means, according to Fernandes, F. and Baptista, A. (2023), that it must have a neutral or positive environmental impact; contribute to mitigating climate change and adapting to its impacts; reverse the loss of biodiversity; guarantee food safety, nutrition and public health, ensuring that everyone has access to sufficient, nutritious and sustainable food; and preserve the affordability of food, while also generating fairer economic returns, fostering the competitiveness of the EU supply sector and promoting fair trade. It must also comply with a set of national guidelines, with the core element of the vision being 'Enabling active land management based on innovative and sustainable agricultural and forestry production'.

The agri-food sector, which is a crucial sector for the economy, as it covers a wide-ranging and diversified activities that involve various stages of the food production chain, from agricultural production to distribution and sales to the end consumer. It is therefore vital for feeding the population, but also for the global economy, being responsible for generating jobs, promoting rural development and contributing to international trade. However, the agri-

food sector face multiple challenges, both on a local scale (in the case of the infrastructure inherent in the entire value chain; access to technology, financing issues, regulations and climate change) and on a global scale (which adds to the challenges mentioned on a local scale, issues such as food safety, environmental sustainability, distribution and logistics, international trade constraints which include competitiveness and issues linked to inequality and social inclusion).

For Região Norte, a developing region covered by the convergence objective in the European Union's cohesion policy, the challenges in terms of competitiveness on a global scale, as well as in terms of combating inequality and social inclusion associated with small producers and rural communities, are unavoidable issues. In this context, knowing the production profile of its NUTs III regions, the location of production activities and regional specialisation is crucial to meeting the challenges of the agri-food industry. This detailed understanding can bring several benefits and help develop effective strategies to overcome the obstacles faced by the sector. Thus, this work will focus on studying the production profile of the agri-food sector in the Região Norte. After a brief characterisation of the region, we present the objectives, conceptual framework and methodology of the study. In the next point, we analyse the location of the agri-food sector and regional specialisation at NUT III level for Região Norte. Afterwards we perform a cluster analysis in order to identify relevant spatial agglomeration of agri-food activities. Finally, we discuss the main results and present some conclusions in terms of the relevance of the study's results to the smart specialisation strategy of Região Norte.

2. Objectives and methodology

In this study we analyse the profile of the agri-food sector in the north of Portugal (Região Norte), identifying the relative specialisation of Norte's NUTs III regions, the relative location of agri-food activities and the outlining of productive areas.

In order to characterize the specialization profile of Região Norte and its subregions we used standard specialization indices measuring the extent to which activities are concentrated or dispersed across a given space. These indices make it possible to evaluate the specialization profile and the degree of specialization/diversification of a region, considering a given sectoral distribution of the retained variable (usually employment or Gross value added (GVA)) and the characteristics of the reference space, usually the national economy.

The location quotient (QLik), as a measure of relative specialization, compares the relative contribution of a sector (k) to a given region (i) with the share of the same sector to the reference space (Delgado and Godinho, 2011). It is given by the following formula:

$$QL_{ik} = \frac{\frac{X_{ik}}{X_i}}{\frac{X_k}{X}}, 0 \leq QL_{ik} \leq +\infty \qquad (1)$$

If the variable is employment, for region i, then Xik is regional employment in sector k, Xi is total regional employment, Xk is total employment in sector k for the reference space and X is total employment in the reference space.

Location quotient values greater than unity indicate that sector k has a relative contribution to the variable, in the region, greater than that in the reference space. In this sense, it can be said that region i is specialized in sector k in relation to the reference space. In the case QLik<1 the region is not relatively specialised in sector k.

It should be noted that the location quotient may also be used as an index of relative concentration of a given activity across a set of regions. In this case a location quotient greater than 1 means that the variable (employment, for instance) in a given sector (k) is concentrated, in relative terms, in an individual region (i).

There is a consensus that the development of regional specialisation and location of productive activities indicators make an important contribution to understanding the productive profile of a territory and, consequently, to outlining development policies.

The application of this methodology has yielded good results in various published works, which vary both in their territorial scope, with the possibility of using a more or less micro scale, and in the level of disaggregation of economic activities. The degree of disaggregation depends not only on the purpose of the work but also on the availability of statistical data, which sometimes becomes a major obstacle.

As examples, we can mention studies that seek to analyse all the regions of a country and all economic activities - such as Sequeira 2024; Keogan, Calá and Belmartino, 2020; Diniz and Carvalho, 2015. Another type of application of this methodology are works very focused on specific sectors, such as Fernandes and Baptista, 2023, Parré and Chagas, 2023 , Pacheco-Almaraz et al, 2021, all in the agri-food sector, or Martínez, Navarro and Garnica, 2017, in the automotive sector, or even in specific regions such as Abrita et al., 2023, in the municipalities of Mato Grosso, Brasil, Flores-Cevallos et al., 2023, in the province of Cotopaxi, Ecuador, or CCDRC, 2020, about Região Centro of Portugal.

With regard to the methodology used to analyse the identification of clusters, i.e. homogeneous groups in the data, a multivariate statistical process will be used. The only variable for which information is available at county level and for the subclasses of the classification of economic activities (CAE) is the "number of establishments" (INE, 2023a), therefore this will be the variable used for the clustering process. This method seeks to group individuals, in this case municipalities, according to existing information, so that the individuals in a group are as similar to each other as possible, and as different from the other groups as possible.

Consequently, in methodological terms and in accordance with the usual procedures recommended by various authors (Marôco, 2021; Pestana and Gageiro, 2014), we first applyed the IBM SPSS software (version 27) to use hierarchical grouping methods (grouping based on distance, including the average distance between clusters method). These made it possible to analyse and compare the various possible solutions and the number of clusters to be selected. This was followed by the use of a non-hierarchical method (k-means) as a strategy to confirm the results obtained. The number of clusters to be selected was estimated by applying the distance between clusters criterion, analysing dendograms and the R2 criterion.

3. Data

We collected a set of variables such as employment, people employed, GVA and turnover, depending on the level of disaggregation of the classification of economic activities and the availability of data.

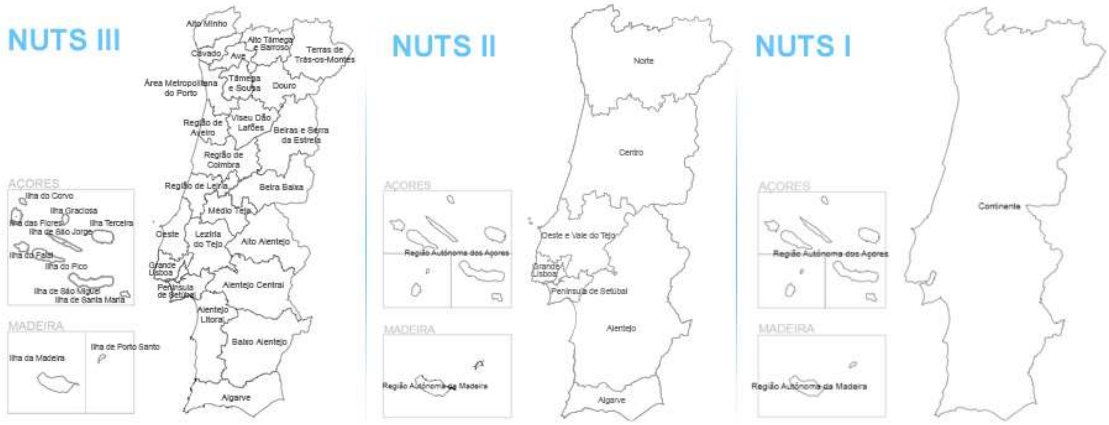
Based on this statistical data, location and specialization indicators were calculated, namely the location quotient, the specialization coefficient and the entropy index. For relative specialization indices (location quotient and specialization coefficient) we took the distribution of the variables in the country as reference. We used Statistics Portugal, Integrated Business Accounts System (INE, 2023b), which includes all enterprises from sections A to S of Portuguese Classification of Economic Activities, revision 3 (CAE Rev. 3), with the exception of section K (Financial and Insurance Activities) and section O (Public Administration and Defense; Compulsory Social Security.

To study the relative location of agricultural and animal production activities as well as some food and beverages sectors, at 4 and 5 digit level of CAE Rev. 3, we used information on the Central Balance-Sheet published by Banco de Portugal, which allows sectoral analysis of nonfinancial corporations, comprising data on the number of enterprises, number of employees and turnover.

4. Brief characterisation of the Region

In terms of classification by the nomenclature of territorial units for statistics (NUTs), figure I shows the division of Portugal into NUTs. Thus, and reading from right to left, Portugal is a NUT I, Região Norte is a NUT II which comprises 8 regions at NUT III level: the metropolitan area of Porto and seven other NUTs III regions, namely, Alto Minho, Alto Tâmega, Ave, Cávado, Douro, Tâmega e Sousa (TamSousa), Terras de Trás-os-Montes (TerrasTM).

Figure 1. The distribution of Portuguese territory by NUT level, 2024



Source: Pordata (2024).

Região Norte stands out from the rest of the country due to the weight that the secondary sector assumes in the regional GVA (31.3%, above the national average) and for being the largest center of secondary activities in the country: 42.5% of the secondary sector national GVA, in 2020 (Fernandes and Baptista, op. cit.).

With the exception of the coastal area, it is generally an aging region, with a large area considered as low-density and with a low level of purchasing power, revealing deep asymmetries in terms of economic and social cohesion.

In Região Norte the primary sector has historically played a significant role. This region includes the Demarcated Region of the Douro (DRD), the oldest demarcated and regulated wine region, recognized by UNESCO as a World Heritage Site and internationally renowned for the production of Port Wine.

In the context of Portugal's agri-food sector and within the NUT II regions, Região Norte represents around 40% of the number of producers in the country and, in 2021, the gross added value (GVA) of the agri-food sector in the region totalled 1411 M€, distributed 30% by agriculture, animal production, hunting, forestry and fishing and 70% by the agri-food industry (INE, 2023b). This value corresponds to 25 per cent of (the total generated by the agri-food sector at national level and 4 per cent of the total GVA of Região Norte (INE, 2023a).

In agricultural terms, the region is characterised by its great physical diversity in terms of relief, altitude, soil characteristics, climate and water availability, which translates into a wide variety of crops and production systems.

As Fernandes and Baptista (op. cit.) highlight, agriculture with this diversity of crops and production conditions poses enormous challenges for public policies, which must find appropriate responses for each territory, on a place-based basis.

It is therefore precisely in order to contribute to this knowledge of the territory, which is fundamental to public policies, that we will move forward with the study of the region's productive specialisation and the location of activities in the agri-food sector.

The analysis of the relative specialization of the NUT III sub-regions (Table 1) indicates a dual specialization pattern, with inland sub-regions (Alto Tâmega, Douro and Terras de Trás-os-Montes) specialized in activities dependent on agriculture, natural resources, consumer and social services and the coastal sub-regions specialized in manufacturing industry. It should also be noted that in inland sub-regions, primary sector activities have a relevant weight in the total number of personnel employed and the gross added value of companies based there, although with much less significant values in the case of this last variable.

Table 1. NUTS III sectors with QLik>1 (People employed (PAS) and/or Gross value added (GVA)) and share in total NUT III PAS and/or GVA >2

NUTS III	QLik>1 (PAS or GVA) and share in total NUT III PAS and/or GVA >2%
Alto Minho	Manufacturing (PAS 27%; GVA 41%) Construction (PAS 14%; GVA 11%)
Cávado	Manufacturing (PAS 29%; GVA 33%) Construction (PAS 16%; GVA19%)
Ave	Manufacturing (PAS 46%; GVA 55%)
AMP	Manufacturing (PAS 23%; GVA30%) Wholesale and retail trade (...) (PAS 22%; GVA 22%) Human health (…) (PAS 5%; GVA 4%)
Alto Tâmega	Agriculture (...) (PAS 23%; GVA 5%) Mining (...) (PAS 1%; GVA 2%) Electricity (...) (PAS 0,4%; GVA 13%) Water collection (...) (PAS 2%; GVA 3%) Construction (PAS 12%; GVA 16%) Human health (…) (PAS 3%; GVA 5%) Other services (PAS 3%; GVA 1%)
Tâmega e Sousa	Mining (...) (PAS 6%; GVA 1%) Manufacturing (PAS 38%; GVA 39%) Construction (PAS 20%; GVA 24%)
Douro	Agriculture (...) (PAS 31%; GVA12%) Human health (...) (PAS 5%; GVA 6%)
Terras Trás-os-Montes	Agriculture (...) (PAS 34%; GVA 19%) Human health (PAS 5%; GVA 6%) Other services (PAS 3%; GVA 1%)

Source: Own elaboration based on INE data (INE, 2023a)

5. The agri-food sector activities and regional specialization

In order to study the relative location of the agri-food sector at NUT III level, we calculated location quotients for all the activities, at 4 and 5 digit level of CAE Rev. 3, taking as variables the number of people employed (PAS) and the volume of sales and services provided (VSP).

For each sector we computed the regional contribution to total (national) sectoral employment or turnover. Activities were grouped for their significance at national level: reduced (less than or equal to 10% of selected variables), medium (higher than 10% and less than 25%) or high (equal to or higher than 25%) relevance at national level.

The sub-regions that are relatively specialized in activities in which the Northern Region has reduced relevance at national level are mainly inland regions (Alto Tâmega, Douro and Terras de Trás-os-Montes) (Table 2).

Table 2. Regional activities with small relevance at national level (share of given variable – People employed (PAS) and / or Turnover (VSP) lower or equal to 10%)

Activity (CAE Rev. 3) / Share of Região Norte in the given variable at national level	Location quotient PAS 2020	Location quotient VSP 2020	Share of sub-regional turnover in total sectoral turnover (%)
Growing of cereals (0111) PAS 7%; VSP 5%	Douro 5,6	Douro 5,6	Douro 4
Growing of vegetables and melons, roots and tubers (0113) PAS 9%; VSP 6%	Terras TM 8,9	Terras TM 9	Terras TM 3
Growing of oleaginous fruits (0126) PAS 6%; VSP 2%	Terras TM 6,1	Terras TM 1,4	Terras TM 0,5
Farming of other cattle (except dairy) and buffaloes (01420) PAS 10%; VSP 5%	Alto Tâmega 3,5 Terras TM 2	Alto Tâmega 3,7 Terras TM 1,8	Alto Tâmega 1,1 Terras TM 0,6
Raising of sheep and goats (01450) PAS 4%; VSP 1%	Terras TM 3,6	Terras TM 1,6	Terras TM 0,6

Activity (CAE Rev. 3) / Share of Região Norte in the given variable at national level	Location quotient PAS 2020	Location quotient VSP 2020	Share of sub-regional turnover in total sectoral turnover (%)
Preparation and preserving of fruit and vegetables (103) PAS 9%; VSP 8%	Alto Tâmega 5,3 Terras TM 9,4	Alto Tâmega 5,1 Terras TM 14,8	Alto Tâmega 1,5 Terras TM 5,3

Source: Own elaboration based on Banco de Portugal (2023)

As for medium relevant activities, in addition to the sub-regions already mentioned, we have Alto Tâmega e Tâmega e Sousa, Alto Minho, Cávado e Ave (Table 3).

Table 3. Regional activities with medium relevance at national level: (share of given variable – People employed (PAS) and / or Turnover (VSP) higher than 10% and lower than 25%)

Activity (CAE Rev. 3) Share of Região Norte in the given variable at national level	Location quotient PAS 2020	Location quotient VSP 2020	Share of sub-regional turnover in total sectoral turnover
Growing of pome fruits and stone fruits (0124) PAS 19%; VSP 16%	Douro 18,4 Terras TM 3	Douro 21,3 Terras TM 2,6	Douro 15,1 Terras TM 1
Growing of other tree and bush fruits and nuts (0125) PAS 15%; VSP 15%	Ave <1 Alto Tâmega <1 TâmSousa <1 Douro 1,1 Terras TM 1,9	Ave 1,4 Alto Tâmega 2,3 TâmSousa 1,2 Douro <1 Terras TM 6	Ave 4 Alto Tâmega 0,7 TâmSousa 3 Douro 0,6 Terras TM 2
Raising of horses, asses, mules and hinnies (01430) PAS 20%; VSP 11%	Alto Minho 1,6 AMP <1	Alto Minho 2,6 AMP <1	Alto Minho 4 AMP 6
Mixed farming (01500) PAS 13%;VSP 14%	Cávado <1 AMP <1 Terras TM 3,2	Cávado 1,2 AMP <1 Terras TM 2,3	Cávado 4 AMP 6 Terras TM 0,8
Slaughtering of animals, processing and preserving of meat and meat products (101) PAS 26%; VSP 20%	Ave 2,5 AMP <1 Alto Tâmega 3,6 Douro 1,2 Terras TM 4,2	Ave 3 AMP <1 Alto Tâmega 2,9 Douro <1 Terras TM 1,9	Ave 10 AMP 5 Alto Tâmega 0,8 Douro 0,5 Terras TM 0,7
Manufacture of vegetable and animal oils and fats (104) PAS 17%; VSP 4%	Alto Tâmega 6,2 Douro 4 Terras TM 16,1	Alto Tâmega 2,6 Douro <1 Terras TM 2,8	Alto Tâmega 0,8 Douro 0,4 Terras TM 1
Manufacture of other animal goods (108) PAS 24%; VSP 19%	Ave 1,4 AMP <1 Alto Tâmega 2	Ave 1,3 AMP <1 Alto Tâmega <1	Ave 4 AMP 13 Alto Tâmega 0,2

Source: Own elaboration based on Banco de Portugal (2023)

The activities for which the contribution of Região Norte to the national total of personnel employed and/or the volume of sales and services provided by companies is very relevant (Table 4) are viticulture, dairy cattle breeding, beekeeping, rabbit farming, the dairy industry, the processing of cereals and legumes, the manufacture of bakery and similar products and the wine industry. AMP's contribution to the volume of sales and services provided in the indicated sectors (with the exception of beekeeping and rabbit farming) is very high, although this sub-region is, as a rule, not relatively specialized in those activities.

Table 4. Regional activities with medium relevance at national level: (share of given variable – People employed (PAS) and / or Turnover (VSP) equal or higher than 25%)

Activity (CAE Rev. 3) Share of Região Norte in the given variable at national level	Location quotient PAS 2020	Location quotient VSP 2020	Share of sub-regional turnover in total sectoral turnover (%)
Viticulture (0121) PAS 51%; VSP 44%	Alto Minho 1,6 AMP <1 AltoTâmega 1,1 TâmSousa 1,3 Douro 31,4 Terras TM 1,7	Alto Minho 1 AMP <1 AltoTâmega 1 TâmSousa 2 Douro 37,7 Terras TM 1,2	Alto Minho 1,5 AMP 9 AltoTâmega 0,3 TâmSousa 5 Douro 27 Terras TM 0,5
Dairy farming (01410) PAS 38%; VSP 32%	Alto Minho 1,7 Cávado 2,7 AMP <1 AltoTâmega 4 Douro 1,8	Alto Minho 1,6 Cávado 2,5 AMP <1 AltoTâmega 5,1 Douro 1,8	Alto Minho 2 Cávado 8 AMP 14 AltoTâmega 1,5 Douro 1
Beekeeping (01491) PAS 36%; VSP 28%	Alto Minho 2,1 AltoTâmega 10,7 TâmSousa 3,2 Douro 2 Terras TM 11,8	Alto Minho 1,4 AltoTâmega 15, 1 TâmSousa 3,7 Douro 3 Terras TM 19,9	Alto Minho 2 AltoTâmega 4 TâmSousa 8 Douro 2 Terras TM 7
Rabbit farming (01492) PAS 38%; VSP 58%	Cávado 1,9 Ave 1 AltoTâmega 24,8 Douro 5,5 Terras TM 21,2	Cávado 2,8 Ave 1,5 AltoTâmega 28,5 Douro 7,4 Terras TM 27,2	Cávado 9 Ave 5 AltoTâmega 8 Douro 5,3 Terras TM 10
Manufacture of dairy products (105) PAS 29%; VSP 41%	AMP 1,4 Douro 2,7	AMP 2,3 Douro 2,6	AMP 39 Douro 2
Manufacture of grain mill products, starcher and starch products (106) PAS 35%; VSP 42%	AMP 1,7 Terras TM 3,8	AMP 2,4 Terras TM 1,4	AMP 41 Terras TM 0,5
Manufacture of bakery and farinaceous products (107) PAS 33%; VSP 33%	Alto Minho 1 Ave 1,2 AMP <1 AltoTâmega 1,9 Tâmega e Sousa 1 Douro 1,6 Terras TM 1,5	Alto Minho 1,3 Ave 1,8 AMP 1,1 AltoTâmega 1,3 TâmSousa 1,1 Douro 1 Terras TM 1,2	Alto Minho 2 Ave 6 AMP 20 AltoTâmega 0,4 TâmSousa 3 Douro 0,7 Terras TM 0,5
Wine industry (1102) PAS 49%; VSP 55%	Alto Minho 1,4 AMP 1,3 TâmSousa 1,2 Douro 17,9 Terras TM 1,7	Alto Minho 1,6 AMP 1,7 TâmSousa 2,4 Douro 22,3 Terras TM 2,2	Alto Minho 2 AMP 29 TâmSousa 6 Douro 16 Terras TM 0,8

Source: Own elaboration based on Banco de Portugal (2023)

6. Clusters and production basins

After having identified, in the previous point, the activities of the NUTs III regions in the North with a high degree of relative location and which at the same time make a strong contribution to national GVA, we will then proceed to build clusters. That is, from the 8 sectors of Economic Activity, namely:

- Viticulture (CAE 01221);
- Dairy cattle farming (CAE 01410);
- Beekeeping (CAE 01491);
- Rabbit farming (CAE01492);
- Dairy industry (CAE 105);
- Manufacture of grain mill products, starcher and starch products CAE (106)
- Manufacture of bakery products and farinaceous products (CAE 107)
- Wine industry (CAE1102)

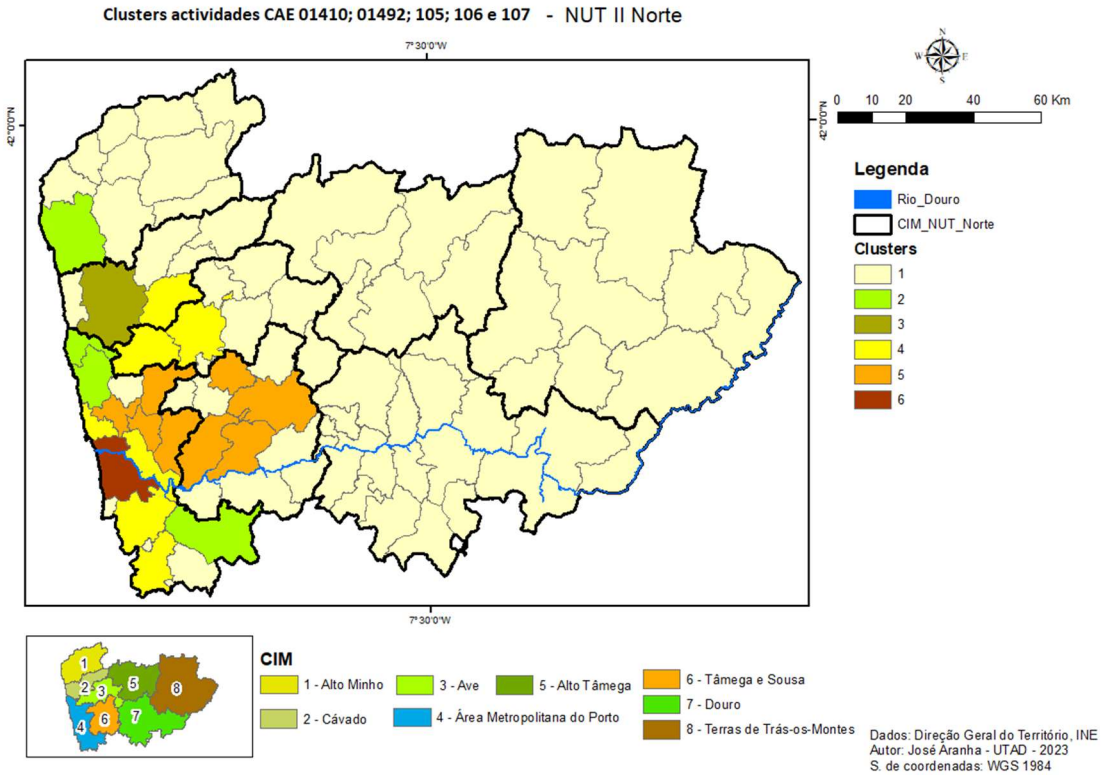
We will try to group the municipalities belonging to the NUTs III in the North by constructing clusters using a multivariate statistical process, based on the number of establishments existing in 2020 in each municipality for these sectors of activity, the only information available at municipal level for these CAEs.

In addition to the application of the aforementioned methods using IBM SPSS software (v.27), namely by constructing various groupings initially using hierarchical methods, as an exploratory measure, and later using non-hierarchical methods, as a confirmatory measure, a note should be made about the double iteration of this process.

In fact, in spite of the inherent nature of the algorithm, which uses a step-by-step process, adding pairs of cases in succession, it was also necessary, in order to obtain valid processes, to iteratively experiment with combinations of the 8 activities. This process resulted in 3 grouping or clustering processes for the 86 municipalities in the North.

In the first process, the municipalities were grouped into 6 clusters, based on 5 of the aforementioned 8 activities: Dairy cattle farming (CAE 01410); rabbit farming (CAE01492); dairy industry (CAE 105); Manufacture of grain mill products, starcher and starch products CAE (106); Manufacture of bakery products and farinaceous products (CAE 107). The results are shown on the map in Figure 1 and in Table 1.A in the Appendices.

Figure 2. Northern municipality clusters for establishments in Dairy cattle farming; Rabbit farming; Dairy industry; Manufacture of grain mill products; Manufacture of bakery products, in 2020



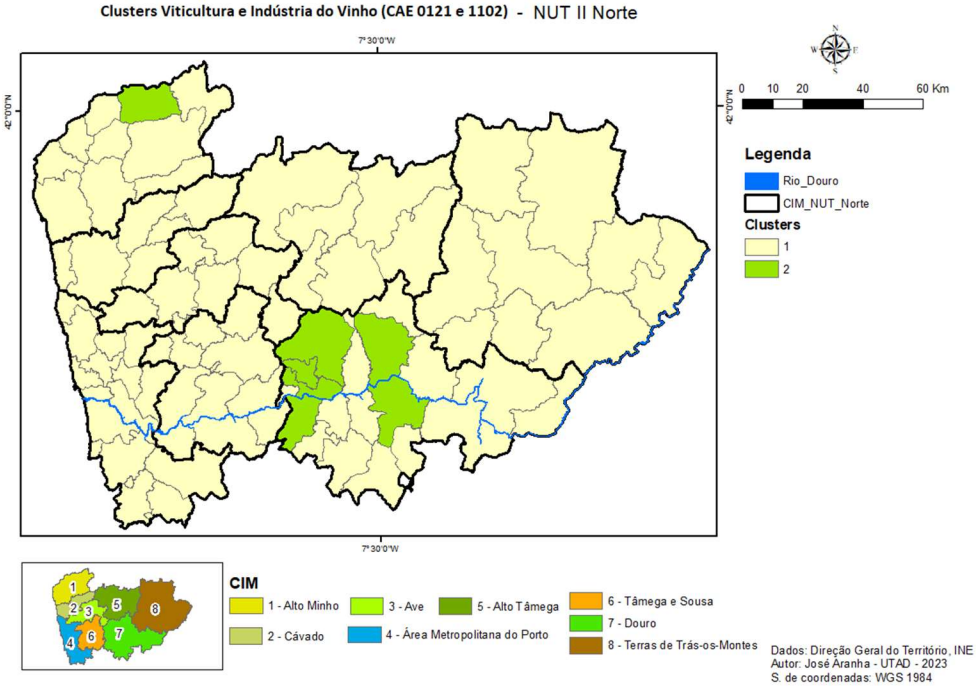
Source: Own elaboration based on INE data (2023a)

The clusters obtained have the following dominant characteristics:

- Cluster 6 - includes the two municipalities of Porto and Vila Nova Gaia, shown in red on the map, and dominates in terms of average number of establishments in the dairy industry, Manufacture of grain mill products, and also in the manufacture of bakery.
- Cluster 5 - this cluster occupies an intermediate position in most of the activities. It is made up of 8 municipalities, marked on the map in orange.
- Cluster 4 - This is the second largest cluster in the dairy industry, manufacture of grain mill products and the manufacture of bakery. Its 7 municipalities are marked in yellow.
- Cluster 3 - Made up of just one municipality, Barcelos, represented in dark green, which shows total dominance and by a long distance, by average number of establishments in Dairy cattle farming and Rabbit farming.
- Cluster 2 - counties with a strong representation in terms of Dairy cattle farming establishments and some prominence in the dairy industry. 4 counties, shown in light green.
- Cluster 1 - includes the remaining 64 municipalities of NUT II Norte (in cream), which have the lowest average values in most activities, with the exception of rabbit farming and dairy cattle farming.

In the second process of building clusters, and now taking into account the activities of viticulture (CAE 0121) and the wine industry (CAE 1102), the municipalities were grouped into 2 clusters (Figure 3 and Table 2.A in the Appendices).

Figure 3. Clusters of the municipalities of the North, relative to Viticulture (CAE0121) and Wine Industry (CAE 1102) establishments in 2020

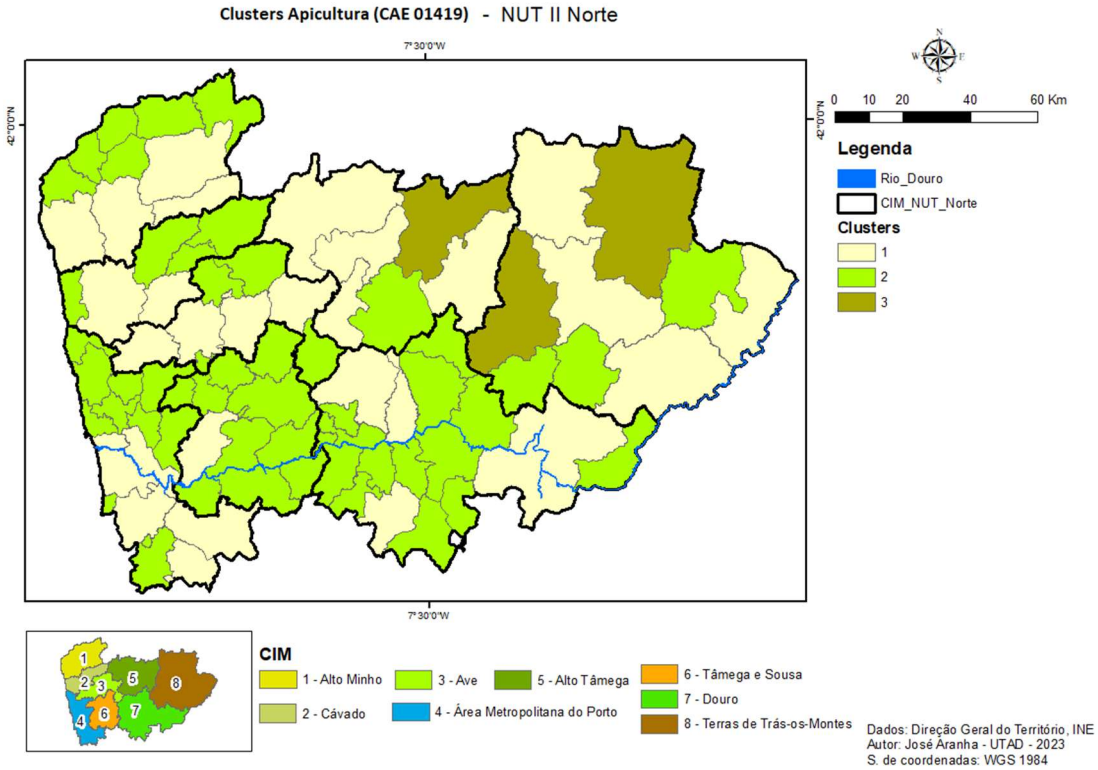


Source: Own elaboration based on INE data (2023a)

In this process linked to vineyards and wine, cluster 2 clearly emerges, made up of 7 municipalities (represented in green on the map), mostly dominated by municipalities in the Douro region. It is clearly evident that these municipalities (Alijó; Lamego; Monção; Peso da Régua; Santa Marta de Penaguião; São João da Pesqueira and Vila Real) have a higher average number of establishments in both viticulture and the beverage industry than cluster 1.

Finally, with only Beekeeping (CAE 01491) remaining, which could not be included in either of the two previous processes for reasons of statistical validation, this activity gave rise to a third process, seeking to analyse the similarities between the municipalities, also taking into account the number of establishments declared in 2020.

Figure 4. Clusters of municipalities in the North, relative to beekeeping establishments (CAE 01491) in 2020



Source: Own elaboration based on INE data (2023a)

Given the fact that there is only one variable, analysing the clusters is simpler and, without the need for additional tables, the municipalities were grouped according to the density of the average number of beekeeping establishments (Figure 4), resulting in 3 clusters:

- Cluster 3 - Composed by three municipalities: Chaves; Bragança and Mirandela, marked on the map in dark green. These are the municipalities with the highest number of establishments, with an average of 24.6 establishments per municipality.
- Cluster 2 - Represents the majority: 52 municipalities, around 60% of the municipalities under analysis, coloured in light green. Beekeeping in this cluster is very small, with an average of 2.6 per municipality.
- Cluster 1 - Comprises the remaining 31 municipalities. Represented on the map in beige, they have an average of 8.8 per municipality.

It should be noted that the only variable available for this more micro territorial analysis - the number of establishments - will certainly not be as interesting as those available at a higher geographical level, namely the number of people employed or GVA, but this is an insurmountable limitation due to data protection.

However, we believe that the territorial diversity within each NUTs III and at the same time the specificity of the level of the activities analysed justifies the interest, even with these limitations, of the study at county level and for these subclasses at the level of the CAE.

7. Discussion and final considerations

The analysis of the relative location of agri-food activities and of the specialization of NUTs III regions in Região Norte allowed us to group agri-food activities for which we obtained a relative location/specialization in three distinct groups, accordingly to the contribution of Região Norte to total sectoral employment and/or turnover.

The agri-food activities for which the contribution of Região Norte to the national total of personnel employed and /or turnover is very relevant and in which the region's NUTS III are relatively specialized are viticulture and wine industry, dairy farming and manufacturing of dairy products, manufacturing of grain and mill products, bakery and farinaceous, rabbit farming and beekeeping.

Following on from the analysis of the location of productive activities and the specialisation of regions, the next point was to group the municipalities of Região Norte according to common characteristics, i.e. to build clusters. Thus, taking into account the 8 activities in which the northern regions show a relative location quotient and at the same time a significant contribution to GVA, and based on a multivariate statistical procedure, groupings of municipalities with similar characteristics were obtained. Three cluster-building processes contributed to this process, in an iterative logic, in order to include all the desired activities.

Thus, from the first process, we conclude that in terms of the average number of establishments in the dairy industry (CAE 105); in manufacture of grain mill products, starcher and starch products (CAE 106) and also in the manufacture of bakery and other products (CAE 107), the municipalities of cluster 6 (Porto and Vila Nova de Gaia) dominate, followed by those of cluster 4 (municipalities of Braga; Guimarães; Vila Nova de Famalicão; Gondomar; Matosinhos; Oliveira de Azeméis and Santa Maria da Feira).

As for dairy cattle farming (CAE 01410), the average number of establishments in the municipality of Barcelos (cluster 3) prevails, followed by the municipalities in cluster 2 (Viana do Castelo; Arouca; Póvoa de Varzim and Vila do Conde).

With regard to rabbit farming (CAE 01492), although on average it is dominated by the cluster in the municipality of Barcelos, it is an activity represented in 33 municipalities, mostly in the interior north.

The second process focused on analysing the activities of viticulture (CAE 0121) and the wine industry (CAE 1102), resulting in a map with 2 clusters, in which cluster 2, made up of 7 municipalities, mostly in the Douro region, dominated both in terms of the number of viticulture establishments and the wine industry.

Beekeeping (CAE 01491) was analysed in the last process, which showed that the activity is present throughout the north, despite with a small number of establishments, certainly also associated with some informality, with an area close to the north-east of Trás-os-Montes standing out, with a much higher relative concentration of production units.

Finally, these results from grouping municipalities into clusters based on the number of establishments are very close to those obtained in studies on regional production basins. We are referring in particular to the results presented in the last major study on the agri-food sector in Região Norte (Fernandes and Baptista, op. cit.), where a mapping of crops in the North is presented, based on areas, production and/or animal numbers. This is the case with vineyards, where the Douro Demarcated Region stands out as the main Portuguese wine-growing region. This work also shows the distribution of dairy farming, highlighting a strong concentration of milk production in the municipalities of Vila Conde, Barcelos, Póvoa do Varzim and Famalicão, and beekeeping, especially in the municipalities of Penafiel and Mondim de Bastos.

So, the results obtained through clustering processes based on the number of establishments can be a methodological alternative to mapping production basins based on various variables, data which is sometimes very time-consuming and difficult to obtain.

We believe that these results are relevant, taking into account the guidelines of the various official documents relating to the smart specialisation strategy (Agência Nacional de Inovação, 2022; CCDR-N, 2023a; CCDR-N, 2023b). In fact, we consider that knowledge of the regions' production profile and regional specialisation is fundamental to meeting the challenges facing the agri-food sector. Namely, this knowledge is important for:

- boosting efficiency and optimising production by exploiting comparative advantages and reducing costs through economies of scale;
- planning for more sustainable development with efficient use of natural resources and mitigation of environmental impacts, since understanding the production profile can enable more rational use of water resources, soils and other inputs, promoting agricultural practices that are better adapted to the local ecosystem;
- -promoting food security by diversifying crops, reducing dependency and at the same time fostering resilience in the event of adverse events;

- encouraging innovation and research, because with detailed knowledge of regional conditions, research and the development of specific technologies that better meet local needs can be targeted and facilitates the dissemination of innovative practices and technologies adapted to the specific conditions of each region.
- to encourage better market planning and the creation of product commercialisation strategies, as well as improving the logistics associated with distribution.
- to promote regional development by creating jobs, boosting the local economy and attracting investment

Finally, knowing the production profile and regional specialisation helps governments formulate more effective public policies, targeting subsidies, tax incentives and technical support where they are most needed and it promotes a more efficient, resilient and sustainable agri-food sector.

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Appendices

Table 1 A. Cluster Statistics for Dairy cattle farming (CAE 01410), Rabbit farming (CAE 01492); Dairy industry (105); Manufacture of grain mill products (CAE 106); Manufacture of bakery products (107) Activities

Descriptives

CAE	Cluster	N	Mean	Std. Dev.	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Mín.	Máx.
Dairy cattle farming (CAE 01410)	1	64	5,33	8,321	1,040	3,25	7,41	0	39
	2	4	50,50	10,083	5,041	34,46	66,54	37	61
	3	1	143,00					143	143
	4	7	14,86	7,559	2,857	7,87	21,85	2	26
	5	8	4,50	4,140	1,464	1,04	7,96	0	11
	6	2	2,50	2,121	1,500	-16,56	21,56	1	4
	Total	86	9,66	19,187	2,069	5,55	13,78	0	143
Rabbit farming (CAE 01492)	1	64	0,91	1,488	0,186	0,53	1,28	0	6
	2	4	0,00	0,000	0,000	0,00	0,00	0	0
	3	1	4,00					4	4
	4	7	0,86	0,690	0,261	0,22	1,50	0	2
	5	8	0,25	0,463	0,164	-0,14	0,64	0	1
	6	2	0,00	0,000	0,000	0,00	0,00	0	0
	Total	86	0,81	1,376	0,148	0,52	1,11	0	6
Dairy industry (CAE 105)	1	64	0,56	1,022	0,128	0,31	0,82	0	6
	2	4	1,25	1,258	0,629	-0,75	3,25	0	3
	3	1	0,00					0	0
	4	7	2,57	1,512	0,571	1,17	3,97	0	4
	5	8	0,63	0,744	0,263	0,00	1,25	0	2
	6	2	7,50	3,536	2,500	-24,27	39,27	5	10
	Total	86	0,92	1,596	0,172	0,58	1,26	0	10
Manufacture of grain mill products (CAE 106)	1	64	0,22	0,576	0,072	0,07	0,36	0	2
	2	4	1,00	1,414	0,707	-1,25	3,25	0	3
	3	1	1,00					1	1
	4	7	2,00	2,887	1,091	-0,67	4,67	0	8
	5	8	1,00	1,309	0,463	-0,09	2,09	0	4
	6	2	2,50	0,707	0,500	-3,85	8,85	2	3
	Total	86	0,53	1,195	0,129	0,28	0,79	0	8
Manufacture of bakery products (CAE 107)	1	64	11,20	7,428	0,929	9,35	13,06	1	27
	2	4	34,50	13,626	6,813	12,82	56,18	16	47
	3	1	66,00					66	66
	4	7	83,00	12,596	4,761	71,35	94,65	67	100
	5	8	46,00	6,908	2,442	40,23	51,77	37	57
	6	2	121,50	17,678	12,500	-37,33	280,33	109	134
	Total	86	24,57	27,768	2,994	18,62	30,52	1	134

ANOVA

		Sum of Squares	df	Mean Square	Z	Sig.
Dairy cattle farming (CAE 01410)	Between Groups	26156,754	5	5231,351	81,510	0,000
	Within Groups	5134,467	80	64,181		
	Total	31291,221	85			
Rabbit farming (CAE 01492)	Between Groups	17,229	5	3,446	1,917	0,101
	Within Groups	143,795	80	1,797		
	Total	161,023	85			
Dairy industry (CAE 105)	Between Groups	115,841	5	23,168	18,426	0,000
	Within Groups	100,589	80	1,257		
	Total	216,430	85			
Manufacture of grain mill products (CAE 106)	Between Groups	31,958	5	6,392	5,717	0,000
	Within Groups	89,438	80	1,118		
	Total	121,395	85			
Manufacture of bakery products (CAE 107)	Between Groups	59909,222	5	11981,844	170,201	0,000
	Within Groups	5631,859	80	70,398		
	Total	65541,081	85			
R^2=88,6%						

Source: Own elaboration by IBM SPSS and with data from INE (2023a)

Table 2.A. Cluster Statistics for Viticulture (CAE0121) and Wine Industry (CAE 1102) Activities

Descriptives

CAE	Cluster	N	Mean	Std. Dev.	Std. Error	95% Confidence Interval for Mean Lower Bound	Upper Bound	Mín.	Máx.
Viticulture (CAE0121)	1	79	120,949	149,104	16,776	87,552	154	2	588
	2	7	1058,000	181,597	68,637	890,051	1226	873	1 399
	Total	86	197,221	298,587	32,197	133,204	261	2	1 399
Wine Industry (CAE 1102)	1	79	6,291	8,700	0,979	4,342	8	0	42
	2	7	24,143	12,006	4,538	13,039	35	9	39
	Total	86	7,744	10,186	1,098	5,560	10	0	42

ANOVA

		Sum of Squares	df	Mean Square	Z	Sig.
Viticulture (CAE0121)	Between Groups	5646155,005	1	5646155,005	245,489	0,000
	Within Groups	1931965,797	84	22999,593		
	Total	7578120,802	85			
Wine Industry (CAE 1102	Between Groups	2049,211	1	2049,211	25,429	0,000
	Within Groups	6769,161	84	80,585		
	Total	8818,372	85			
R2=74,4%						

Source: Own elaboration by IBM SPSS and with data from INE (2023a)

DETECTING FOR CONVERGENCE TRENDS AMONG CHINESE UNIVERSITIES IN TERMS OF ACADEMIC PERFORMANCE

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Abstract

Under the conditions of the rapid market liberalization process that China has been experiencing, questions of spatial cohesion – and thus of convergence and divergence – become increasingly salient. This is so as the elimination of spatial imbalances is both a pre-condition and a core objective of the reforms aiming at market liberalization. The paper aims at detecting trends of convergence among Chinese universities in terms of academic performance. Taking into consideration that within the knowledge-based economy universities are emerging growth determinants, the topic of the paper is extremely important. This is so as the possible prevalence of divergence trends may indicate that the growth impact of Chinese universities is not space neutral. The empirical analysis of the paper covers the period 2018/19-2022/23, utilizes data obtained from the URAP database, and employs the methodological approach of gaps convergence clubs. The findings of the paper provide valuable insight into both theory and policy.

Keywords: Chinese universities, academic performance, gaps convergence clubs
JEL classification: C21, O43, O47

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1. Introduction

Within the knowledge-based economy, universities are emerging growth determinants. In addition to their traditional role in teaching and basic research, universities are expected to engage in regional development processes facilitating the creation of knowledge capital through the diffusion of knowledge spillovers (Lendel 2010, Chen et al. 2014, Trippl et al. 2015, Adamakou et al. 2021b, Adamakou et al. 2021c, Kallioras et al. 2021, Fernández Del Río 2022 inter alia). It is the helix framework (Etzkowitz and Leydesdorff 2000, Carayannis and Campell 2009, Carayannis et al. 2012, Höglund and Linton 2018, inter alia) that forms an ever-growing body of literature that aptly describes university–industry–government–public–environment interactions. Thus, the question regarding the impact of universities on spatial disparities is extremely meaningful. Indirectly but clearly, the possible prevalence of divergence trends among universities, in terms of academic performance, indicates that the growth impact of universities is not space neutral.

The paper aims at detecting trends of convergence among Chinese universities in terms of academic performance. Under the conditions of the rapid market liberalization process that China has been experiencing, transitioning, since the late 1970s, from a state-dominated planned socialist economy to a mixed economy (Naughton 2007, Schaffar and Dimou 2010, Kroeber 2016, Weber 2021 inter alia), questions of spatial cohesion – and thus of convergence and divergence – become increasingly salient. This is so as the elimination of spatial imbalances is both a pre-condition and a core objective of the reforms aiming at market liberalization (Wei 2002, Fan 2006, Fan et al. 2011, Li et al. 2013 inter alia). Towards the latter, the higher education system has been an essential part (Xiong et al. 2022). With the increase in the income level, the demand for higher education in China has increased remarkably (Li et al. 2014, Yue 2015). Having achieved the goals of massification and popularization, the transformation from scale expansion to quality improvement is, now, the dominant goal for higher education in China (Li 2016, Xi 2022).

The current section of the paper is introductory. The next section presents the data. The third section presents the methodology. The penultimate section performs the empirical analysis. The last section of the paper offers the conclusions.

2. Data

URAP (University Ranking by Academic Performance) has developed a ranking system for world universities based on academic performance indicators that reflect the quality and the quantity of their scholarly publications (Table 1). The URAP ranking system provides scores of academic performances and not just, merely, the ranking of each university. Compared to the most widely-read university ranking systems (i.e., QS (Quacquarelli Symonds), THE (Times Higher Education), ARWU (Academic Ranking of World Universities)), URAP covers considerably more universities. Even though URAP excludes teaching indicators – and this is a major point of criticism (Rauhvargers 2011, 2013 and 2014) – it enjoys a high level of acceptance (Nethal and Harrison, 2014, Adamakou et al. 2021a).

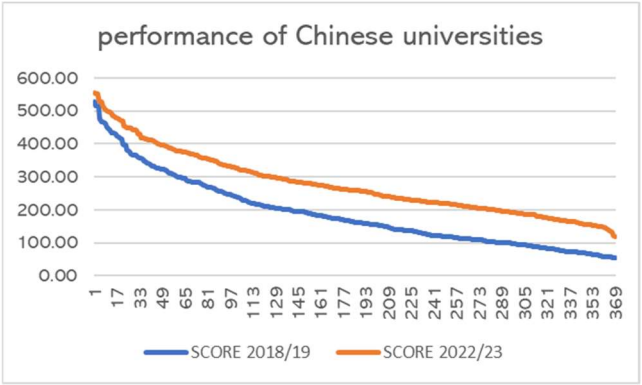
Table 5. The URAP ranking system

Indicator	Explanation	Weight
Article	articles published in journals that are listed within the first, second and third quartiles in terms of their journal impact factor	21%
Citation	the total number of citations received in the past four years for the articles published in the past four years in journals that are listed within the first, second and third quartiles in terms of their journal impact factor	21%
Total Document	all scholarly output of the institutions, published during the past four years	10%
Article Impact Total	the scientific productivity corrected by the institution's normalized citations per publication with respect to the world citations per publications in 23 subject areas in the past two years	18%
Citation Impact Total	the research impact corrected by the institution's normalized citations per publication with respect to the world citations per publication in 23 subject areas in the past two years	15%
International Collaboration	the total number of articles published in collaboration with foreign universities	15%

Sources: URAP / Authors' elaboration

The empirical analysis of the paper covers the period 2018/19-2022/23 and utilizes data obtained from the URAP database. URAP provides data for 498 Chinese universities located in mainland China (i.e., the territory under direct administration of the Chinese government). However, 369 universities (the names are available upon request) are included in the analysis since they have data for both periods under consideration. Comparing the academic performances between the period 2018/19 and the period 2022/23, it is noteworthy that: (a) the scores for all universities are moving upwards (Image 1), (b) the standard deviation of the scores is decreasing (Table 2), and (c) the universities that possess the lowest places in the ranking (i.e., bottom-10 universities) during the period 2018/19 exhibit higher increases compared to the universities that correspondingly possess the highest places (i.e., top-10 universities) (Table 3 and Table 4).

Image 6. Academic performance of Chinese universities, periods 2018/19 and 2022/23



Sources: URAP / Authors' elaboration

Table 2. Academic performance of Chinese universities, periods 2018/19 and 2022/23

	performance 2018/19	performance 2022/23
min	55.70	118.86
max	526.05	556.14
mean	189.71	277.15
st. dev.	106.14	95.97

Sources: URAP / Authors' elaboration

Table 3. Academic performance change of the top-10 universities, period 2018/19 and time interval 2018/19-2022/23

universities (top-10)	score 2018/19	Δ score (%) 2018/19-2022/23
1. Tsinghua University	526.05	5.09
2. Peking University	516.15	3.97
3. Shanghai Jiao Tong University	515.57	7.87
4. Zhejiang University	511.04	7.82
5. Fudan University	476.62	7.94
6. Huazhong University of Science & Technology	466.78	13.00
7. Sun Yat Sen University	466.21	12.93
8. University of Science & Technology of China	462.16	8.61
9. Nanjing University	460.19	5.08
10. Xi'an Jiaotong University	449.83	11.12

Sources: URAP / Authors' elaboration

Table 4. Academic performance change of the bottom-10 Chinese universities, period 2018/19 and time interval 2018/19-2022/23

universities (bottom-10)	score 2018/19	Δ score (%) 2018/19-2022/23
360. Shanghai University of Sport	58.03	188.71
361. Jining University	57.63	106.25
362. Jiujiang University	57.35	168.63
363. Gannan Medical University	56.51	173.70
364. Shenyang Jianzhu University	56.43	183.18
365. Shaanxi University of Technology	56.42	169.53
366. Tianjin Agricultural University	56.30	138.69
367. Binzhou University	55.84	148.26
368. Binzhou University	55.71	119.91
369. Yanan University	55.70	250.41

Sources: URAP / Authors' elaboration

3. Methodology

The paper employs the methodological approach of gaps convergence clubs (Chatterji 1992, Chatterji and Dewhurst 1996), in order to detect for convergence trends, in terms of academic performance, among Chinese universities. The methodological approach of gaps convergence clubs transcends the rationale of linearity, pointing out that it is quite natural to expect that groups of entities are converging but that these groups are themselves diverging from each other. Broadly speaking, this means that convergence and divergence trends may coexist, although in different proportions and at different strengths (Petrakos et al. 2011). Convergence clubs are related with a wide variety of empirical models that allow for multiple regimes (Azariadis and Drazen 1990, Durlauf 1993, Galor 1996, Quah 1996 *inter alia*).

The methodological approach of gaps convergence clubs requires the identification of a "leading" entity. The latter may be considered as the entity with the highest figure in terms of the variable under consideration among the entities considered. The gap is the quotient between the figure of the variable under consideration that belongs to the "leading" entity and the figures of the variable under consideration that belong to each of the entities considered (including the "leading" entity). The approach of gaps convergence clubs relates the gap, in terms of the variable under consideration, at one date with the corresponding gap at an earlier date, including further powers of the latter (Equation 1). The reference point of the approach of gaps convergence clubs is the pre-assumption of specific polynomial functions and the consequent classification of the entities considered into convergence clubs on the basis of the corresponding pre-assumed equilibria (Artelaris et al. 2010, Artelaris et al. 2012, Anagnostou et al. 2016, Kallioras et al. 2017, Ekonomou and Kallioras 2020). Apparently, considering that considerable multicollinearity makes difficult the choice of the best parsimonious

estimation, the final specification of the equation is made under the rule of dropping out the statistically insignificant coefficients. When more than one equation have statistically significant coefficients, the specification with the lowest Akaike Information Criterion (AIC) (Akaike 1974) figure is chosen.

$$\ln\left(Y_{l,f}/Y_{e,f}\right) = \sum_{p=1}^{n} \gamma_p \left[\ln\left(Y_{l,b}/Y_{e,b}\right)\right]^p + u_e \quad (1)$$

b = base (i.e., initial) year, f = final year, e = entities considered ("leading" entity is included), l = "leading" entity, Y = variable under consideration, γ = coefficient, p = power, n = highest power, u = disturbance term

The interpretation of the estimated (i.e., the selected) equation necessitates the utilization of the graphic representation of the $y = x$ equation (i.e., the 45°-straight-line) as a benchmark. Such a benchmark eases the interpretation evincing the entities that, on average, converge to the "leading" one as well as the entities that, on average, diverge from the "leading" one. Particularly, convergence to the "leading" entity is detected when, on average, the gap in the final year is lower than the corresponding gap in the initial year (i.e., the line of the estimated equation is below the line of the benchmark equation, in the first quarter). Divergence from the "leading" entity is detected, otherwise.

4. Empirical analysis

The econometric investigation for the emergence of convergence clubs among Chinese universities, in terms of academic performance, indicates that the second-power equation is the best parsimonious equation (Table 5). The dependent variable of the model is the gap in the period 2022/23 and the independent variable is the corresponding gap in the period 2018/19. The "leading" university is Shanghai Jiao Tong University. This is the university with the highest academic performance in the period 2022/23 (for the period 2018/19, the university with the highest academic performance is Tsinghua University). The overall explanatory power of the model (Adjusted R-squared) is extremely satisfactory (0.92) and the independent variable of the model is statistically significant (at the 1% level of significance) in both the first and the second power. The corresponding first-power, third-power, and fourth-power equations have been rejected (see Table A1, Table A2, and Table A3 in the Appendix). The third-power and the fourth-power equations have been rejected because they have statistically non-significant terms (i.e., in both equations the independent variable is statistically significant in the first power only). The first-power equation has been rejected, even though the independent variable is statistically significant, because compared to the corresponding second-power equation the AIC figure is lower.

Table 5. Convergence clubs among Chinese universities, time interval 2018/19-2022/23

Dependent Variable: GAPSCORE2022/23
Included observations: 369

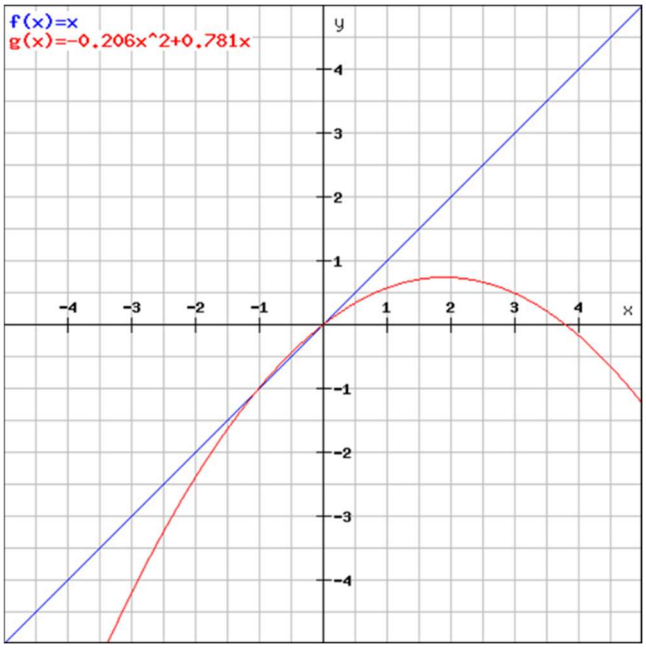
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GAPSCORE2018/19	0.781341	0.015853	49.28599	0.0000
GAPSCORE2018/19^2	-0.205558	0.022291	-9.221425	0.0000

R-squared	0.910877	Mean dependent var	0.327398
Adjusted R-squared	0.910635	S.D. dependent var	0.146614
S.E. of regression	0.043829	Akaike info criterion	-3.411637
Sum squared resid	0.705000	Schwarz criterion	-3.390440
Log likelihood	631.4470	Hannan-Quinn criter.	-3.403216
Durbin-Watson stat	1.707285		

Sources: URAP / Authors' elaboration

The graphic visualization of the estimated equation and the benchmark equation (i.e., y=x) (Image 2) eases the interpretation of the results. Evidently, in the 1st quadrant (i.e., the upper-right quadrant) the line of the estimated function is below the line of the benchmark. Indeed, solving the corresponding system of equations, it comes that the solutions are (-1.063, -1.063) and (0.000, 0.000). Thus, the only solution in the 1st quadrant is (0.000, 0.000). This indicates that, on average, all Chinese universities converge to the "leading" university (i.e., Shanghai Jiao Tong University) and *inter se*. In other words, all Chinese universities form one convergence club. Moreover, the pace of convergence is incremental. This is so as the estimated function is concave down, with a local maximum at (2.114, 2.114), and all Chinese universities fall into the ascending part of equation (i.e., the highest initial gap is 0.967; Yanan University).

Image 2. Convergence clubs among Chinese universities, graphic visualization, time interval 2018/19-2022/23



Sources: URAP / Authors' elaboration

5. Conclusions

The question regarding the impact of universities on spatial disparities is extremely meaningful, considering that, within the knowledge-based economy, universities are emerging growth determinants. Indirectly but clearly, the possible prevalence of divergence trends among universities, in terms of academic performance, indicates that the growth impact of universities is not space neutral. The paper conducts an empirical analysis for convergence trends among Chinese universities, in terms of academic performance. Under the conditions of the rapid market liberalization process that China has been experiencing, questions of spatial cohesion become increasingly salient. This is so as the elimination of spatial imbalances is both a pre-condition and a core objective of the reforms aiming at market liberalization. The empirical analysis of the paper covers the time interval 2018/19 – 2022/23, utilizes data obtained from URAP, and employs the methodological approach of gap convergence clubs.

The findings of the paper indicate that all Chinese universities form one convergence club, with incremental convergence pace, and provide valuable insight into both theory and policy. In terms of theory, the findings of the paper demonstrate that public policies can generate self-correcting mechanisms for spatial imbalances, irrespective of the ability of the markets to do so. Thus, convergence is (also) a policy-led process that does not take place in an institution-free environment. In terms of policy, the findings of the paper demonstrate the importance of policy interventions focusing on alleviating institutional imbalances across Chinese

educational space. Up to now, it seems that that a set of well-targeted and carefully-designed tertiary education policies have been implementing by the Chinese government.

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REGIONAL SPECIALIZATION IN THE CONTEXT OF DEINDUSTRIALIZATION: THE CASE OF TÜRKİYE

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Abstract

Deindustrialization is experienced in different forms and more deeply in developing countries where regional inequalities, an important component of deindustrialization, impose more structural and historical conditions than in developed countries. Deindustrialization has a deeper causality and impact especially in countries whose economies are based on agriculture and which begin to deindustrialize with global effect while their industrial development continues. The aim of this study is to investigate the regional nature of deindustrialization within the center-periphery relationship at the global and country level. Assuming that the international center-periphery relationship has similar characteristics on a national scale, in this study the regional character of deindustrialization at the level of sectoral specializations is investigated in Türkiye NUTS 2 regions by performing a long-term Location Quotient (LQ) analysis. The main results of the analysis demonstrate that: (i) while Türkiye is an agricultural society and its industrial development continues, it has entered the deindustrialization process with globalization effect; (ii) the pattern of deindustrialization can be exemplified by the regional cluster centered on Istanbul in the Northwest which shows high industrial specialization; (iii) agricultural production dominates throughout the country; and (iv) there is a tendency for industrial development to stagnate and for a direct transition from agriculture to services.

Keywords: Deindustrialization, Labor Market, Regional Specialization
JEL classification: J01, J08, J21, N90, O11, R12

1. Introduction

In the era of radical globalization, international trade and the transfer of industrial activities have become an important component of deindustrialization since the 1990s. During this process, deindustrialization occurred in different ways in developing countries compared to developed countries. It has a deeper causality and impact, especially in countries whose economies are based on agriculture and which begin to deindustrialize with global effect while their industrial development continues. Studies on different forms of deindustrialization, its consequences for developing economies, and regional differences at the national level are relatively new in the literature.

The aim of this study is to investigate deindustrialization with its regional nature within the center-periphery relationship at the global and country level. Deindustrialization research often focuses on measuring deindustrialization in a particular economic unit and/or seeking urban revitalization. In this study, an attempt was made to develop a holistic perspective on deindustrialization at the intersection of regional planning, sociology, economy and history. Thus, the historical-structural causality of the effects of deindustrialization on the ability or inability to change the economic geography is emphasized.

Against this background, the next section explains the definition of deindustrialization and its global meaning within the conceptual framework. The different causality and temporality of deindustrialization in developed and developing countries are emphasized. According to the information and data obtained, deindustrialization largely depends on capital mobility within the center-periphery relationship and the displacement of regional specializations. In the third part, by performing a Location Quotient (LQ) analysis, sectoral specializations were

found in 26 regions of Türkiye's NUTS 2 region. The analysis covers a 12-year period, 2009-2020. Findings are classified into regions of full, high and medium specialization and mapped in ArcGIS. In the fourth section, the results are explained and interpreted according to the analysis findings, and suggestions for countering deindustrialization are given.

2. Conceptual Framework: What is Deindustrialization?

Deindustrialization was defined within the scope of economic growth as a normal process primarily related to productivity in developed countries, in studies as early as the 1940s reflecting neoclassical economic thought. Definitions of deindustrialization are based on explanations defined in three sectors or the Clark-Ficher model in the works of Clark (1940) and Ficher (1939). Accordingly, structural change and development in the economy is explained by an expansion from the primary sector (agriculture) to secondary (industry) and tertiary (service) sectors. In this context, in its most basic definition in the classical view, deindustrialization refers to the situation where productivity in the industrial sector stimulates services and the service sector workforce increases while the industrial workforce decreases.

Studies of the 1960s also examined deindustrialization within the context of economic growth. Some of them shared the pioneering views of the 1940s and described this as a normal process (See Rostow 1959; Kuznets 1973). On the other hand, critical views have developed claiming that industry is a dynamic sector in economic development and that, despite the increase in the service sector, the decrease in production will impede economic growth (See Kaldor 1966).

Since the 1980s, deindustrialization has gained a global character and studies; focusing on regional changes, capital mobility, international trade, center-periphery relation between and within countries and regional inequalities, have developed (See Bluestone 1984; Krugman 1988,1991; Rowthorn and Ramaswamy 1997; Şenses 2004; Kollmeyer 2009a-b; Lorenzi and Berrebi 2016; Maslikhina 2018; Doğruel and Doğruel 2019; Duran 2019; Gubanova E, Voroshilov 2019; Pike 2020; Vu et al. 2021; Kozhevnikov 2021; Clark 2022; Uzsayılır and Baycan 2023; Liu and An 2023, Simic 2023).

Among these studies, Krugman brought a new perspective to neoclassical economics regarding the reasons for the concentration (agglomeration) of industrial activity, and introduced the center-periphery relationship into the discussion by questioning "Why and when does manufacturing become concentrated in a few regions, leaving others relatively undeveloped?" (Krugman 1991:484). In this context, Bluestone argued that there was a great capital mobility at the regional and sector level in America and that the loss of employment that occurred in this process was a serious economic problem (Bluestone 1984:43-51).

Among the studies on the causes of deindustrialization, according to Rowthorn and Ramaswamy, who share the classical economic view, the cause of deindustrialization is the increase in productivity in industrial production in developed countries, North-South trade has a minor role in its emergence, and deindustrialization in developing countries is more related to its internal dynamics (Rowthorn and Ramaswamy 1997:2-11). On the other hand, Kollmeyer emphasizes the importance of the globalization effect, the reason for his different views from Rowthorn and Ramaswamy being related to measurement methods. In his research, Kollmeyer acknowledged the impact of increased welfare and consumer demands in developed countries, but argued that North-South trade was a large part of deindustrialization and explained its regional impact in the context of "unequal exchange theory" (Kollmeyer 2009a:1644,1660-1970/ 2009b: 820-822).

The important component of North-South trade during the period of deindustrialization is the transfer of industrial activity. Lorenzi and Berrebi investigated the effects of offshoring from developed countries to emerging countries and revealed that industrial activity shifted sharply, especially in the 1995-2005 period, in a much more specific way and to a more specific set of regions than in the 1970s (Lorenzi and Berrebi 2016:76-79).

Şenses draws attention to the form of deindustrialization that differs between center and periphery countries in this process. He states that underdeveloped countries have deindustrialized before completing their industrial development, with a misleading similarity to the developed economies (See Şenses 2004:6-18). Accordingly, it can be argued that North-South trade became a major part of deindustrialization during the radical globalization phase, increasing regional inequalities. This process also differs temporally.

According to Doğruel and Doğruel, while deindustrialization before the 90s expressed structural changes due to internal factors in developed countries, the effect of globalization began to come to the fore after the 90s (Dogruel and Doğruel 2019:214-225). Focusing on regional development in Russia, Maslikhina, highlighted the increasing regional inequalities due to external influence and internal factors after 1990 until 2005, as well as the interrelationship between underdevelopment and economic growth (Maslikhina 2018). Vu and colleagues argue that deindustrialization became permanent by experiencing a significant structural change in the post-1990 period, when the acceleration of globalization with the rise of North-South trade had a significant impact. In countries with larger populations and where the trade balance tends to be in deficit, deindustrialization tends to be more severe and has become more pronounced in the post-1990 period (Vu et al. 2021). In their study focusing on the relationship between poverty and deindustrialization after 1990, Liu and An argue that deindustrialization followed different paths in developed and developing economies and increased poverty in developing countries during this period (Liu and An 2023).

On the regional differences of deindustrialization on a global scale, according to the study of Uzsayılır and Baycan (2023), deindustrialization took place at different times and in different forms in developed economies and developing ones. Developed countries started to deindustrialize while their industrial development was at a high level and largely completed this structural transformation by the 1990s. In developing countries, the global impact comes to the fore in deindustrialization and this gained momentum after the 1990s. In developing economies of the first category, China, India and Indonesia are the countries that industrialized rapidly, especially after the 2000s, with the influence of North-South trade. However, service employment has also increased due to specialization in China, and a trend towards deindustrialization has begun to be observed since 2012. In the second category, countries such as Russia and South Korea, which developed with statist policies during the industrialization period, and island countries such as Australia, Hong Kong and Singapore, which have long-established economic relations with developed economies, have also entered the process of deindustrialization due to global influence, but they are relatively advantageous because they entered this process while their industries were at a high level. In the third category, the main trend in Türkiye, Brazil and Mexico was their rapid and sudden transition from import substitution policies to the free market, while they were agricultural societies and their industrial development was still continuing. In this category, there is a relative increase in service employment against a sharp decline in agriculture and stagnation in industry. This means a direct transition from agriculture to services, thus increasing the problems of unemployment, regional inequality and rapid urbanization. In the second and third category countries, deindustrialization occurred significantly between 1990 and 2000 (Uzsayılır and Baycan 2023: 291-294).

Studies on the regional effects of deindustrialization at the country level mostly focus on the post-industrial situation in the major industrial regions and/or large cities of developed countries (See Lever 1991; Sieber 1991; Cowie and Heathcott 2003; O'Hanlon and Hamnett 2009; High et al. 2017; Taft 2018; Pike 2020; Walling 2022; Yazgan et al. 2022).

Regional studies in the context of deindustrialization in developing countries are relatively new and span a wide range of regions and scopes (See Silva 2019; Tahsin and Börü 2020; Karahasan 2020; Deineko and Tsyplitska 2020; Safronova and Zotovab 2021; Neto et al. 2022; Sakarya 2023; Lar and Taguchi 2024). This may be related to the fact that deindustrialization in developing countries occurs at different times, with different dynamics, and is divided into various forms compared to developed countries. On the other hand, this is precisely the main common point shared by developing countries. Based on this point, the increase in local-regional studies at the country level could provide more information about the collaborations and regional industrial policies that can be developed in non-Western economies or the Global South. Therefore, in the next part of the study, addressing Türkiye, the relationship between sectoral specializations and deindustrialization at the country level is investigated.

3. Regional Deindustrialization in Türkiye

3.1. Background

It can be argued that deindustrialization is continuous with the development problems that emerged with modern industry in Türkiye. The problem of development in Türkiye started with the dissolution of regional specializations in the Ottoman Empire from the 17th century. From this date onwards, Istanbul rapidly became the centralising focus and began to separate from the rest of Anatolia[1] (See Karpat 2006, 2008; Tekeli 2008; Keyder 2014, 2018; Boratav 2019).

The national economy in the early republican period was an exceptional period of development for Türkiye during which it determined its own role in the new world. After the Second World War, the Cold War period and the ongoing process with the oil economy changed the direction of economic policies all over the world. This period which started in the 1950s and lasted until the end of the 1970s was the liberalization period. Between 1960 and 1980, statist policies, which began to be seen at the global level, were reflected in import substitution policies in Türkiye, and this period witnessed the pangs of democracy on the one hand, and rapid industrialization-urbanization movements on the other.

The reflection of neoliberal ideology in Türkiye, which began to be effective in economic policies with the global oil crisis, can be seen in the decisions of January 24, 1980 and the IMF programs. This period was also the beginning of deindustrialization. After the 2000s, this process began to become institutionalized and gained momentum.

Industrial employment shares in Türkiye have gradually decreased since the 1990s. According to the study of Uzsayılır and Baycan (2023), it was 29.65% in 1991 and 25.31% in 2019. There was a more dramatic decrease in the agricultural employment share. While it was 29.76% in 1991, it had dropped to 18.11% by 2019. On the other hand, the service employment share increased from 40.58% in 1991 to 56.56% in 2019, a relative increase. During this period, unemployment rates were 8% in 1991 and 14% in 2019.

Under the conditions of radical globalization, the rise of the services sector in developed economies due primarily to productivity, rapid progress in technology, the accessibility of every part of the world and the distributability of manufacturing, and the international transfer of industrial activity have led to industrialization and the development of specializations in some emerging economies in Asia. This new form of international trade has caused stagnation of industrial development and premature deindustrialization in some developing countries. In this sense, although Türkiye continues to remain relatively stable in industrial income, it has begun to deindustrialize in employment, which is the main measurement unit of deindustrialization. This situation causes the development of industrial production and specializations in Türkiye to stagnate and a direct transition from agriculture to services.

3.2. Sectoral Specializations in NUTS 2 Regions

In this study about the local dynamics of change in regional specializations on a global scale, sectoral specializations in Türkiye's NUTS 2 regions were investigated by making a Location Quotient (LQ) analysis. The following calculations were used:

1. (ei)/(en): ratio of regional employment by sectors to total regional employment.

(The ratio of agriculture, industry and service employment figures in each of the Level 2 regions to the total employment figures in each of the Level 2 regions).

2. (Ei)/(En): ratio of national employment by sectors to total national employment.

(Ratio of Türkiye's agriculture, industry and service employment figures to total employment)

3. LQ = [(ei/en) /(Ei/En)]

LQ is a classical analysis method developed by Florence in 1939. It can be carried out using different variables and data sets. Essentially, it gives the ratio of employment in any sector in a region to employment in the same sector across the country. There are different

[1] Anatolia is also known as Asia Minor. The land mass of Anatolia constitutes most of the territory of Türkiye. In everyday language, it is used for all lands of Türkiye except the Istanbul region.

assumptions about the threshold value. According to general acceptance, in the region where the sector coefficient is above 1, there is specialization in that sector. An important cut-off point 1.25 is the limit where the agglomeration is concentrated and/or the lowest accepted limit required for an industry in a region to be considered an exporter. It is seen that in regions where specialization is very high, the threshold value can be accepted as 2 or even 3. Depending on the threshold value, different value ranges fall below or above the threshold value; Classifications such as none, weak, medium, upper middle, high and full specialization were used (See Levy 1985:98; Yardımcı 2014:58,59; Çiftçi 2018:555,556; Ergen and Oğuz 2018:118).

In the light of this information, the specialization threshold value was accepted as 1, considering the stagnation of regional specializations, which is the specific condition of the universe. Another important threshold value, 1.25, was determined as the high specialization limit and 2 as the full specialization limit.

LQ≥2.00 = Full specialization

1.25-2.00 = High specialization

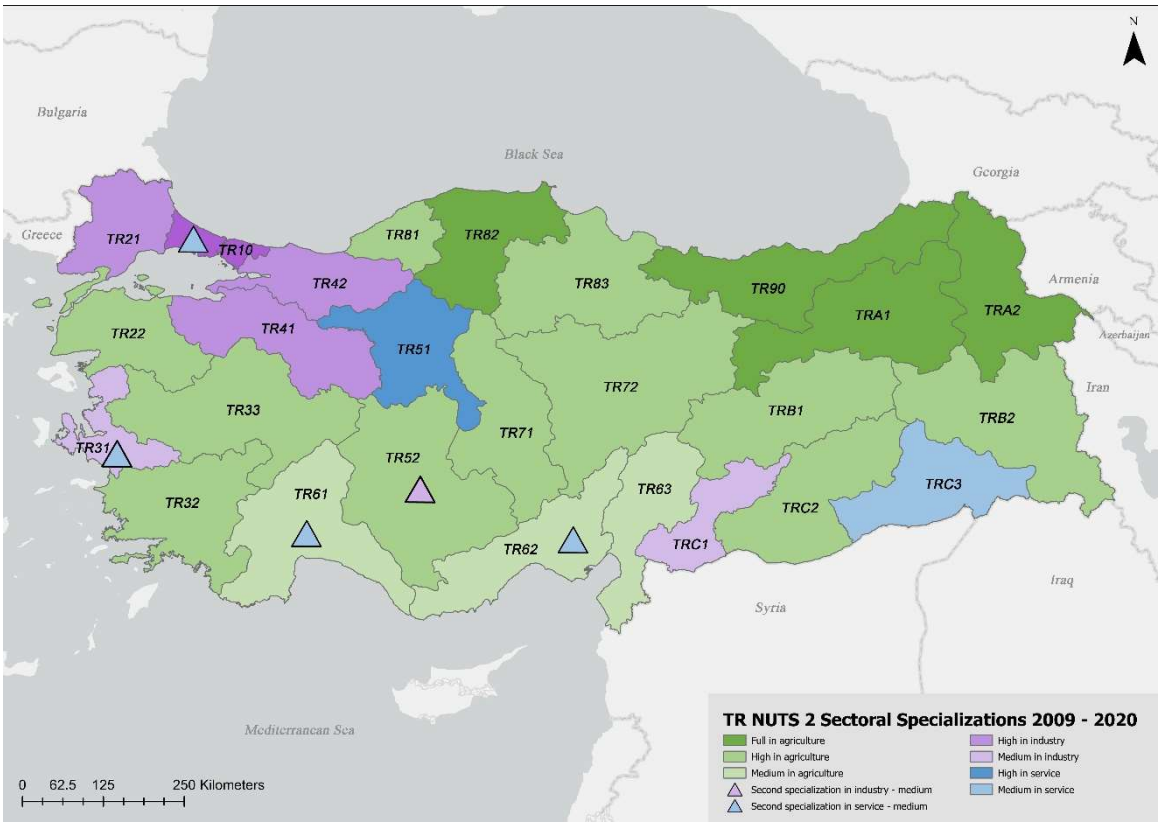
1.00-1.25 = Medium specialization

LQ≥1.00 = Specialization

A long time period was determined in the analysis to remove the effect of periodic changes. Post-2000 in Türkiye is the period when deindustrialization began to become institutionalized and gained momentum, an important change point especially after the 2008 financial crisis (See Doğruel and Doğruel 2019; Uzsayılır and Baycan 2023). For this reason, 2009 was taken as the starting date of the analysis, when the effects of deindustrialization started to be reflected in macro indicators and also NACE Rev. 2 started to be processed. The analysis process covers the period before 2021, when it is assumed that the effects of the Covid-19 pandemic had not yet begun to be seen. Accordingly, analysis was carried out for each year in a 12-year period starting from 2009 and including 2020, and the average value was taken.

Raw data were obtained from TURKSTAT database. Using the data set, first (ei/en) and (Eİ/En) were calculated and then [(ei/en) /(Ei/En)] was found. The obtained data were transferred to the GIS (ArcGIS) program and mapped (Map 1).

Fig. 1: Türkiye NUTS 2 Sectoral Specializations 2009-2020
(Produced within this Study)



3.3. Key Findings

The results of the analysis show that agriculture is the dominant production in Türkiye. 18 out of 26 NUTS-2 regions (TRA2, TR90, TR82, TRA1, TR83, TRB2, TR33, TR81, TRB1, TRC2, TR71, TR22, TR32, TR72, TR52, TR63, TR61, TR62) have specialization in the agricultural sector. Among these, three regions (TR52, TR61, TR62) specialize in a second sector, while the other 15 specialize only in agriculture. Of the 3 regions in question, TR52 specializes in agriculture and industry. This relatively successful region is one of the "Anatolian Tigers" of Central Anatolia whose industrial development has been supported since the 80s. However, industrial specialization has reached a limit and has not progressed at the expected level. TR61 and TR62 specialize in agriculture and services. These two regions are regions with fertile agricultural lands on the southern coasts of Türkiye where agriculture and especially agriculture-industry development potential is high. However, these two regions, which include the port cities (Antalya, Mersin, Adana) in the South, also have high trade and tourism potential, and with the focus on these, the problem of direct transition from agriculture to services has begun to be seen concretely in these regions.

There are seven regions (TR41, TR21, TR42, TR10, TR31, TRC1, TR52) with industrial specialization in Türkiye. Four of them have high specialization (TR41, TR21, TR42, TR10). These clustered regions are Istanbul-centered, with Istanbul (TR10) being the deindustrialized centre among them. Specialization (LQ) in the industrial sector in Istanbul was 1.49 in 2009 and had dropped to 1.19 by 2020.

3.4. Special Situation of Istanbul

Istanbul city-region accounts for 18.66% of the total country population, 30.73% of the total GDP and 20% of the total employment over the age of 15 (TURKSTAT 2019). According to export figures, 50.79% of Türkiye's exports occur from the TR10-Istanbul region (Türkiye Ministry of Commerce 2021).

TR10 Istanbul region borders TR42 to the east and TR21 to the west. Both regions are regions of high specialization (agglomeration) in industry and are united with Istanbul as regions where the decentralization of industry takes place. Istanbul industry, together with these two neighboring regions, interacts with TR41, which shows the highest industrial specialization in this sub-region of Türkiye. Within this cluster, only Istanbul is deindustrializing and is specialized in the service sector along with high industrial specialization (Industry LQ=1.33, Service LQ=1.23).

Istanbul was the imperial capital for centuries and has become a "culturally global city" (See Keyder 2018), connecting the Asian and European continents. The industrialization phase in the 1960s was the city's first modern period, the second being the radical deindustrialization phase up to the 2000s, a two-step process by which Istanbul rapidly integrated with the global economic system.

In the development plans (See Türkiye Presidency 2024) after 2000, attention was drawn to the services sector, the "transit" position that can be advantageous against global flows, and Istanbul and its surrounding regions in global integration.

The new global political economy has gradually changed the national economy, and the manufacturing-based economy has diminished and been replaced by a service sector expansion, mainly centered on Istanbul. Istanbul's industrial transformation began in the late 1970s with decline in productivity, labor movements, and the rapid transition to a free market economy in the 1980s, with the decline in competitiveness. Starting from the 90s, with the application of planning decisions, major industry and therefore the industrial workforce began to be transferred from the center to the periphery. Under the pressure of the new political economy, a series of decisions were implemented to make room for the financial economy instead of decreasing production and for new urban classes to replace the working class. As industries have changed places, some have closed (e.g. leather and textiles), some have shrunk, especially in terms of employment with the introduction of technologies (e.g., automotive, machinery), and some have transferred to foreign capital and/or been incorporated (e.g., pharmaceutical companies).

Under these conditions, an urban transformation policy has begun to be implemented, starting from the lands of large industrial facilities that were closed and/or downsized and

moved to the periphery, and the old workers' neighborhoods around these lands, spreading throughout the city. Especially since the 2000s, the construction sector has become more profitable than production and the preferences of industrialists have begun to move in this direction. Therefore, it can be argued that the global political economy impact related to the form of deindustrialization seen in Istanbul in particular and in Türkiye in general has more spatial characteristics locally.

4. Conclusion

The dynamics of deindustrialization in Türkiye are the rapid transition from an agricultural society to a free market economy and the interruption of industrial development. This situation depends on the center-periphery relationship on a global scale. Productivity-related deindustrialization in developed countries, on the other hand, has created an industrialization effect in emerging economies. Countries outside this two-polar development have also begun to deindustrialize along with developed economies, but with different causes and consequences. The fact that deindustrialization began to occur in Türkiye while industrial development was still continuing can be associated with premature deindustrialization and negative deindustrialization theses in the literature.

However, the situation to which the newly emerged deindustrialization and its derivative definitions correspond should be considered as a continuity within modern industrial development beyond the definitions. Deindustrialization in Türkiye should be viewed as part of the development problem that started with the dissolution of traditional regional specializations from the 17th century as they confronted the changes brought by modern industry. Throughout this process, the development of Istanbul followed a different path from Türkiye in general, and this difference became radical during the deindustrialization period in the 21st century.

While deindustrialization at the international level means the change of industrial geography and the global restructuring of labor, there is a reproduction of this situation at the country level. The results of the study coincide with the views of Krugman (1991:484), who introduced the center-periphery relationship by asking "why and when does manufacturing become concentrated in a few regions, leaving others relatively undeveloped?"

According to the analysis results, the counterpart of the global center-periphery relationship is a cluster centered on Istanbul on the national level. While Istanbul is deindustrializing, its surrounding regions are industrializing. Secondly, industrial development in Anatolia is stagnant and there is a tendency to shift from agriculture directly to services.

For the whole of Anatolia, it is the interruption of industrial development rather than deindustrialization. Because, for deindustrialization to occur in a place, there must be high industrial development. In this sense, the region that can talk about deindustrialization in Türkiye is Istanbul. The deindustrialization of Istanbul and the regional clustering based on the industrialization of the periphery regions has affected Anatolia. Türkiye's sudden transition to a free market economy in 1980s, while its industrial development was still in progress, has weakened regional specializations in international competitiveness, but brought Istanbul and its periphery to the fore in integration with the global system.

The new political economy has gradually changed the Turkish economy, and the manufacturing economy has started to give way to an economy that is dependent on the service sector such as real estate, finance, insurance and banking, mainly through Istanbul. It can be argued that the deindustrialization of Istanbul is a transformation that takes place over its geographies and changes the macroeconomic indicators as a result of the integration relationship with its sub-regions. The basis of the industrial transformation in Istanbul is the city-regionalization process reflecting the new regionalism of a neoliberal political economy and a series of parallel administrative and legal regulations.

If it is necessary to make recommendations for avoiding deindustrialization, this can only be done through the realization of regional industrial potentials and the development of international cooperation and trade. Socioeconomic and spatial planning should focus on investigating possibilities specific to Türkiye rather than global models, and on reconsidering

the role of cities and regions in development by prioritizing the necessary industrial infrastructure and market share so that production can develop according to local dynamics.

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PLACE-BASED POLICY RESPONSES TO SPATIAL INEQUALITIES

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Abstract

This paper aims to contribute a review of the recent literature on spatial inequalities at subnational level, building on the main foundations of regional studies and specific preoccupations with this subject. The overview of the literature has sought to derive key trends and to identify current knowledge frontiers and debates. It has been deployed on a comprehensive and systematic research of the relevant sources of the past decades and has been structured into three main parts, namely: (1) basic contributions and recent and state-of-the-art literature, (2) current debates, open issues or questions and (3) policy implications. The undertaken inquiries point to a variety of approaches, from those which bring into the spotlight the 'left-behind places', the 'places that don't matter' (and their revenge), the 'geography of discontent', etc. to those proposing an entire typology for the lagging regions, revealing the interest of both academic community and policy-makers in this subject. The policies gravitate around place-based solutions, which, without neglecting the strongest European regions, aim to support the weaker regions as well. They go beyond simple compensatory measures, concentrating on the turning to good account of the untapped potential of the left-behind places. Moreover, building on the up-to-date findings and useful lessons, the current orientations regarding the future of the Cohesion Policy and the European growth model point to the need of a deeper integration of place-based and people-based approaches, in accordance with the spatial justice desideratum, as well as to the ambition "to bring EU closer to citizens and to leave no one behind" (European Commission, 2023, p.5), in the complex context generated by the ongoing transitions – energy, digital, industrial ones – and COVID-19 recovery.

Keywords: spatial inequalities, European Union, spatial justice, place-based solutions, people-based approaches

JEL classification: R10, R11, R28, R58,

1. Introduction

This paper aims at a critical review of the recent literature on spatial inequalities in Europe in the era of global mega-trends. The overview of the literature is seeking to derive key trends and to identify current knowledge frontiers and debates. The critical analysis is deployed on a comprehensive and systematic review of the relevant literature of the past decades. This review of relevant sources also captures pending or open research questions and, more importantly, policy dilemmas. For the latter dimension, the review of academic literature is triangulated with key publications from international organisations that have covered the key topics under investigation in the field of spatial inequalities (e.g. European Parliament, European Commission, World Bank, OECD, etc.). Finally, it is important to note that this paper focuses on the subnational inequalities dimension. In the following paragraphs the area of study and the main concepts attached to the topic of spatial inequalities are defined and described.

According to Kanbur and Venables (2005), spatial inequality is defined as "inequality in economic and social indicators of wellbeing across geographical units within a country". It is of a major concern for the policy-makers considering that it is a "component of overall national inequality across individuals" and, besides, it requires attention "in and of itself,

especially when the geographical regions align with political, ethnic, language or religious divisions" (p.1).

In the last decades, spatial inequalities have been characterised in reference to disparities and uneven distribution of resources, opportunities, and outcomes across geographical spaces or regions, with a special focus on the links between spatial inequalities and developmental outcomes. Thus, these inequalities can manifest in various aspects, including economic (e.g. income, wealth, employment opportunities, and economic growth across different geographic areas, infrastructure) and social or institutional ones (e.g. access to social services, such as healthcare, education, housing, and public amenities) (Storper, 2018; Rodriguez-Pose, 2018; Neumark and Simpson, 2018; Iammarino et al., 2019; Dijkstra et al., 2020). Increasingly, more attention is also devoted to spatial inequalities that manifest as environmental inequalities (e.g. pollution, lack of green spaces, vulnerability to natural disasters) (e.g. Adebowale, 2008; Pellow and Brulle, 2015; European Environment Agency, 2019). In general terms, the studies devoted to the "geography of inequalities" can be grouped into two categories, namely those dealing with the understanding of the spatial patterns of inequalities and those which concentrate on the effects of spatial inequalities (van Ham et al., 2022).

Spatial inequalities have an intrinsic local territorial dimension, addressed in the last decades in relation to territorial identity (Capello, 2018), territorial capital (Camagni, 2007; Camagni, 2008), etc. As such, when we look at spatial inequalities, we very often end up looking at subnational inequalities. While inequalities between countries can have a spatial dimension, the diversity and heterogeneity within countries makes spatial inequalities often confined to smaller territorial units than national ones. As a consequence, spatial inequalities are usually reflected in regional or urban studies. Both fields contribute to our understanding of spatial phenomena, but they differ in terms of scale and scope of analysis. This paper selects some of the key recent debates in the corresponding literature, in order to focus narrowly on the studies specialised in the issue of inequalities. However, most of the studies that cover regional and urban dimensions inevitably reflect upon certain forms of inequality, even if they do not focus their research questions and research methodology on them.

Going further, in a distinct register we can find the concept of spatial justice. While spatial inequalities focus on the existing disparities across different spatial units, spatial justice is concerned with addressing these disparities and promoting fairness and equity in spatial distribution. The concept of spatial justice challenges the notion that access to resources and opportunities is evenly distributed, and instead focuses on how factors such as location, place, and space influence social and economic outcomes. It will be given a broader space in the next section.

Merging the preoccupation with concepts of spatial inequalities and social justice, recent years have also increasingly reflected on a new concept that showcases subnational inequalities (either regional or urban): just transition. The concept of just transition emerged from the recognition that the shift towards sustainability should not leave certain groups or regions behind or exacerbate existing inequalities (e.g. Sovacool et al., 2018; Jänicke, 2018; Green and Gambhir, 2020). It emphasizes the need to consider the impacts of environmental policies and transitions on workers, communities, and vulnerable groups, and to develop strategies that address their concerns and ensure they are not disproportionately burdened.

Similarly, economic transformations have generated preoccupation with another subfield of regional inequalities: left-behind places or geographies of discontent. The concept of left-behind places is often used in discussions around regional disparities, spatial inequalities, and social exclusion (e.g. Rodríguez-Pose, 2018; Pike et al., 2007). These areas may have experienced the negative impacts of globalization, deindustrialization, or shifts in economic structure that have disproportionately affected certain regions. Essentially, this concept refers to regions or communities that have been neglected or marginalized in terms of economic development, social opportunities, or public investments.

As a result of these key issues reflected in the recent literature on spatial inequalities, a response has emerged in the form of place-based economic policy. While primarily driven by international organisations and national governments, place-based policies are equally reflected in the academic literature (e.g. Neumark and Simpson, 2018; Barca et al., 2012; Austin et al., 2018; Busso et al., 2013; Kline and Moretti, 2014). Essentially, place-based policies aim to approach spatial disparities by addressing specific local characteristics of

places—be they regions or cities, and foster positive change and improve the quality of life for the people living in those areas (i.e. "place-aware" interventions). Moreover, many studies go further and suggest an integration of the place-based and people-based approaches (e.g. Barca et al., 2012) as well as policies connecting people with places (van Ham et al., 2022). They can be also interpreted as a reaction to the criticism of the previous assessment of EU Cohesion policy on the basis of convergence criteria alone, unable to capture the socio-economic objectives and to strengthen the institutional and learning behaviour (Rodriguez-Pose and Fratesi, 2004; Barca, 2009; Barca et al., 2012).

2. Basic contributions and recent and state-of-the-art literature

Aiming to produce a well-founded report, we have used an automatic bibliographic search engine (i.e. Publish or Perish) and have extracted from the Google Scholar database the 1,000 bibliographic references that were the most relevant to the search terms 'spatial inequality', 'regional inequalities', etc. between 2015 and 2023. Out of the total list, we have selected a subsample of 118 articles and books based on a qualitative triage on topical relevance, methodology, and quotations. After a careful consideration, we have retained a list of papers showcasing three categories of studies for our ongoing ESSPIN project bibliographic record, namely: spatial inequalities theory and datasets; inequality and market interventions; current challenges and inequalities (i.e. technology, green transition, COVID). In addition, several other papers have been explored for a deeper approach of these issues. We have reviewed the academic literature with an interest to discern the main theories, trends, measures, drivers and limitations pertaining to subnational inequalities in the past two decades. Further on, relevant comments have been added in relation to the research findings of previous Horizon 2020 projects (e.g. RELOCAL, IMAJINE), which addressed regional inequalities from perspectives complementary to ESSPIN. We develop in the following paragraphs an account on these recent contributions and their key ideas.

Contrary to mainstream economists who prioritize growth over distribution, disregarding the consequences of concentrated wealth in the hands of a few, Savage (2021) highlights the detrimental effects of severe economic inequalities. These inequalities amplify social, cultural, and political conflicts and undermine the foundations of liberal democracy, reintroducing burdens from the past. Savage's argument is closely related to Piketty and Saez's (2003) U-shaped curve, which demonstrates that income inequalities have returned to levels seen a century ago after a period of improvement. While the U-curve refers specifically to the US, Savage discusses the general case and argues that it may also be applied to other contexts.

In another register, McCann (2020) examines the concept of the 'geography of discontent' by investigating perceptions of regional inequalities and exploring whether the UK and other countries exhibit high or average levels of interregional inequality. The study considers 28 different indicators across 30 OECD countries and examines various measures of prosperity and inequality to understand interregional inequality. GDP per capita and Gross Value Added (GVA) per worker are used to measure regional inequalities at different territorial levels. The analysis also incorporates Regional Disposable Income (RDI), which captures wage/salary income at the residence location. The study compares the UK's performance in these measures with other countries and demonstrates the UK's interregional inequality in terms of GDP per capita, GVA per worker, and RDI. The research reveals that major differences in local productivity contribute to the 'geography of discontent', posing challenges to a country's institutional and governance structures. Intra-regional and intra-urban inequalities are also highlighted, emphasizing the interconnection between different dimensions of inequality.

The first exercise employed GDP per capita and measured regional inequalities at TL2 and TL3 (TL = Territorial Level according to OECD classification (see OECD, 2022)) in five different ways, namely (McCann, 2020):

1. GDP per capita of the highest region divided by the GDP per capita in the lowest region.
2. The absolute difference of the GDP per capita of the highest and lowest regions divided by the average GDP per capita for the whole country.

3. The GDP per capita of the 10% highest regions divided by the GDP per capita of the 10% lowest regions.
4. The GDP per capita of the 20% highest regions divided by the GDP per capita of the 20% lowest regions.
5. The Gini coefficient of inequality across all regions.

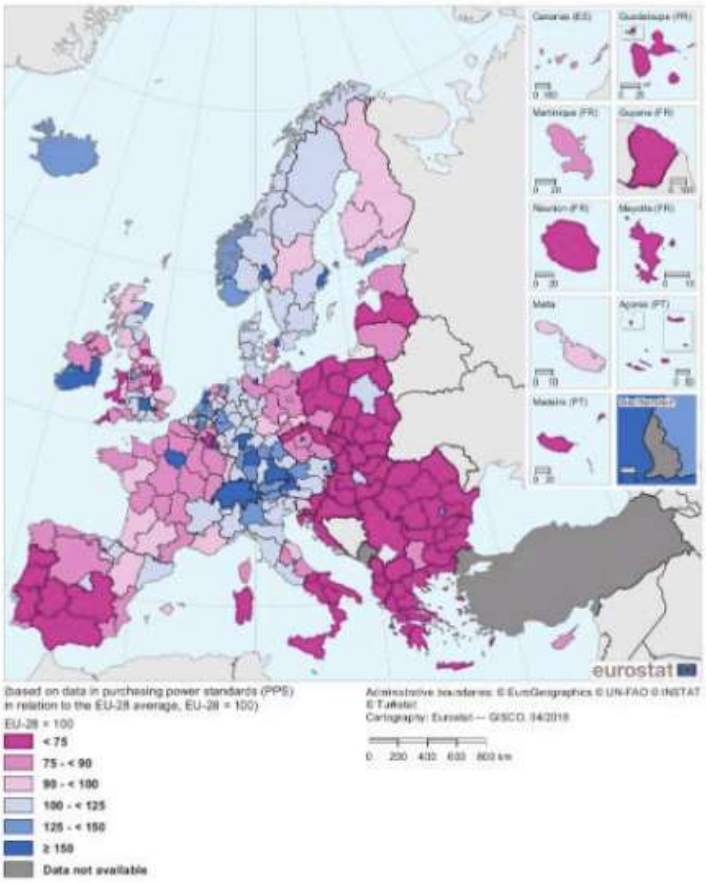
The same exercise was applied for GVA (Gross Value Added) per worker, as McCann, like Krugman (1994), embraces the idea that "The patterns of regional productivity underpin national productivity and the links between people's lived experiences and political responses depend crucially on local productivity as the key driver of local prosperity" (McCann, 2020, p.257). These calculations have been also made by means of Regional Disposable Income (RDI), considering the supplementary information it can bring about, since it measures the people's wage/salary income at the residence location, unlike the workplace location as in the case of GDP and GVA. Finally, this analysis was replicated for the Eurostat's NUTS-2 and NUTS-3 regions. The results have indicated that, in terms of the highest and lowest GDP per capita NUTS-2 regions, ranks behind Ireland, Germany, Italy, Slovakia and Hungary, on the 6th place, out of 22 countries. The same situation is recorded for the NUTS-3 level. When the GDP per capita ratio between the highest 10% and the lowest 10% NUTS-2 regions is considered, UK displays higher values than all Western European countries except Ireland, whereas Hungary and Slovakia have higher ratios than the UK. Broadly, this pattern is similar to the GVA per worker at TL2 level, while at TL3 the UK appears as the second most inter-regionally unequal economy, only the small former communist countries being more unequal than the UK. For the same ratio, in terms of RDI at TL2 level the UK ranks 4th – the same like in the case of the ratio between the highest and lowest 20% regions, with only Slovakia, Italy and Spain being more unequal.

An alternative spatial approach aiming to measure subnational inequalities has been proposed by Smith and Rey (2018), who applied a spatial decomposition of the Gini coefficient for 93 countries so as to obtain cross-sectional variation. The results showed "improvement, decline and persistent clustering of subnational level inequality" (p. O657) and are considered useful in terms of measuring the Sustainable Development Goals of the United Nations as well.

In the EU-centred evaluations, the S80/20 ratio and Gini coefficient are employed. The S80/20 ratio is used for the measurement of inequalities reflected by the social scoreboard which accompanies the European Pillar of Social Rights, while the Gini coefficient is a measure of income inequality applied at larger international scale. Going deeper, even if the EU Cohesion Policy envisages a comprehensive approach, which incorporates economic, social and territorial cohesion, the reduction of territorial inequalities has mainly focused on the convergence of regional levels of GDP per capita in relation to the EU average. Figure 1 reflects the situation in 2016, a highly relevant year considering that it is both the final year for the implementation of the 2007-2013 Cohesion Policy and the final year of the 2007-2016 period, which witnessed the financial and economic crisis in Europe (EPRS, 2019).

Usually, in terms of convergence among the EU regions, two processes are explored, namely beta- and sigma convergence. Beta-convergence reflects the catching-up process, i.e. lagging behind regions grow faster than the developed ones, whereas sigma-convergence mirrors the decrease in the disparities between regions over time. It is considered that the latter is "more revealing in terms of describing the distribution of income across economies" (EPRS, 2019, p. 4). As summarised by Goschin (2017) "…sigma and beta convergence are interrelated. Sigma convergence implies beta convergence, but the reverse does not necessarily hold, as beta convergence, although required, it is insufficient to produce sigma convergence (Bongardt et al., 2013). This is because beta convergence may occur without reducing the GDP dispersion (Wodon and Yitzhaki, 2005). It happens when economic shocks, affecting stronger certain regions, maintain or increase the initial dispersion (Barro and Salai-Martin, 1995)" (p.131).

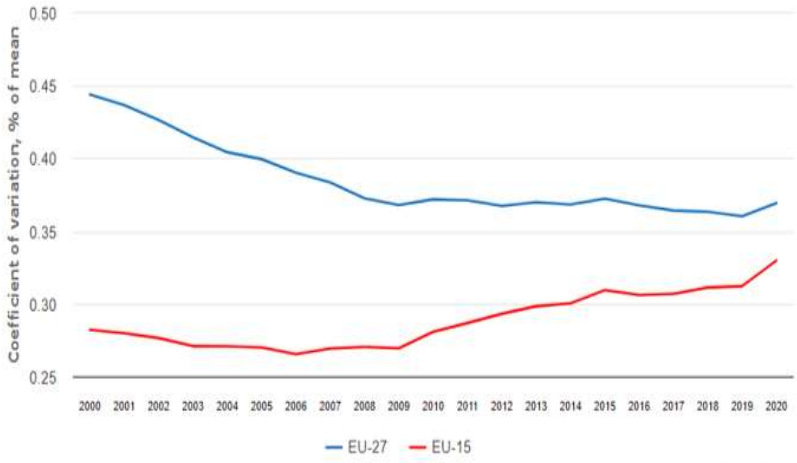
Figure 1: GDP per capita (PPS) relative to the EU average, 2016



Source: Eurostat (2019)

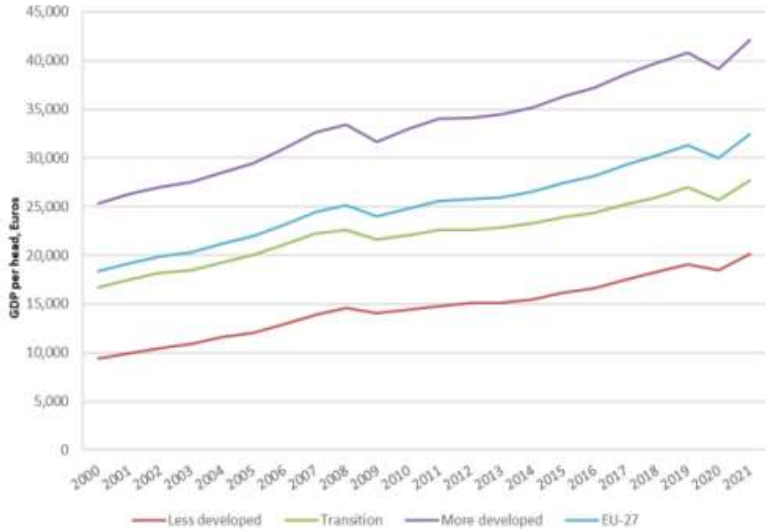
In empirical analysis terms, a noteworthy remark has been made by Monfort (2020), who pointed out that, even if before the economic and financial crisis the EU used to be named "the convergence machine" (p.1), the impact of the crisis was so strong that, despite a sustained recovery, the convergence within the EU stopped and since 2008 the disparities are more or less stable. Moreover, within many Member States, disparities are increasing. This conclusion is supported by the Figures 2, 3 and 4 for the EU as a whole, while Figure 5 presents the situation of regional disparities for several countries in 2021 compared to 2019 (the year before the covid-19 crisis started). It can be noticed that, whereas in several countries the regional disparities slightly decreased at the EU level the coefficient of variation by NUTS 2 region increased.

Figure 2: Regional disparities (NUTS2) in terms of GDP per capita (PPS), 2000-2020



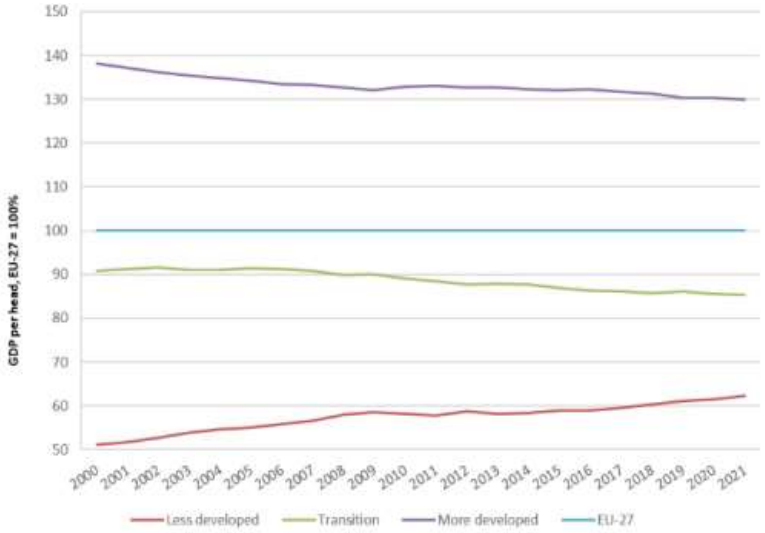
Source: Monfort (2020), based on Eurostat and REGIO calculations

Figure 3: GDP per capita (PPS) in less developed, transition and more developed NUTS regions, 2000-2021 (absolute terms)



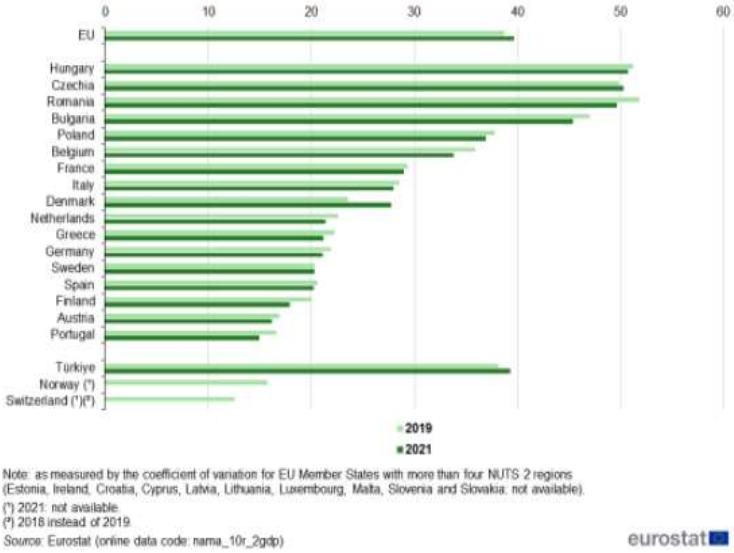
Source: European Commission (2023), based on Eurostat and REGIO calculations

Figure 4: GDP per capita (PPS) in less developed, transition and more developed NUTS regions, 2000-2021 (relative to EU average)



Source: European Commission (2023), based on Eurostat and REGIO calculations

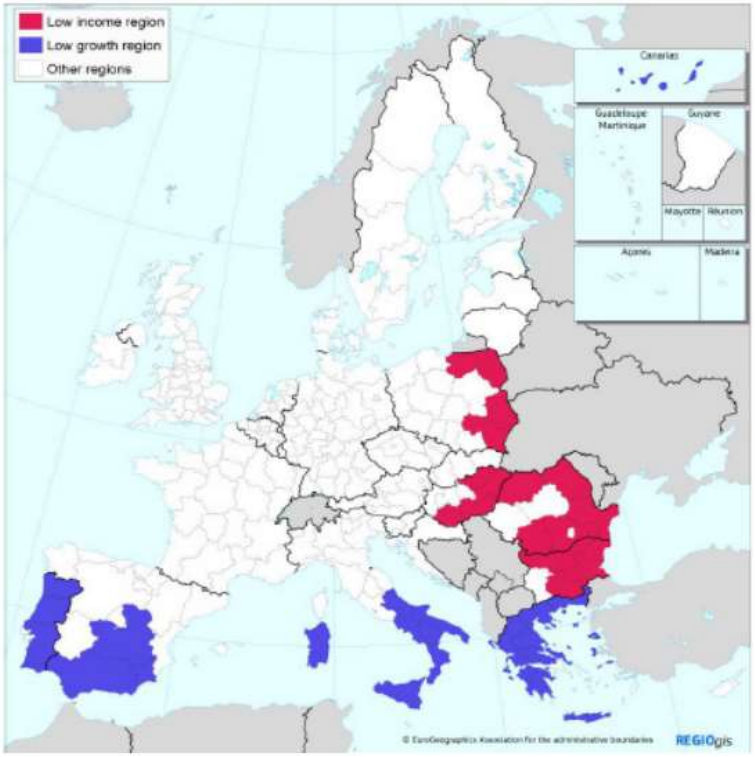
Figure 5: Regional inequalities in GDP per capita, 2019 and 2021 (coefficient of variantion (%) by NUTS region)



When it comes to the EU new member states, Artelaris et al. (2010) applied non-linear econometric models transcending "the 'all or nothing' logic behind conventional convergence analysis", which indicated the existence of regional convergence clubs in many of these countries. The identification of such clubs pointed out "the heterogenous impact of the EU economic integration process" (p. 113).

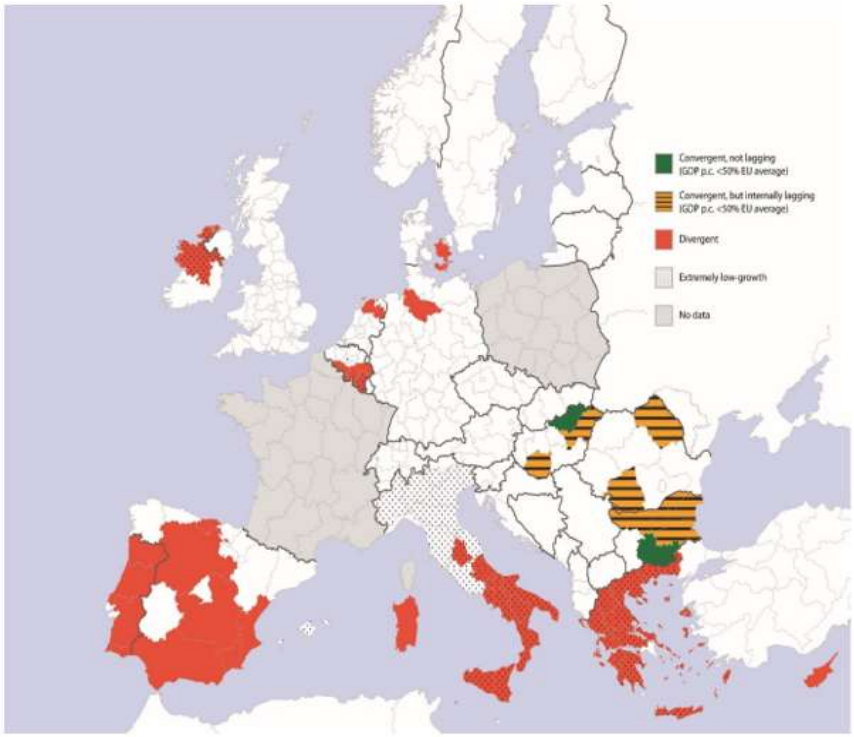
In the given context, a particular emphasis has been placed on the EU's lagging regions, especially the most left behind regions – targeted by the Lagging Regions Initiative (2015), followed by the Catching-Up Regions Initiative (2018) (European Parliament, 2020). Thus, initially the left behind regions were divided into two types, namely low-income regions, with a GDP per head less than 50% of the EU average (most of them being found in Poland, Hungary, Romania and Bulgaria) and low-growth regions, with a GDP per head less than 90% of the EU average (most of them located in Portugal, Spain, Italy and Greece) (Figure 6). Further on, a new typology for lagging regions has been proposed, comprising internally lagging regions (they converge to the EU GDP per head average but diverge from the national average), divergent regions (poorer regions that do not converge to the EU average) and extremely low-growth regions (which experience growth rates lower than half of the EU average growth since 2000) (Figure 7).

Figure 6: The EU's lagging regions – Lagging Regions Initiative



Source: European Parliament (2020), based on Eurostat (2017)

Figure 7: Revised lagging regions typology



Source: European Parliament (2020), based on Eurostat (2017)

Moreover, apart from the convergence-based perspective, multi-dimensional approaches to inequalities are more and more envisaged so as to capture the variety of their underlying factors and to propose adequate solutions. Thus, reacting to the "Beyond GDP debate", multiple aspects of inequalities within the EU are revealed by Social Progress Index (which focuses on basic human needs, foundations of wellbeing, opportunity), Regional Competitiveness Index (which concentrates on ('Institutions', 'Macroeconomic stability', 'Infrastructures', 'Health', 'Basic education', 'Higher education, training and lifelong learning', 'Labour-market efficiency', 'Market size', 'Technological readiness', 'Business sophistication' and 'innovation') and EU Quality of Government Index (which captures average citizens' perceptions and experiences with corruption, quality and impartiality of three essential public services – health, education and policing - in their region of residence) (EPRS, 2019).

As a result, in terms of policy responses, more emphasis is required on turning to good account the diversity of places, solidarity, inclusion and public service provision, subsidiarity, interplay between territorial and sectoral policies, etc. (TA2030, 2020), aiming at "a renewed cohesion understanding and an active implementation of it" (Böhme and Redlich, 2023, p. 729).

The facts revealed by the empirical analyses are relevant for explaining and understanding the 'geography of discontent'. One of its primary sources consists in the major differences in local productivity, which also represent "a challenge to country's institutional and governance structures" (McCann, 2020, p.264). It has been demonstrated that countries with decentralised governance systems display "more interregionally equal growth patterns (…), less dominance by an individual city-region (…) and no effect on national growth (…)", the huge imbalances recorded by the UK being associated with its "over-centralized national governance system" (McCann, 2020, p. 264). It is also underlined that intra-regional and intra-urban inequalities are noticed even in the countries with low inter-regional inequalities, but higher inter-regional inequalities are associated with higher interpersonal inequalities at the national scale, so that "these two dimensions of inequality cannot be separated" (McCann, 2020, p. 257). Moreover, "most people's perceptions of their prosperity and quality of life depends crucially not only on the productivity of the region in which they live and work but also on their awareness of the experiences of other regions" (McCann, 2020, p.257), which is influenced by both social media and – very important – by personal experience, which is strengthened by geographical proximity. In addition, the research undertaken by Lenzi and Perruca (2021) reveal that

"intraregional inequalities do matter for individual discontent, and individual socioeconomic disadvantage conditions amplify further this negative effect" (p. 415).

Dijkstra et al. (2020) focus on the 'geography of discontent' in relation to growing support for parties opposing EU integration. They highlight the role of geographical factors, particularly in stagnating and low-productivity regions such as rural areas and small to medium-sized cities. These regions face challenges like job losses, declining labour force participation, and lower per capita income compared to the national average. The authors use an econometric model to map the geography of discontent across electoral districts in the EU-28 and identify factors contributing to the rejection of European integration. Low education levels, limited employment opportunities, and historical reliance on manufacturing play significant roles. However, the study also finds that wealthier places tend to be more opposed to European integration once education, employment opportunities, and economic and industrial changes are taken into account. The authors propose addressing these challenges by implementing place-sensitive policies that tap into the economic potential of less-developed regions and provide real opportunities to tackle neglect and decline.

The discontent determined by the feeling of being 'left behind' is expressed in the ballot-box, as "the revenge of places that don't matter": "The areas left behind, those having witnessed long periods of decline, migration and brain drain, those that have seen better times and remember them with nostalgia, those that have been repeatedly told that the future lays elsewhere, have used the ballot box as their weapon to vent their anger against the establishment" (Rodríguez-Pose, 2018, p.200). Moreover, the long-term nature of the 'left behind' places is accompanied by "the interaction of spatial inequality with intergenerational inequality", many areas remaining deprived across multiple generations (CEPR, 2022, p.1).

In addition, given that economic concentration effects started to be linked to growing urban agglomerations, Rodriguez-Pose (2018) underlies the "persistent poverty, economic decay and lack of opportunities" (p. 189) that encircle rural or less connected areas. As these regions become hotbeds of disenchantment and revolt, studies are further linking the diagnostic of drivers of regional or subnational disparities to place-based economic policies in United States (e.g. MacKinnon et al., 2022; Glaeser and Gottlieb, 2019; Austin et al., 2018), United Kingdom (Martin et al., 2019), or France (Fourquet, 2019).

As suggestions for addressing this so sensitive issue, Dijkstra et al. (2020) consider that "fixing the so-called places that don't matter is possibly one of the best ways to start" (p.751). This points to "policies that go beyond fundamentally targeting, as has often been the case until now, either the more developed and often dynamic large cities or simply the least developed regions" and, at the same time, to policies that go "beyond simple compensatory and/or appeasement measures" (p.751). This implies "tapping into the often overlooked economic potential" of the left behind places and "providing real opportunities to tackle neglect and decline" (p.751). According to Iammarino et al. (2019) 'place-sensitive policies' may be the best response to address the problems at the core of the geography of discontent and, at the same time, to cease and revert the ascent of the anti-establishment voting.

Also named 'place-sensitive distributed development policy' (Iammarino et al., 2017) this approach does not neglect the strongest European regions but also aims at supporting the weaker ones. It has come as an alternative to the mainstream and heterodox theories, which have not succeeded to explain the existence of the different economic clubs of regions – with their challenges and opportunities - and the weaknesses of processes of convergence among them.

Building on the literature on 'left-behind places', Martin (2015) looks at the high reliance of national economies on a few leading cities, implicitly accepting poor territorial distribution of opportunities across the country. Martin (2015) uses the case study of the UK, as he discusses the need for spatial re-balancing of the UK's economy to reduce its dependence on London and the South-East cities. The paper highlights the spatial economic imbalance that persisted for many years and argues that existing theories of regional development and policy, such as spatial economics and regional studies, are insufficient for devising effective policies to address this imbalance. Martin suggests the need for new approaches that go beyond targeting only the most developed or least developed regions and focus on powering up northern cities to achieve spatial re-balancing.

The current debates on the balanced territorial development bring into spotlight the territories and their people – in other words place-based and people-based approaches, offering a solid background for the idea of 'spatial justice'. Spatial justice, defined as "the fair and equitable distribution in space of socially valued resources and opportunities to use them" (Soja, 2009, p.2) is mostly associated with the research done by Soja (Soja, 2009; Soja, 2010) who has built on the works of predecessors like Davies, 1968; Lefebvre, 1968; Lefebvre, 1972; Harvey, 1973, and others. In other words, spatial justice links social justice to space and the three key dimensions which distinguish it from social justice are "spatiality, which draws attention to spatial aspects of justice; integration of distributive and procedural justice, which goes beyond this controversial dichotomy in social justice; and inclusion, which crosses the boundaries and addresses both inter-regional and intra-regional inequality" (Madanipour et al,, 2022, p.307). It opens the door to broader development policies models, with open-ended spatial boundaries (Constantin, 2021), which "respond to the functional needs of places at different territorial scales, not pre-defined on the basis of political or administrative borders" (Mendez, 2011, p. 12). Such models can be considered a response to the criticism of the 'one-size-fits-all' policy, which "does serious injustice" to the uneven development of various territories (Birch, 2017, p.129) as well as to the 'statistical condition' for territorial justice, which shows that it depends on "the dimensions of needs and provisions that are compared" (Boyne and Powell, 1991, p. 263).

According to IMAJINE (2022), "…there is not one single ideal of 'spatial justice' that can provide a normative model for future cohesion policy in Europe. Rather, individual perceptions of spatial justice place differing weight on economic equality, broader social and environmental wellbeing, inter-regional solidarity and redistribution, and territorial autonomy, producing visions of the future that are not always compatible. EU institutions, national governments and civil society need to engage with these contrasting priorities and promote public debate on the form of spatial justice that citizens want to shape Europe's future" (p.3).

In the last decade the need to move 'beyond GDP' has been stressed, requiring to extend the focus in order to include the 'social dimension of regional disparities' at the same time with the increase of the geographical granularity, by extending the scope of the databases to NUTS3 level and even lower level, for 'zooming in' on territorial specificities (RELOCAL, 2018). In this way, favourable conditions for addressing territorial inequalities through the lens of spatial justice are created.

The studies concentrating on local administrative units (LAU) - LAU1, LAU2 (until 2016, then LAU), and microdata offer a more detailed view on the 'inside' of overall regional disparities as well as on certain, well-targeted aspects of these disparities (such as Structural Funds allocation, territorial profile of public expenditures, impact of road investment on accessibility, mobility patterns, etc.), creating the necessary basis for more accurate policy measures, based on integrated approaches (Constantin, 2021). In other words, the diversity of disparity patterns revealed at lower levels of disaggregation lay a more robust foundation for "differentiated decisions regarding the use of the EU structural funding, with direct implications on the results of the financial assistance process" (Constantin, 2021, p.326). Moreover, they can help preventing governments from directing "more resources to relatively better-off and politically dominant regions" and, thus, "reinforcing spatial inequalities" (Abdulai, 2017, p.386). In addition, the heterogeneity of impacts of the EU structural assistance must be also considered. Pappa and Canova (2021) demonstrate that even if all funds contribute to job creation and economic recovery, the European Regional Development Fund has more short-term direct effects, whereas the European Social Fund has more medium- to long-term indirect effects. Moreover, there is significant regional heterogeneity in impacts, driven by location, level of development, EU tenure, and euro area membership.

In line with the orientations of increasing the geographical granularity, the European Commission and the World Bank, in cooperation with the EU member states launched a poverty mapping project which provided a set of high-resolution poverty maps for small geographical areas in the EU countries (at NUTS3 level or lower level) by means of the information provided by national population censuses and household income surveys (World Bank, 2012). It was based on the previous World Bank-funded research undertaken by Elbers et al. (2003), who proposed a set of area homogeneity assumptions necessary for poverty mapping in order to offer adequate estimates for small areas. The better measuring of

territorial inequalities at local level proved to be useful for the targeting of development assistance as well as for decentralisation of spending decisions. At the same time, the local level analyses prove to be very useful when it comes to territories with specific characteristics. In a broader framework, the estimated disaggregated data and those provided by Eurostat have served for multi-scale evaluations of the territorial inequalities, from locality to region and state level, considering their political implications in the discussions on territorial cohesion (IMAJINE, 2017).

As an overarching conclusion with regard to the use of microdata, the lessons learned from poverty mapping in the European Union performed by the World Bank can be mentioned: the regional development agenda is a useful source of primary information for estimating small area poverty; the institutional barriers can be reduced if pre-existing arrangements are involved; project outcomes and sustainability are positively impacted by strategic engagement across institutions and across countries; one size does not fit all cases (Simler, 2016).

Wei (2015) has reviewed the literature on regional inequalities concentrating on the spatiality of economic/income inequalities so as to contribute to a better understanding of their complexity and dynamics. He points to the fact that "existing theories disagree over temporal trends and underlying forces of regional inequality, and spatio-temporal models have been favored by economic geographers" (p.1). Thus, the neoclassical convergence model demonstrates that efficient markets and factor mobility tend to equalize regional differentials. Then, the inverted-U model shows that regional inequalities increase in the early stages of development, decreasing when the economy becomes a mature one. Finally, the divergence and structural models underline as source of divergence the asymmetries in productive performance.

Fanti et al. (2023) have taken an alternative route bringing into discussion the complex system approach and agent-based modelling. Thus, they have evaluated a particular source of divergence, namely "the different (de)regulation level of the labour markets acting as a first order channel fuelling, in turn, the productive performance divergence" (p.409). In the empirical register, focused in regional inequalities in Italy, they highlighted that the concentration of temporary and part-time contracts, the reduction in working hours, and the wage stagnation have been more noticeable in Southern Italian regions, although transformations in labour-market institutions can be observed in the entire Italy.

Starting from the largely acknowledged finding that the debates about urban growth and change are usually centred on specialization, Kemeny and Storper (2015) notice that "arguments linking specialization to metropolitan economic development contain diverse, and sometimes conflicting, claims" (p.1003). They raise and seek answers to the following questions: "Is it better to be highly specialized or diversified? Does specialization refer to the absolute or relative scale of an activity in a region? Does specialization have static or evolutionary effects?" (p. 1003), which are investigated in theoretical and empirical terms. The analysis of local agglomerations over time highlights that "growing absolute specialization is positively linked to wages, while changes in relative concentration are not significantly associated with wage dynamics" (p. 1003).

While, at global scale, it is largely acknowledged that "the concentration of economic activity is inevitable and usually desirable for economic growth", the usually resulted "large spatial disparities in welfare levels that accompany this concentration" (World Bank, 2009, pp. i-ii) are viewed differently, pointing to the need to keep these disparities in reasonable intervals of variation.

Based on the empirical evidence from Greece, Giannakis and Bruggeman (2017) apply shift-share and input-output models to analyse regions' resilience to economic crisis. The results indicate that rural regions are more resistant to recession-induced shocks than urban regions. When economic sectors are considered, agriculture appears as highly resilient, whereas food industry recorded increase in employment in seven out of thirteen regions, proving a decline of crisis impact over time. Overall, tourism contracted, but at regional scale the situation varies from continental regions, more affected, to island regions, more resilient. The main conclusion is that "The spatial heterogeneity in the effects of the recessionary shocks re-emphasizes the need for targeted and differentiated regional development policies" (p. 451).

Last but not the least, the statistical analysis of spatial data requires a specially designed collection of tools and approaches. They have evolved from Exploratory Data Analysis (EDA) to Exploratory Spatial Data Analysis (ESDA) and Exploratory Spatial Temporal Data Analysis (ESTDA) (See, 2021). As geographical phenomena may be correlated over space, traditional statistical models (e.g. regression) cannot be employed because they accept the assumption of independence between variables. Therefore various tests have been proposed to check whether spatial autocorrelation exists, such as Moran's I, Geary's c, variograms, Ripley's K function, etc. (Getis, 2010). Local versions of these statistics have been proposed as well, such as local Moran's I and Local Indicators of Spatial Association (LISA), which are useful tools for identifying hotspots in area-based data. Further on, the data mining process is applied when the discovery of patterns in large datasets is required, involving methods, techniques and algorithms at the intersection of statistics, artificial intelligence, machine learning and database systems (Cheng et al., 2021).

3. Current debates, open issues

Some of the largest debates in the academic literature on subnational inequalities cover the deepening cleavage lines in our societies—derived from the economic modes of production and environmental changes (i.e., just transition and spatial justice), derived from the internal migration of the population (i.e., urban-rural divides), derived from the administrative and political choices (i.e., local governance capacity).

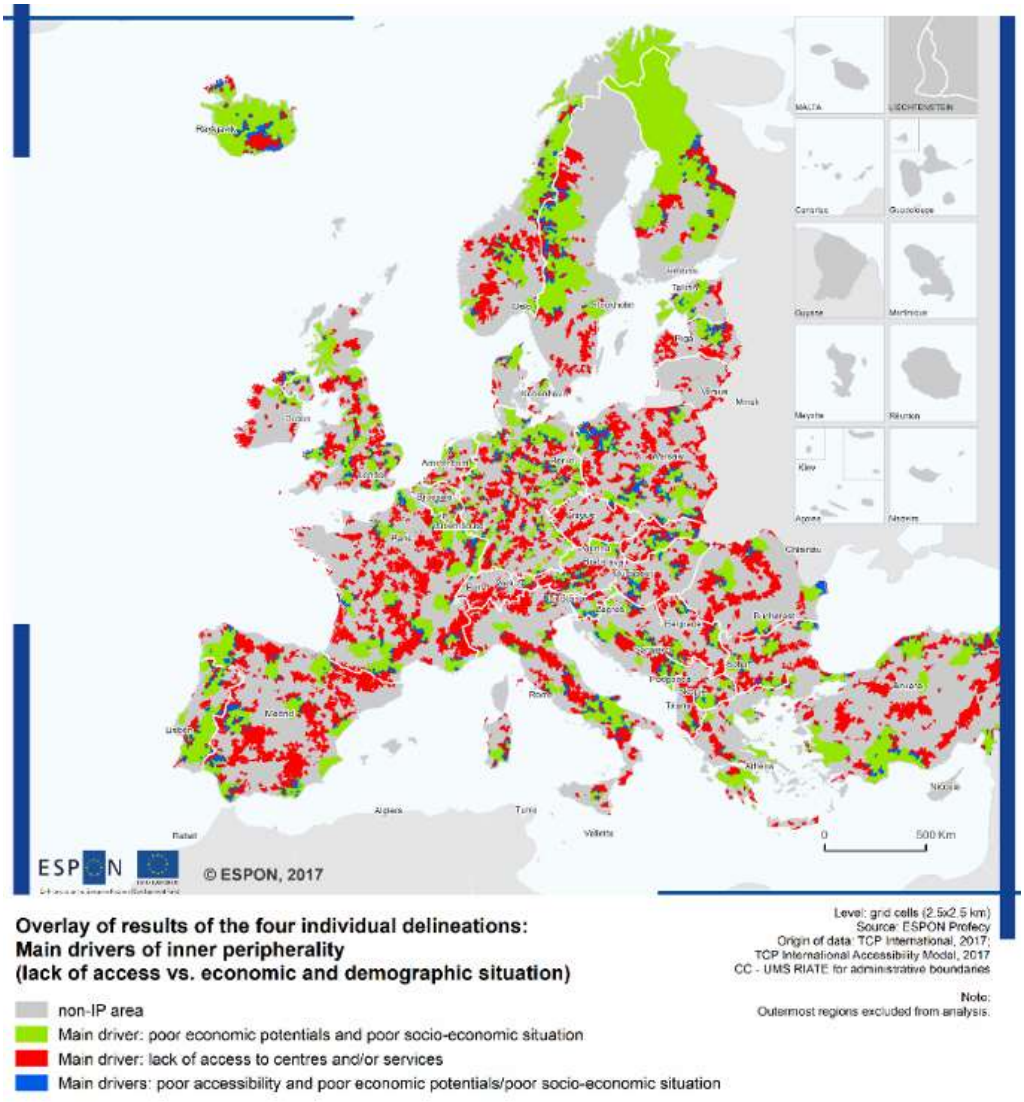
Thus, in reaction to the large territorial impact of the changes in the industrial geography and modes of production, there is an increasingly large conversation in the academic and policy literature around the just transition or spatial justice. Spatial justice literature highlights the unequal distribution of resources and opportunities within cities, regions, and territories, and seeks to address the resulting social, economic, and environmental disparities. While economic development models have long been building on the idea of local endowments and factors of production, the just transition and spatial justice literature bring in discussion the need for compensatory measures and redistributive policies. This literature advocates for policies and practices that aim to reduce spatial inequalities and create more just and equitable spatial arrangements. Building on the 60s-70s literature on social justice, spatial justice literature has been reflected in the past decades in a new stream of the urban studies literature (e.g. Marcuse, 2009; Soja, 2010; Stilianos and Ladias, 2011; Brenner et al., 2012, Slater, 2006). On just transition some of the main debates in the literature cover the extent to which current measures are achieving redistributive justice at local level (Sovacool, 2017; Jänicke, 2018).

Also, the subnational disparities between urban and rural areas have increased over the past decades in the context of increased internal migration and the rise of the cities. Spatial dynamics and agglomeration have informed a large set of studies on the new forms of urbanization and the urban-rural divide (e.g. Champion and Hugo, 2016; Vernon Henderson, 2010; Partridge and Rickman, 2006; Berdegué et al., 2015). This thematic discussion has achieved a large convergence of interests and preoccupation between policy researchers and academics, mirroring and informing each other's methods and data. The process of urbanization has continued at a rapid pace globally, with a significant influx of population into urban areas. This trend has led to the expansion of cities and metropolitan regions, resulting in increased pressure on urban infrastructure, housing, and services. Meanwhile, rural areas may experience population decline and depopulation, leading to a widening gap between urban and rural areas. Beyond the traditional divide in terms of economic opportunities and quality of public services and infrastructure, the urban-rural divide has also grown to include over the past decades the dimension of a digital divide (e.g. Van Dijk, 2005; Morris et al., 2022). This is reflected both in terms of digital infrastructure (e.g. broadband connectivity, internet speed, devices) and in terms of individual knowledge and skills, and can further exacerbate disparities in education, employment, and access to information and services. Subsequently, urban-rural digital divides have been further exacerbated by the COVID-19 crisis and the changes it launched in the way we learn and work (e.g. Chetty et al., 2020; Lai and Widman, 2021).

In addition, there are hot current debates on peripheries, which do not address any longer the peripheral areas as simply 'natural', according to simple geographical features; on the

contrary, distinction is made between economic, technological, social, institutional and geographical peripheries and their interrelations are discussed so as to identify the determinants for effective place-based policies and the 'de-marginalization' mechanisms (e.g., Storti et al., 2023; Barbero and Rodriguez-Crespo, 2022; Pugh and Dubois, 2021; Oppido et al., 2023; Jardon et al., 2024; etc.). A study undertaken by ESPON (2017) brings into the spotlight the concept of "inner periphery", which is examined in terms of general performance, level of development, access to services of general interest, relational proximity, quality of life. Such areas exist in almost all European countries and "seem to share a perception of 'being forgotten' in the national political agenda" (EPRS, 2019, p. 6). Figure 8 depicts the main drivers of inner peripherality and reveal the features of the territorial patterns for the inner peripheries. Thus, inner peripheries can be found in many other areas than those considered peripheral from geographical viewpoint, whereas border regions display a higher incidence of peripherality. Moreover, in many cases border effects are not limited to the areas close to the border, on the contrary, they affect larger territories (Fantechi and Fratesi, 2023).

Figure 8: Main drivers of inner peripherality



Source: ESPON (2017)

The solutions for deconstructing the marginality of peripheral areas, within so-called "de-marginalization processes", envisage the transformation of the local institutional framework, collective actions and 'self-governance' processes at local level, renovation of elite groups and economic renewal and innovation (Sorti et al., 2023). A special attention is paid to the institutional capacity, relational proximity and the role of local collaborative networks in peripheral regions (Torre, 2022) and, further on, to the transnational collaborative networks, when border regions are involved. According to ESPON (2017), a core aspect in the context

of inner peripherality is “the capacity of a territory to "connect" with its environment (regardless of its geographic location). Connectedness generate synergies, networks and other types of links that allow to be present in the places where relevant decisions are made, both in relation to public policy as well as in investment and private strategies” (p. 1). From this perspective, a well-connected territory is characterised by “more and better possibilities for development, better conditions of access to SGI, or a more dynamic labour market capable of retaining skilled population” (p.1).

Another important related debate in the spatial inequalities literature refers to the extent to which institutional capacity is mediating or amplifying subnational disparities, from the large dataset on the European Quality of Government Index that shows institutional capacity metrics at NUTS II level in the European Union, to a variety of studies looking at the role of institutions for regional development (e.g., Rodríguez-Pose, 2013). This essential link between regional disparities and governance or policy interventions is also reflected upon by Stoker (2005), Bahl and Wallace (2018) or Sepetis et al. (2024). Going deeper, the current place-based approaches are accompanied by new institutional models of regional economic regulations and governance, which expose the orientation of many nation-states to decentralising and devolving their institutional and political structures to regions and localities, with the aim of flexibilization of their space economies. This is a recognition of the locally variable nature of economic development and is also seen as a solution for curbing state expenditures (Pike et al., 2015; Danson and Wittam, 1999).

In addition to these thematic debates, another increasingly more important question is linked to the availability of relevant data. One of the first issues is that of defining the scale that data availability is required and its aggregation (Keuschnigg et al., 2019). Duranton and Overman (2005) and Elbers et al (2003) point to the relevance of micro-level data in pinpointing dynamics behind spatial inequalities accurately. Furthermore, Singleton and Arribas-Bel (2021) bring into question the definition of spatial units and their boundaries, and as such encourage a more granular assessment. However, the size of such databases also requires more sophisticated statistical methods such as Python programming (Rey and Anselin, 2010). Data availability and quality is also brought into question by several studies (e.g. Wagner and Henzen, 2022; Galimberti et al., 2021). The more complexity the world offers, the more innovative research methodologies have to become, and as such, there is also a plethora of new indicators, metrics and composite indexes covering spatial inequalities (e.g. Atkinson, Marlier and Nolan, 2004; Tarozzi and Deaton, 2009; Alkire and Foster, 2011; Lall and Deichmann, 2010). Finally, in terms of methods, the last decades brought about papers that cover issues related to the spatial autocorrelation and spatial dependence of local indicators (e.g. Anselin, 2010), as well as the temporal dynamics and varying relationships in spatial analysis (e.g. Fotheringham et al., 1998; Chen et al., 2022).

4. Looking ahead: policy implications

Even if the spatial inequalities are accepted as a reality of the contemporary economy and society, their scope, amplitude and persistence vary between countries and within countries, at subnational level, between various territorial units. They need to be observed and treated carefully, considering the fierce competition between countries, regions and even smaller geographical spaces. In other words, in an increasing regional competition there will be always winners and losers but “it is important to recognize the difference between absolute and relative winners (or losers)” (Nijkamp, 1997, p.17).

This entails a ‘rethinking’ of lagging regions, with the aim of better promoting their untapped potential. The EU structural assistance can unlock this potential by exploiting agglomeration for productivity growth, investment and job creation, provided the coordination failures are overcome through complementing approaches of sectoral interventions able to remove the distortions induced by government and market failures and to strengthen core endowments (skills, institutions) within regions (World Bank, 2018). In order to capitalize on the resulting place-based policies, areas where evidence base can be successfully extended have been suggested, such as: the investigation of long-run effects; the isolation of those policy features that make them effective or, on the contrary, create undesired distortions; the better identification of the effects and their beneficiaries; the interpretation of the interactions between areas where such policies are applied, etc.

(Newmark and Simpson, 2018). In addition, the Brookings Institute highlights in a recent report key findings and lessons of place-based policies: the importance of multi-level governance; tailored strategies to the specific needs, opportunities, and challenges of each locality; investment in infrastructure and innovation; focus on human capital; data-driven decision making; promoting inclusive growth; ensuring flexibility and adaptability; integrating lessons learned from successful case studies (Brookings Institute, 2021).

Moreover, building on the up-to-date findings and useful lessons, the current orientations regarding the future of the Cohesion Policy and the European growth model point to the need of a deeper integration of place-based and people-based approaches, in accordance with the spatial justice desideratum (IMAJINE, 2022), as well as to the ambition "to bring EU closer to citizens and to leave no one behind" (European Commission, 2023, p.5), in the complex context generated by the ongoing transitions – energy, digital, industrial ones – and COVID-19 recovery.

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ARTIFICIAL INTELLIGENCE WAVES IN FINANCIAL SERVICES INDUSTRY: AN EVOLUTION FACTORIAL ANALYSIS

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Abstract

Artificial intelligence (AI) has gained prominence in the financial industry. Thus, it is particularly interesting to address the financial services where AI-based systems are mainly used, the reasoning for their use, risks, and evolution potentialities. This research explores the viewpoints of professionals inside and outside the European Union area on AI-based services in the financial industry, aiming to analyze their current position and conceptualize their evolution through an integrative method study. The analyzed data pertain to 523 professionals (out of 740 contacted) who have compiled an online questionnaire related to four study pillars, such as AI-based systems use in financial services (A), the reasoning for their use (B), their risks (C) and evolution potentialities (D). Then, we examine how AI-based systems impact the evolution of AI in financial services (D) use in financial services (A), the reasoning for their use (B), and their risks (C). The study argues that to encourage a sustainable future of AI evolution in the financial sector, the risk management approach is a crucial aspect that regulatory bodies should consider accurately. According to the field professionals' collected opinions in this study referring to their gender and age, special attention should be paid to these risks: AI limitations in forecasting market uncertainties, their lack of ethical values and explainability, as well as their no-audited versions. Therefore, academia and field professionals recommend the establishment of regulatory standards that, compared to risk management approaches, leave enough space even for AI innovation.

Keywords: artificial intelligence, financial services industry, fintech, risk management
JEL classification: G21, G22, G23

1. Introduction

Human intelligence expresses the mental ability to reason, problem-solve and learn. It comprises cognitive functions such as memory, language, planning, attention, and perception (Colom et al. 2022).

Over the years, human intelligence has exploited technology to support and complement human cognitive functions, also known as Intelligence Augmentation (IA) (Kyllonen, Roberts, and Stankov 2010). In this way, IA is typically focused on building systems that put humans and machines to work together. Further advancements in this matter have brought about artificial intelligence (AI applications/models/systems/platforms), also known as machine intelligence. This technology is focused on the complete outsourcing of intellectual tasks (making predictions, recommendations, or decisions) to machines (Turing 1950). The AI uses massive amounts of alternative data sources and data analytics called 'Big Data.' The last ones feed Machine Learning (ML) models, which can learn from data sets and surpass human intelligence in executing determinate tasks without being explicitly programmed by humans (Tzimas 2021).

Recent statistics show that revenues from AI-based products worldwide are expected to reach 126 billion dollars by 2025 (statista.com). Furthermore, the percentage of organizations employing AI-based systems grew 270% over the past four years (gartner.com). Meanwhile, in 2025, 95% of customer interactions are expected to be powered by AI (servion.com).

Thus, it can be confirmed that AI has gained a prominent position (Panetta et al. 2018) and has attracted the attention of various financial services (Lin, 2019), such as asset management

(Gupta 2020), algorithmic trading (Cohen 2022), credit underwriting (Brotcke 2022) or blockchain-based financial services (Smith 2019).

AI-based tools in finance are not limited to a few applications but are diversely used and consistently gaining popularity. These tools range from those enhancing financial education, automating administrative tasks for educators, creating innovative content for lessons, providing voice assistance, to implementing hyper-personalization techniques for student follow-up processes (Alenezi and Faisal 2020). Social media platforms also leverage unique AI algorithms to deliver relevant financial content. For instance, Facebook's DeepText tool adeptly understands conversations and translates posts into different languages, while Twitter uses AI to combat inappropriate remarks.

Instagram, a popular social media platform, leverages big data and AI to enhance user experience and optimize financial target advertising. Another noteworthy AI application, 'RegTech', is employed for meeting regulatory and compliance requirements and for reporting purposes (De Lis 2016). Authorities also utilize an application called 'SupTech' for regulatory, supervisory, and oversight tasks (Di Castri et al. 2019).

In addition, AI chatbots comprehend natural language and respond to people online who use the "live chat" feature that many insurance companies provide for customer service (Onyuma 2019). The chatbots powered by Natural Language Processing (NLP) are also used in other financial services such as personal finance (for financial health management purposes), consumer finance (fraud and cyber-attacks prevention), and corporate finance (predict and assess loan risks, perform advanced fraud detection and spot anomalous activities) referring to Insider Intelligence 2022 data.

Nonetheless, the researchers affirm that AI-based tools have issues of uncertainty risk (Wu et. al., 2014), cybersecurity, and systemic risks (Lee 2021). They also suffer from a lack of explainability (Giudici and Raffinetti 2022; Holzinger 2018), ethics, equity, bias, and reliability risk (Biolcheva 2020). In other words, various risks may arise while implementing these AI-based tools to facilitate our financial activities while reducing information, communication, analysis costs, and related risks.

Therefore, this paper tries to contribute to the existing literature in three different ways: This study addresses the financial services where AI-based systems are mainly used, the reasoning behind their use, their risks, and their evolution potentialities. This research helps fill the literature gap on this topic.

Employing a comprehensive mixed method, this research thoroughly explores the perspectives of professionals within and outside the European Union on AI-based services in financial services. The aim is to provide a robust analysis of their current status and potential evolution.

This paper captures and presents valuable findings and insights to policymakers, regulators, and professionals in the FinTech industry, with the goal of supporting and promoting the use and evolution of responsible AI.

2. Literature review

Today, the AI approaches have revolutionized how modern economies and societies serve thoughts, behaviors, research, and do business (Abrardi, Cambini, and Rondi 2019; Bolton et al. 2018; Boyd and Holton 2018). In finance, they provide relevant legal, accounting, tax, and auditing knowledge (Faina, Alturas and Almeida 2020; Smith 2019). They also detect possible fraud (Potamitis 2013) or suspicious activity. Another AI is represented by NLP, also known as Automatic Speech Recognition (ASR). They analyze human languages (sentences) using algorithms to translate the human sentences and, thus, automatically proceed to a given task (Yu and Deng 2016). The NLPs and chatboxes in the insurance sector communicate and convey products to customers (Onyuma 2019).

Further development of AI is evidenced in the banking sector, which benefits from using advanced mathematical and statistical models like predictive analysis, artificial intelligence, and data mining (Shakya and Smys 2021). For example, machine learning (ML) models offer a higher customer default forecasting accuracy for credit scoring purposes than standard statistical models (Albanesi and Vamossy 2019).

AI solutions and ML are increasingly being used in the financial services sector, particularly in improving operational efficiency. This trend has garnered significant interest in recent years, with a focus on enhancing performance, managing risks, and improving customer experience (Ogege and Boloupremo 2020; Lundberg and Lee 2017). In portfolio allocation and stock selection activities, AI is making significant strides. In trading activities, AI algorithm techniques such as evolutionary computation, deep learning, and probabilistic logic are used for predictions, decision-making, and trade execution (Metz 2016).

In the insurance sector, AI adoption has improved the performance of back-office operations and customer approach (Lee, Floridi, and Denev 2021). These businesses implement AI-based solutions while demanding a competitive market advantage (Žigienė, Rybakovas, and Alzbutas 2019; Gandomi and Haider 2015).

AI is also implemented in financial education and incorporated into administration, teaching, and learning issues (Chassignol et al. 2018). In social media, AI technologies are highly effective monitoring processes (Sterne 2017). Thus, AI helps understand how people interact in social networks and discuss a given topic, as well as concerns that are further explored for financial business purposes. Text mining and analyzing social media posts and tweets through NLP algorithms can inform trading decisions in this context. It occurs as NLP uses these data to identify certain market behaviors.

Foremost in the research field, AI-based solutions that provide complex calculations have increasingly gained popularity during the last few years (Li et al., 2021; Li and Xu 2021; Lin 2021; Moskowitz et al. 2006).

However, there is a controversial debate over the financial risks in AI-driven solutions (i.e, exacerbate illegal practices in trading aiming to manipulate the markets) and the limitations of AI (Azzutti 2022; Azzutti, Ringe and Stiehl 2021; Jarco and Sulkowski 2023). Despite these debates, the European GDPR EU (2016) regulation requires that AI systems carry meaningful information about the logic involved in the automated decision-making process and act according to legal dispositions in force. This regulation, in fact, paves the way for AI to make problem-solving in finance easier and faster, offering a more optimistic perspective (Chen et al. 2019).

Comprehensively, the idea that the presence of various risks evidences financial AI is supported (Mohamed et al. 2013). For example, uncertainty risk makes developing optimization models more difficult (Wu, Chen and Olson 2014). Many other issues related to AI are related to ethics, equity, bias, and decision-making reliability (Biolcheva 2020; Boyd and Crawford 2012). Meanwhile, with the popularity of advances in financial AI services, cybersecurity and systemic risks have increased (Lee 2021; Abawajy, Kelarev and Chowdhury 2014). Another major issue in this field emerges concerning AI operations, where these systems need more explainability, and this becomes difficult in the auditing process (Giudici and Raffinetti 2022; Fritz-Morgenthal, Hein and Papenbrock 2022; Holzinger 2018). Correspondingly, in the coming years, the primary commitment will be to conduct a more profound analysis of AI developments concerning their risk management approaches. Thus, as a comprehensive regulatory framework, the EU AI Act (2023) embodies the EU's commitment to address the ethical, legal, and societal challenges precipitated by AI technologies (Musch, Borrelli and Kerrigan 2023).

The study of Balavenu et al. (2022) proposes that AI approaches can also be used in regulating the financial sector. In this context, the crucial role of national competent authorities is underscored. They are tasked with supervising and enforcing the EU AI Act's (2023) provisions within their respective jurisdictions, thereby playing a pivotal role in the successful implementation of the Act (Musch et al., 2023).

Other researchers, Azzutti et al. (2023), inspired by the EU AI Act (2023), have investigated the advantages of a 'rule-based' and 'risk-oriented' regulatory approach. They claim a combination of ex-ante and ex-post regulatory measures must be put into perspective with the 'AI life cycle'.

Critics argue that stringent regulatory requirements for high-risk AI systems might shrink innovation by imposing onerous compliance burdens on developers. In other words, this means less AI research and development for small and medium-sized enterprises (SMEs) by favoring established entities with more significant resources ((Musch, Borrelli and Kerrigan 2023). Additional research in compliance with the EU AI Act (2023) argues for establishing

AI Law Audit model departments within financial companies using AI functions (Doekes 2023).

However, further studies argue that a human being should always decide which model should be used, which one needs to be reviewed, and which models should be discontinued (Fritz-Morgenthal, Hein and Papenbrock 2022).

It is worth noting that the existing literature lacks comprehensive studies that analyze attitudes toward the use of AI in financial services while also highlighting their risks and potential for evolution. This study's novelty lies in its unique approach to determining professional viewpoints through a mixed-method study.

3. Methodology

3.1. The methodological research design

This research study uses an online questionnaire to collect professionals' opinions concerning various aspects of AI use in the financial services industry.

The questionnaire, a comprehensive tool, is structured into two sections. The first section focuses on the demographic background of the respondents, encompassing gender, age, country, employment position, and educational/academic qualifications. The second section, the core of the questionnaire, explores the four pillars of AI use in the financial services industry, each containing four elements. These pillars are ***A. The use of technology as a financial service through AI-based functions; B. Reasons for using or not using AI; C. The main risks that AI faces; and D. The evolution of AI in financial services.***

We apply an integrative method study. Concretely, we use the quantitative method (questionnaire) numerical data and qualitative methods (focus groups: field professionals, their gender and age) descriptive data to test a hypothesis-based approach. Thus, we test whether the use of technology as a financial service through AI-based functions (A), considering the reasons for using or not AI (B), as well as the main risks that AI faces (C), impact the evolvement of AI in financial services (D). The research study hypothesis is specified below:

$$Ho: D= \beta 0+\beta 1*A +\beta 2*B + \beta 3*C + \mu t. \quad (1)$$

3.2. Participants and data

In this research study, 523 professionals out of 740 were contacted, and 15.3% were young (18-25 years old). The participants' nationalities (see Table 1) in percentage are Albanian (31.35%), Czech (6.88%), German (10.7%), Hungarian (8.6%), Italian (6.11%), Kosovo (6.69%), North Macedonian (8.41%), Portuguese (8.6%), Romanian (6.5%) and British (6.11%). The majority of study participants are female (65.8%). Meanwhile, more than 8.22% of the participants involved in the study are researchers and members of Cost-Action (CA) field programs. In general, the participants of the study are university academic staff (16.6%), certified accountants (8.4%), economists (20.2%), employees in the financial sector (10.9%), IT specialists (13.9%) and university students (30%) inside and outside the European Union area. All of them have used AI functions in the financial services industry.

The university students in the study are primarily from bachelor's (65.4%), professional (5%), Economists in the study hold bachelor's degrees (20.7%), professional master's (47.1%), scientific master's degrees (26.5%), and the rest (11.1%) are Ph.D. candidates, demonstrating a high level of academic achievement.

The certified accountant study participants hold even a Ph.D. degree. The employees in the financial services industry hold a bachelor's degree (31.6%) and a professional master's degree (24.6%), and the rest hold a scientific master's degree (43.8%). The IT specialists hold professional master's degrees (73.3%), and the rest hold full professor titles (26.7%).

The academic staff have a scientific master's degree (26%) or are Ph.D. candidates (6.2%), in addition to those who possess Ph.D. degrees (34.6%), the associate professor title (22.2%), and the full professor academic title (11%).

Table 1. Study participant`s data

		Environment		Age					
The demographic information	**Total**	**CA**	**No CA**	**18-25**	**26-34**	**35-44**	**45-54**	**55-64**	**+65**
Base size	523	43	480	80	101	69	122	100	51
Albanian participants	164	14	150	38	29	17	56	16	8
Czech participants	36	6	30	0	10	6	7	6	7
German participants	56	6	50	12	5	8	13	12	6
Hungarian participants	45	5	40	2	4	1	15	21	2
Italian participants	32	0	32	6	1	6	8	6	5
Kosovo participants	35	0	35	10	4	5	3	13	0
North Macedonia participants	44	4	40	6	9	4	8	12	5
Portuguese participants	45	0	45	0	12	16	5	2	10
Romanian participants	34	0	34	1	21	3	4	5	0
British participants	32	8	24	5	6	3	3	7	8

Source: Questionnaire data

3.3. Research method

The online questionnaire (see Table 2) to explore professionals' opinions concerning AI functions used in the financial services industry was delivered through their official e-mail addresses. The questionnaire evaluation uses the Likert scale from 1 (one) to 5 (five), meaning: 1= Strongly disagree (Sa); 2=Disagree (D); 3 = Undecided (U); 4=Agree (A) and 5= Strongly agree (Sa). The SPSS 20 (SPSS Inc., Chicago, IL) statistical program is used to analyze the data and further test the below research hypothesis:

$$Ho: D= \beta 0+\beta 1*A +\beta 2*B + \beta 3*C + \mu t. \quad (1)$$

The results of the Shapiro-Wilk test (1968) indicate that the key elements of the Likert scale data from the questionnaire do not follow a normal distribution. Thus, in order to test whether the use of technology as a financial service through AI-based functions (A), considering the reasons for using or not AI (B), as well as the main risks that AI faces (C), impact the evolvement of AI in financial services (D) we use both ordinal regression analysis and ordinal logistic regression that does not assume normality.

First, we apply ordinal regression analysis. This approach is used to understandthe relationship between the independent variables (A, B, and C) and an ordinal dependent variable (D). It allows for modeling the probabilities of the different categories of the ordinal outcome (D), providing insights into how the predictor variables (A, B, and C) influence the likelihood of being in a higher or lower category.

Then, we apply ordinal logistic regression analysis, a specific type of ordinal regression that assumes a proportional odds model. This method is particularly useful when the assumption of proportionality holds, meaning that the relationship between each pair of outcomes is the same. This method estimates the odds of being in a higher category versus all lower categories combined, which can be particularly informative for our hypothesis testing.

By applying both analyses, we can cater to different assumptions and thoroughly examine the research hypothesis. This dual approach allows for a comprehensive understanding of the data, accommodating various modeling needs and enhancing the reliability of our findings.

Table 2. Likert scale questionnaire

				Rating 1-5				
				Sd	D	U	A	Sa
				1	2	3	4	5
The use of technology as a financial service through AI functions		A1	AI is mostly used in financial and banking services					
		A2	AI is mostly used in insurance, accounting and auditing services					
		A3	AI is mostly used in financial education and scientific research services					
		A4	AI is mostly used in social media (Facebook, Twitter and YouTube) for financial advertisement purposes					
Reasons for using or not AI (B)		B1	AI provides cheaper, faster, larger, more accessible, more profitable, and more efficient services in many ways					
		B2	AI solves Strategic Decision Problems and Effectively forecasts					
		B3	AI cannot help in prediction of outcomes, problem solving in investment management (IMT), fraud detection (FDT), algorithm trading (AT), and correct underwrite loan and insurance products (LIU)					
		B4	AI does not always operate in alignment with laws and regulations and the privacy of customers isn`t guaranteed					
The main risks that AI face (C)		C1	AI is limited in capturing all that is happening in the marketplace (market uncertainties) and cannot judge what has not happened yet					
		C2	AI operates based on historical discriminatory practices, lack ethical values and explainability					
		C3	AI is vulnerable to cybersecurity risks					
		C4	AI cannot be always audited					
The evolvement of AI in financial services (D)		D1	The development of responsible AI enhances financial services and improves regulatory compliance					
		D2	The growth of digital economy will facilitate the expansion of AI-based functions in financial services					
		D3	Policymakers and financial regulators should deeply analyze the risk management issues of AI to provide more transparent and auditable versions					
		D4	The overregulation in AI use in financial services might impede the innovation in the field					

Source: Questionnaire results

The data collected per each pillar element (A/B/C and D from 1-4) are evaluated using average ratings. Decimal values are rounded to the nearest value. This first transformation is advisable because most information users need help figuring out how to use Likert Scales, such as the 5-point scale.

4. Results and discussions

Only 70.7% of professionals contacted by e-mail completed the questionnaire. According to these data, 37.5% of the elements evaluated in this questionnaire were rated 4 (participants agree with AI use in the financial services industry), and the rest of 62.5% were rated 3 (participants are undecided about AI use in the financial services industry; see Table 3).

Table 3. Likert scale general questionnaire results

		1	2	3	4	5
A1	AI is mostly used in financial and banking services			X		
A2	AI is mostly used in insurance, accounting and auditing services			X		
A3	AI is mostly used in financial education and scientific research services			X		
A4	AI is mostly used in social media (Facebook, Twitter and YouTube) for financial advertisement purposes				X	
B1	AI provides cheaper, faster, larger, more accessible, more profitable, and more efficient services in many ways				X	
B2	AI solves Strategic Decision Problems and Effectively forecasts			X		
B3	AI cannot help in prediction of outcomes, problem solving in investment management (IMT), fraud detection (FDT), algorithm trading (AT), and correct underwrite loan and insurance products (LIU)			X		
B4	AI does not always operate in alignment with laws and regulations and the privacy of customers isn`t guaranteed			X		

		1	2	3	4	5
C1	AI is limited in capturing all that is happening in the marketplace (market uncertainties) and cannot judge what has not happened yet			X		
C2	AI operates based on historical discriminatory practices, lack ethical values and explainability			X		
C3	AI is vulnerable to cybersecurity risks				X	
C4	AI cannot be always audited			X		
D1	The development of responsible AI enhances financial services and improves regulatory compliance				X	
D2	The growth of digital economy will facilitate the expansion of AI-based functions in financial services				X	
D3	Policymakers and financial regulators should deeply analyze the risk management issues of AI to provide more transparent and auditable versions				X	
D4	The overregulation in AI use in financial services might impede the innovation in the field			X		

Source: Questionnaire results

Table 3 data shows that the elements mostly rated with 4 pertain to pillar D: evolvement of AI in financial services 3 out of 4. Meanwhile, the other study pillars, such as A: The use of technology as a financial service through AI-based functions; B: Reasons for using or not AI; and C: The main risks that AI faces, are generally rated at 3 (3 out of 4 elements in these pillars are rated 3).

Referring to the evolvement of AI in financial services pillar D, the elements where the participants agree toward the use of AI in financial services are:

D1-The development of responsible AI enhances financial services and improves regulatory compliance;

D2 - The growth of the digital economy will facilitate the expansion of AI-based functions in financial services;

D3-Policymakers and financial regulators should deeply analyze AI risk management issues to provide more transparent and auditable versions.

The D1 is rated highly by Romanian participants (with 5), followed by Portuguese participants (with 5), Hungarian participants (with 4), British participants (with 3.7), Italian participants (with 3.6), and Albanian participants (with 3.5). D2 instead is rated mainly by Romanian participants (with 5), Italian participants (with 4.5), Hungarian and Portuguese participants (with 4), and Albanian participants with (3.6). At the same time, D3 results were highly rated by Romanian and Portuguese participants (with 5), followed by British participants (with 4.25), Hungarian, Italian, Kosovo, and North Macedonia participants (with 4), and Albanian participants (with 3.5).

Generally, pillar D is rated on average by university academic staff with 4.02, certified accountants with 3.7, economists with 3.6, employees in the financial sector with 3.5, IT specialists with 3.02, university students with 3.3, and the researchers engaged in Cost Action programs with 3.3. This distribution of values demonstrates that professionals inside and outside the European Union share different opinions concerning AI functions used in the financial services industry.

Accordingly, it is essential to understand how to improve AI evolution in financial services (D). Thus, we test whether the use of technology as a financial service through AI-based functions (A) also considering the reasons for using or not AI (B) as well as the main risks that AI faces (C) impact the evolvement of AI in financial services at 95% confidence level, as in following:

$$Ho: D = \beta 0 + \beta 1 * A + \beta 2 * B + \beta 3 * C + \mu t. \quad (1)$$

The analysis demonstrates that the Likert scale data for the A, B, C, and D pillar elements are not normally distributed, as the Shapiro-Wilk test significance is lower than 0.05, referring to the above ordinal regression variables at a 95% confidence level (see Table 4).

Table 4. Ordinal regression variables tests of normality data

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
A	0.098	523	0.000	0.958	523	0.000
B	0.131	523	0.000	0.948	523	0.000
C	0.130	523	0.000	0.954	523	0.000
D	0.109	523	0.000	0.935	523	0.000

Source: Author`s calculations

In addition, through the test of parallel lines, the ordinal regression model significance is estimated 0.000 (lower than 0.05). It confirms that location parameters (slope coefficients) are the same across response categories in D variable (see Table 5).

Table 5. Test of parallel lines

Model	2 Log Likelihood		Chi-Square	df	Sig.
Null Hypothesis					
General	2061.589	920.429	1141.160	42	0.000

Source: Author`s calculations

Thus, we proceed with the Generalized Linear Model (ordinal logistic regression analysis) to estimate whether the use of technology as a financial service through AI-based functions considering also the reasons for using or not AI as well as the main risks that AI faces impact on the evolvement of AI in financial services at 95% confidence level. The omnibus test demonstrates that the Generalized Linear Model used to test our hypothesis described above (see Table 6) fits well. The Chi-square significance is 0.000 (lower than 0.05). Also, the test of model effects confirms the omnibus test results as the significance of A (37.429), B (20.282), and C (92.719) is 0.000 (lower than 0.05).

Table 6. Omnibus Test

Likelihood Ratio Chi-Square	df	Sig.
515.487	3	0.000

Dependent Variable: Evolvement of AI in financial services (D)
Source: Author`s calculations

The Generalized Linear Model (ordinal logistic regression analysis) parameters presented in Table 7 confirm that each study pillar A, B, and C impacts the evolvement of AI in financial services (pillar D) and is statistically significant at a 95% confidence level.

Table 7. Generalized Linear Model Parameters Estimation

			95% Wald Confidence Interval		Hypothesis Test			
Parameter	B	Std. Error	Lower	Upper	Wald Chi-Square	df	Sig.	Exp(B)
A	0.620	0.1027	0.418	0.821	36.406	1	0.00	1.858
B	0.613	0.1375	0.343	0.882	19.856	1	0.00	1.845
C	1.379	0.1475	1.090	1.668	87.380	1	0.00	3.969
(Scale)	1							

Dependent Variable: Evolvement of AI in financial services (D)
Source: Author`s calculations

In addition, Spearman`s correlations (see Table 8) confirm that pillars A (0.641), B (0.616), and C (0.701) have a moderate and statistically significant correlation with D.

Table 8. Spearman`s Correlations

		A	B	C	D
Spearman's rho	A Correlation Coefficient	1	0.585	0.627	0.641
	Sig. (2-tailed)		0	0	0
	N	523	523	523	523
	B Correlation Coefficient	0.585	1	0.721	0.616
	Sig. (2-tailed)	0		0	0
	N	523	523	523	523
	C Correlation Coefficient	0.627	0.721	1	0.701
	Sig. (2-tailed)	0	0		0
	N	523	523	523	523
	D Correlation Coefficient	0.641	0.616	0.701	1
	Sig. (2-tailed)	0	0	0	
	N	523	523	523	523

Source: Author`s calculations

5. Conclusions

This study analyzed the viewpoints of professionals inside and outside the European Union area on AI-based services in the financial industry, aiming to understand their current position and conceptualize their evolution. Some of the study professionals are also researchers and members of Cost-Action programs in the field. The last ones have rated the study elements concerning the evolvement of AI in financial services (pillar D), such as D1 with 3, D2 with 3.4, D3 with 3.45, and D4 with 3.4. At the same time, the other study professionals (non-Cost Action program members) have rated D1 with 3.5, D2 with 3.6, D3 with 3.5, and D4 with 3.2.

In this light, it should be stated the fact that researchers were less confident in comparison with other study professionals referring to the following elements:

D1-The development of responsible AI enhances financial services and improves regulatory compliance;

D2-The growth of the digital economy will facilitate the expansion of AI-based functions in financial services;

D3-Policymakers and financial regulators should deeply analyze AI risk management issues to provide more transparent and auditable versions.

The vice versa occurs for D4-The overregulation of AI use in financial services might impede innovation in the field; the researchers are more confident in this point (rated it with 3.4) than the rest of the study participants (with 3.2).

From a gender context, instead, the results confirm that males have rated, on average, pillar D with 4 and females have rated it with 3. Thus, it means that males trust the current evolution of AI in the financial services industry, while women are more demanding.

While referring to age, all the professionals who participated in the study rated pillar D on average at 3, meaning they are undecided.

In general terms our analysis demonstrates that the current use of technology as a financial service through AI-based functions (A) considering also the reasons for using or not AI (B) as well as the main risks that AI face (C) help in the evolvement of AI in financial services (D). Statistically based, the ordinal regression analysis route-one results confirm that for every unit of improvement in:

- The use of technology as a financial service through AI-based functions (A), there is a predicted increase of 0.620 in the log odds of being at a higher level of the evolvement of AI in financial services (D);
- The reasons for using or not AI (B), there is a predicted increase of 0.613 in the log odds of being at a higher level of the evolvement of AI in financial services (D);
- The main risks that AI faces (C), there is a predicted increase of 1.379 in the log odds of being at a higher level of the evolvement of AI in financial services (D).

The ordinal logistic regression analysis route-two results show that the odds ratio of being in a higher level of evolvement of AI in financial services (D) increases by a factor of:

-1.858 for every one unit increase in the use of technology as a financial service through AI-based functions (A);

-1.845 for every one unit increase on the reasons for using or not AI (B);

-3.969 for every unit increase on the main risks that AI faces (C).

Thus, according to professionals' points of view independent of their profile, it can be deduced that much more should be done to manage the main risks that AI faces (pillar C), such as:

C1. AI is limited in capturing everything happening in the marketplace (market uncertainties) and cannot judge what has yet to happen (rated on average at 3.27). Therefore, it is crucial to support the research on correctly using AI to forecast market uncertainties. This support can enhance investors' trust in financial markets, business growth by collecting additional funds, and new product delivery by positively impacting the financial industry. Finally, the overall economy can benefit.

C2. AI operates based on historical discriminatory practices, lacks ethical values, and is not explainable (rated on average at 3.41). The development of fair and ethical AI emerges as an industry-wide objective. Correspondingly, regulatory standards can overcome these issues only by establishing bridges of dialogue with the industry.

C3. AI cannot always be audited (rated on average at 3.17). This is another point considered emergent by the professionals. Regulators should ensure the establishment of independent audit bodies for AI systems. In this way, more reliable and improved AI versions can be achieved.

Furthermore, the results confirm that the continuous use of technology as a financial service, facilitated by AI-based functions for various reasons, contributes to the evolution of AI in the financial services sector.

The study results also highlight that a robust risk management approach is essential for regulatory bodies to consider in order to foster extensive use and ensure a sustainable future for AI in the financial sector. At the same time, in the context of developing the first AI legislative act, academics and industry professionals advocate for establishing standards that balance risk management with the need to support AI innovation. It is worth noting that this study focuses only on professionals' viewpoints on the potential evolution of AI-based systems within the financial services industry. Future research endeavours could explore diverse viewpoints and assess the impacts of the EU AI Act on specific segments of the financial industry.

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THE IMPACT OF THE FOOD PRODUCTION PROCESS IN THE PEJA REGION OF KOSOVO: THE CASE OF PI&KI BISCUITS OF EGI GROUP

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Abstract
The aim of the paper was to determine the influence of temperature and different amounts of sodium hydrogen carbonate on the texture and color of tea cakes obtained under laboratory conditions. Each mix varied according to the amount of sodium bicarbonate added, the granulation of the sugar, or the baking temperature. Product texture was analyzed daily using a texture analyzer and color was measured using a Minolta Chroma meter. After baking the tested samples, measurements were made of the length and height of the tea cakes, as well as the dynamics of changes in water activity and moisture content during baking. The results of texture analysis showed that an increased percentage of sodium bicarbonate decreases the strength of tea cakes, while at higher temperatures, strength and brittleness increase. In terms of color, the results showed that comparing the total color change of tea paste obtained from different blends and roasted at different temperatures, the least color change in most cases was the blend with the lowest percentage of sodium hydrogen carbonate.

Keywords: tea paste, texture, color, temperature, sodium bicarbonate
JEL classification: CODE,

1. Introduction

Tea biscuits are a food product made mainly from flour, sugar and fat. They can be of different shapes, sizes, with different fillings or accessories. Even today, tea pastries are considered typical representatives of flour flavors that are produced both in factories and at home. Lines for the production of tea biscuits are automated, although there are currently very few manufacturers who have fully automated the entire production process. One of the important characteristics is the responsibility of the production technologist, of course his ability to make high quality tea cakes and awareness of the potential of purchasing quality ingredients. In this topic, the influence of roasting temperature and different percentage of sodium bicarbonate on the change of texture and color of tea paste was monitored. The tea paste produced was obtained in laboratory conditions that differed in the baking temperature, the added amount of sodium bicarbonate, the type of fat and sugar. In parallel with the monitoring of the temperature and the tools for raising the dough, the moisture content and water activity were also monitored.

2. LITERATURE REVIEW

Raw materials for the production of tea biscuits.

Flour

Technological quality of flour, nutritional value, chemical composition and health status are determined by a number of chemical, physical, microbiological, rheological and other analytical methods. The aim is to determine in advance the ability of the flour to produce high quality commercial products. (Kent and Evers, 1994). In the production of tea pastries, the most commonly used flours are wheat flour T-400 and T-550. A very important feature of tea pastries is flour granulation, and the choice of flour according to its granulometric composition depends on the raw material of the dough and the method of mechanical processing. Such wheat flours have low protein content and flour texture and have a larger

grain than durum cookie flour, and the reason for this is that using larger particles and low protein flour reduces the absorption power.

Chemical composition of wheat and flour

In the grain of wheat, the main groups of chemical compounds are carbohydrates, proteins, lipids, fibers and mineral substances. The endosperm, coat and embryo make up the structure of the wheat grain. With the technological process of milling, the gut gives bran, and the endosperm gives flour. (Arendt and Zannini, 2013).

Table 1. Average chemical composition of wheat grain (Koehler and Wieser, 2013)

Chemical composition	%
Proteins (Nx6.25)	11.3
Lipid	1.8
Carbohydrates	59.4
Dietary fiber	13.2
Minerals	1.7
Water	12.6

Water, proteins, starch, fats, pentosans and sugars are the most important components for flour quality during technological processing. The average chemical composition of flour for a given degree of grinding was obtained by grinding different wheat mixtures.

Table 2. Average chemical composition of flour (%) at different grinding levels

	% of the mixture			
Chemical composition	50	70	80	94-100
Minerals	0,46	0,62	0,80	1,7
Proteins	10,7	12,2	13,0	13,5
Lipoidit	1.1	1.5	1.8	2.3
Fiber	0,1	0,2	0,3	2,1
Starch and sugars	84	81	81	73

Most of the food that humans consume is in the form of starch, which is an excellent source of energy. Starch is found in plants in the form of grains and is known to be quantitatively the main component of the wheat grain. Starch granules of different origins differ in shape, size and general appearance. The difference between wheat starch grains and starch grains of other cereals can be observed by microscopic observation. By grouping the granules according to size, we obtain small, medium and large starch granules. The size of the starch granules actually has no effect on the quality of the flour. If wheat starch is heated with water, the starch grains swell and a colloidal suspension is formed, which is separated into two components, amylose and amylopectin. Grinding wheat grains leads to the gradual crushing of the endosperm and the destruction of the structure of large and small particles. The finer the grinding, the more damaged granules there are and the quality of the flour depends on the amount of damaged starch granules. Namely, damaged starch granules are a source of carbohydrates for the production of sugar, which is necessary during dough fermentation, while undamaged starch grains do not gelatinize at the temperature of dough fermentation. (Hoseney, 1994, Arendt and Zannini, 2013)

Sugars: In addition to starch, wheat flour also contains other carbohydrates such as monosaccharides, disaccharides, oligosaccharides and polysaccharides. The total percentage of sugar, but also the representation of individual sugars in wheat varies depending on the variety of wheat as well as the conditions of development. The percentage of sugar in the sprout is 16.2-16.9%, while the total percentage of sugar in the shell is about 5%.

Table 3. Average percentage of free sugars in wheat flour (MacArthur, L.A., D'Appolonia, B.I., 1979)

Sugar composition	%

Sucrose	0,47
Raffinose	0.31
Maltose	0.08
Fructose	0.03
Glucose	0.04

Hemicelluloses and pentosans: The terms hemicelluloses and pentosans are often used interchangeably, so they often seem to have no exact meaning. However, they together constitute the non-starch, non-cellulosic polysaccharide portion of the plant. Polysaccharides that have pentoses as their basic units are divided into pentosans that are soluble and those that are not soluble in water. Hemicellulosic substances are called pentose polysaccharides that are not soluble in water, while pentosans are pentose polysaccharides that are soluble in water. Soluble and insoluble pentosans have such a position of the hydroxyl group in water that they easily bind to water molecules. Their branched structure allows them to bind a large amount of water, which means that pentosans increase the water content of dough and produce products with a higher water content and slow down the aging tendency of bread products. (Hoseney, 1994)

Proteins: Proteins are complex chemical compounds with high molecular mass and are also the main component for determining the quality of flour in wheat grains. Proteins are represented in different ways in the wheat grain, so in the envelope of the wheat grain there is about 15%, while in the germ the proportion of proteins is between 17% and 27%. In the endosperm, depending on the type of wheat, there is 5-16% protein, although within the endosperm the percentage of protein increases from the center towards the aleurone layer. Wheat contains the following proteins:

- albumin
- globulin
- prolamin (gliadin)
- glutelin (glutenin).

It is thanks to prolamin and glutelin that wheat differs from other cereals. (Hoseney, 1994)

Lipids: The term lipid often includes fats and fat-like substances, of which 1.5-2.5% are in flour. Lipids are natural organic compounds that dissolve in fatty solvents, but also the most unstable compounds in the wheat grain. Although they are present in small amounts, lipids play an important role in the formation of the physical properties of the dough and to a large extent positively affect the technological quality of the flour. Flour from which lipids are extracted gives a dough that is less elastic and provides greater resistance to stretching. Although the percentage of lipids in flour is small, their functional properties are of great importance in the technological production based on flour. Flour lipids consist of: triglycerides, phospholipids and glycolipids. Phospholipids have a favorable effect on gluten, which holds more gas in the dough and the product itself acquires a larger volume and a better structure. Glycolipids and phospholipids bind to flour proteins and starch and affect their mobility and flexibility. (Gavrilović, 2003).

Pigments: Pigments are color carriers with different chemical compositions. In wheat and wheat products, they are found in very small amounts, and are usually yellow pigments: carotene, xanthophylls and flavones. (Pomeranz, 1988).

Mineral substances: Regarding mineral substances, it is important to mention that these are substances that support many vital functions in the body and play an important role in nutrition. The main mineral substances that the body needs are sodium, potassium, calcium, magnesium, iron, chlorine, sulfur and phosphorus, while the mineral substances present in flour are phosphorus, potassium, magnesium and calcium. How important minerals are in flour is shown by darker flours, which have more minerals and, at the same time, greater biological value. (England, 1998)

Water

According to the Ordinance on the health of drinking water, drinking water is all water that, in its original state or after treatment, is intended for drinking, cooking or food

preparation, as well as water used in the production, processing and conservation. of products or substances intended for human consumption (MAŠVG, 2005). The water used during the technological production of certain products must be colorless, tasteless and odorless. If there is an increase in the acidity of the water or there are ammonia residues, this means that the water is polluted due to the decomposition of organic matter and therefore such water should not be used in the food industry. , nor in the production of tea pastes. If the water hardness is too high, ion exchangers are used, while filtration is used to remove mechanical impurities. Water is present in the dough in free and bound form. The amount of free water in the dough regulates the highly elastic properties of the dough. During boiling, the gluten proteins swell, until an equilibrium is reached between the osmotic pressure and the pressure between the gluten micelles. Flour with a certain composition of the raw material is able to create a dough with a minimum water content as well as with a water content higher than the value for the water absorption power of the flour. (Gavrilović, 2000)

Fats

Even before sugar, which was only known in the Middle Ages and was first used as a spice and only later as food, fats were used as ingredients in various products. (Handbook on Improvers and Other Raw Materials for Baking and Confectionery, 2007). At that time, the functional properties of fat were not thought about, although it was known since then that fat is highly nutritious and that it is a concentrated source of energy for human nutrition. The term fat covers a surprisingly large number of chemical substances, very differently structured, whose molecules are dominated by methylene-based chains, so their main property is poor solubility in polar solvents (water) and good solubility in non-polar solvents . (Handbook on Improvers and Other Raw Materials for Baking and Confectionery, 2007). Various fats can be used in the production of tea cakes, whether natural, hydrogenated or emulsified.

We know that apart from flour, the main raw materials used in the production of tea cakes are fat and sugar. Fats and oils are esters of higher saturated and unsaturated fatty acids and glycerol. There are different divisions according to which we divide fats and oils. Division according to chemical composition:

- Solids (fats),
- Liquid (oil),
- Grease with lubricating consistency.

Division by origin:

- animals,
- plant.

Vegetable fat

In a dough made of flour, water and fat, the fat is spread out in thin layers and binds through hydrophobic bonds to the hydrophobic bonds of proteins and flour. The fat has the ability to regulate the behavior of the dough through the properties of plasticity and the ability to absorb air bubbles. Nonpolar fat triglycerides act as softeners and affect dough consistency. (Gavrilović, 2000). The plastic properties of cooking fats have an important function during dough cooking. The solid phase of triglycerides affects the reduced strength of the structural organization of the gluten complex, while the liquid phase of triglycerides affects the mobility of the dough. Fat reduces dough shrinkage during mechanical processing because it reduces the tension that leads to deformation of the part of the dough shape. When kneading the dough, the order of adding the fat and water is important because it has been proven that the simultaneous addition of fat and water to the flour contributes to optimal dough development. The fat is dispersed between the flour particles, allowing water to enter and hydrate the protein and starch. As the heat increases during cooking, part of the fat, due to its plastic (especially shortening) properties, slowly passes into the liquid phase, which has a favorable effect on the hydration process. If the fat is not plastic enough, it will melt as the heat rises during cooking. The liquid phase is dispersed over the surface of the flour particles, which prevents water from coming into contact with the flour, which slows down the swelling of the gluten protein. In the dough, the fat is in contact with flour enzymes, drying agents, acids and

other raw materials and a smaller or larger amount of water. This is precisely the reason why the dough is the environment in which the chemical change of the fat in the processes of hydrolysis or oxidation can take place. The consequence of this is the breakdown of the fat and at the same time the breakdown of the product itself, i.e. the tea paste. The chemical properties of the fat should not change during mixing, processing and baking. To prevent unwanted spoilage of the product, the fat must have the necessary stability and ability to be preserved throughout the technological process of production and stability of tea cakes and other similar products. (Gavrilović, 2000). H1: Biscuits contain healthy substances for human health.

Butter

Butter is a product obtained by extracting milk fat from the fatty phase of milk - cream. According to the Regulation on Lubricating Fats (Regulation on Lubricating Fats, NN No. 41/2012), milk fats are products in the form of a solid, plastic emulsion that is obtained exclusively from milk or other milk products. Butter is a product with a milk fat content of at least 80% and a maximum of 90%, water content of a maximum of 16% and a maximum of 2% nonfat milk solids. The butter production process can be continuous or discontinuous. The interrupted process is older and in this process butter is produced from sweet sauce and sour cream from the accumulation of fat globules. The continuous process of butter production is a newer process and with this process mostly butter is obtained from sweet cream. The energy value of 100 g of butter is about 700 kcal/3000 kJ. It contains fat-soluble vitamins such as A, D, E and K, and the provitamin of vitamin A, ß-carotene, from which the yellow color of butter originates. (Tratnik, 2012) Butter is certainly the most popular fat in the cookie industry, but due to its high price, it is used exclusively in the production of high-quality cookie products.

Sugars

Often, the name sugar actually refers to sucrose obtained from sugar beets or sugar cane. Sucrose is a non-reducing disaccharide whose main units are glucose and fructose. Glucose and fructose are linked to each other by carbonyl groups. (Afoakwa, E. O., 2010) It is common for raw sugar to contain 95% sucrose while refined table sugar contains approximately 99.8% sucrose. Table sugar contains at least 99.6% sucrose. (Micic, 1976).

During the kneading of the dough, the role of sucrose is to reduce the osmotic activity of the water, where the gluten swells more slowly, therefore the process of forming the dough is slower. During the mixing, strong resistances appear, which can be shown with a farinogram. If sucrose is present in a proportion of 15 to 30% of the flour, this affects the intake of a smaller amount of gluten in the dough. If the moisture content of the dough is below 25%, it is preferable to use powdered sugar whose maximum particle size is 100 μm. The advantage of powdered sugar is that it dissolves faster during the cooking of the dough. Finely ground powdered sugar, with particles of a maximum size of 30 μm, is used in the preparation of fat fillings. In fat filling for tea cakes, the fat is spread over the surface of the sugar particles and additives, which prevents moisture absorption and recrystallization of the sugar.

Growth tools

The idea of using baking powder instead of yeast is 150 years old, and Justus von Liebig was the first to solve this problem in Germany. He produced bread whose structure was filled with sodium carbonate and hydrochloric acid. This laid the foundation for the production of baking powder as well as other chemical growth agents. (Handbook on improvers and other raw materials for baking and confectionery, 2007) In the production of cookies and similar products, chemical and biochemical dough-raising agents are used as additives. The biochemical agent for dough growth is baker's yeast (Saccharomyces cerevisiae), while the most commonly used chemical agents are ammonium hydrogen carbonate and sodium hydrogen carbonate (sodium bicarbonate). The role of chemical leavening agents in cookie dough is manifold. Chemical agents change the pH of the dough medium, prevent the sticking of the dough, affect the change of the rheological properties of the dough, and because of all this it is possible for the individual dough to be thinned during mechanical processing. (Gavrilović, 2003) Sodium hydrogen carbonate (sodium bicarbonate, NaHCO3) creates a

smaller amount of carbon dioxide in dough and mass at about 60°C and without an acid carrier. Sodium hydrogencarbonate is a white crystalline powder, with a weak odor and a slightly alkaline-salty taste. (Gavrilović, 2003). Sodium carbonate (soda) is produced as a by-product. Sodium bicarbonate can be found on the market in different grains. It is very difficult to dissolve in water (coarser particles, >0.15 mm), so they can remain in the dough or mass and thus cause changes in the color of the center of the product. Finely ground sodium bicarbonate (particle size <0.15 mm in diameter) is used for doughs that are mixed for a short time (less than one minute). Sodium bicarbonate is added to the cookie dough in the amount of 2 to 6 g/1 kg of flour, hydrogen carbonate, etc. The main role of other additives such as salt is to correct the taste of the product, while the role of other raw materials is to obtain a homogeneous dough, to form a color, to adjust the balance of relative humidity, freshness and the roundness of the product's aroma. (Gavrilović, 2003) All raw materials in the composition of the dough for tea pastries must be determined, that is, their purpose, as well as their quality, must be determined. For this reason, it is necessary to use comparative methods. H2: Pi & Ki Biscuits consumption is very popular to the consumes.

3. HYPOTHESIS

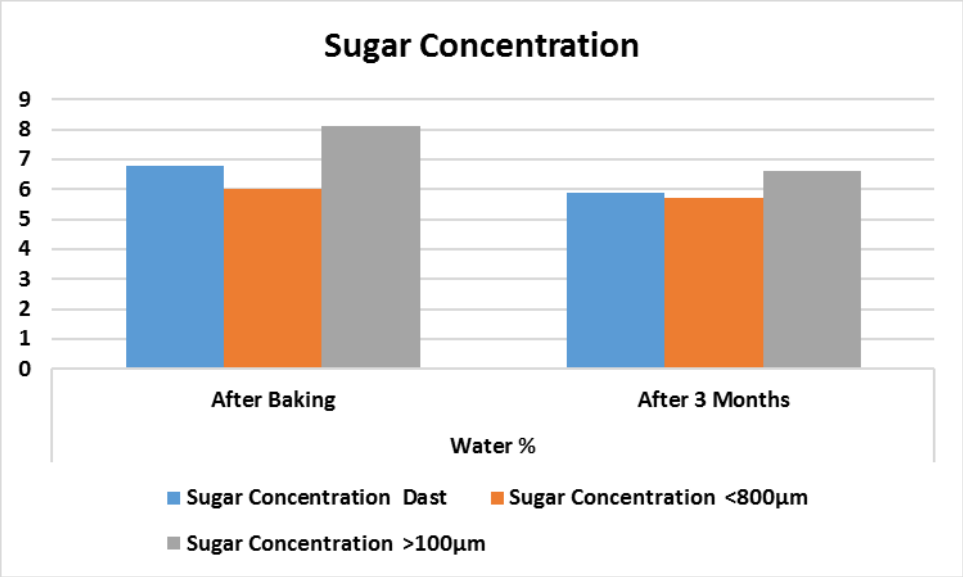
In the future food industry, preparation and production processes will be heavily automated, utilizing advanced technologies such as robotics, AI, and 3D printing. This automation will lead to increased efficiency, consistency, and customization options in food production industry while also reducing labor costs and minimizing human error. Additionally, there will be a greater focus on sustainable ingredients and production methods to meet the growing demand for environmentally friendly food products. As consumer preferences shift towards healthier options, there will be innovations in food recipes to include functional ingredients like probiotics, vitamins, and plant-based proteins, catering to diverse dietary needs and preferences. Furthermore, personalized food manufacturing may become more prevalent, allowing consumers to customize ingredients, flavors, and shapes through online platforms or in-store kiosks, thus enhancing consumer engagement and satisfaction.

4. METHODOLOGY

This research was carried out based on the review of the literature and Pi&Ki in Egi group - Zahaq Pejë. For this research, scientific works from various medical fields that have addressed the topic of the diploma have been taken as a source. Developing a robust methodology is crucial for conducting a research on preparation and production in the future food industry. We determine the type of qualitative and quantitative method through research approach experimental, survey, case study and literature review. We specify the scope of the objectives ensuring the alignment research problem.

5. FINDINGS

In the future food industry preparation and production processes are likely to undergo significant advancements to meet evolving consumer demands, improve efficiency, and address sustainability concerns. Here are some potential findings regarding the future of tea cakës production:



Graph 1: Average values of determination of water content depending on granulation of sugar after roasting and after 3 months of storage of tea paste samples, regardless of roasting temperature and $NaHC0_3$ content.

In the table 4: Change in activity and water content of tea cakes after baking and after storage depending on granulation of sugar, regardless of baking temperature and sodium bicarbonate content.

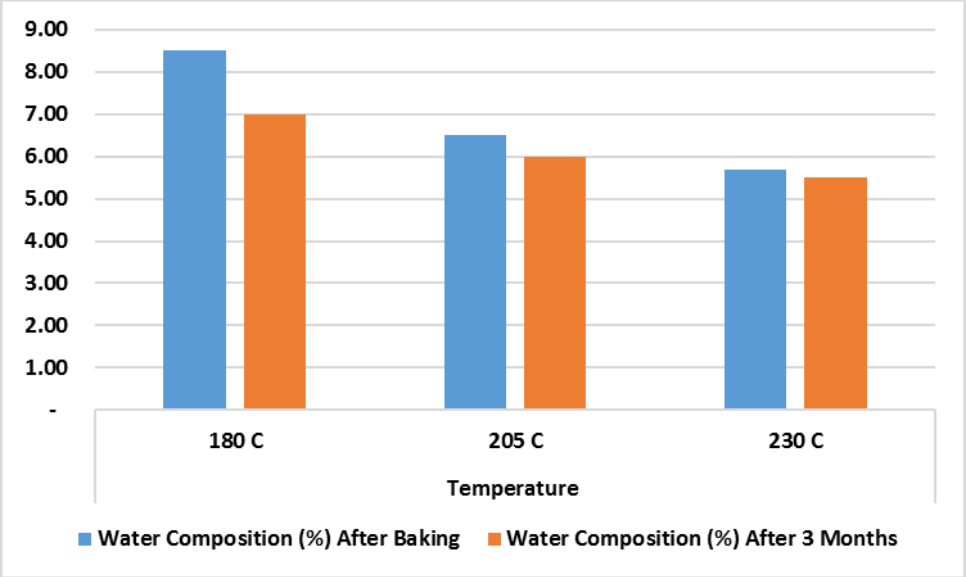
Sugar Concentration	Δ Proportion of Water (%)		Δ Activities	
Dast	0,38 ± 0,44	b	0,013 ± 0,010	a
<800µm	0,26 ± 0,28	b	0,012 ± 0,017	a
>1000µm	1,50 ± 1,55	a	0,020 ± 0,024	a

Data presented are mean values ± standard deviation; values marked with the same letter in the same column are not statistically different ($p<0.5$) according to Fischer's LSD least significant difference test.

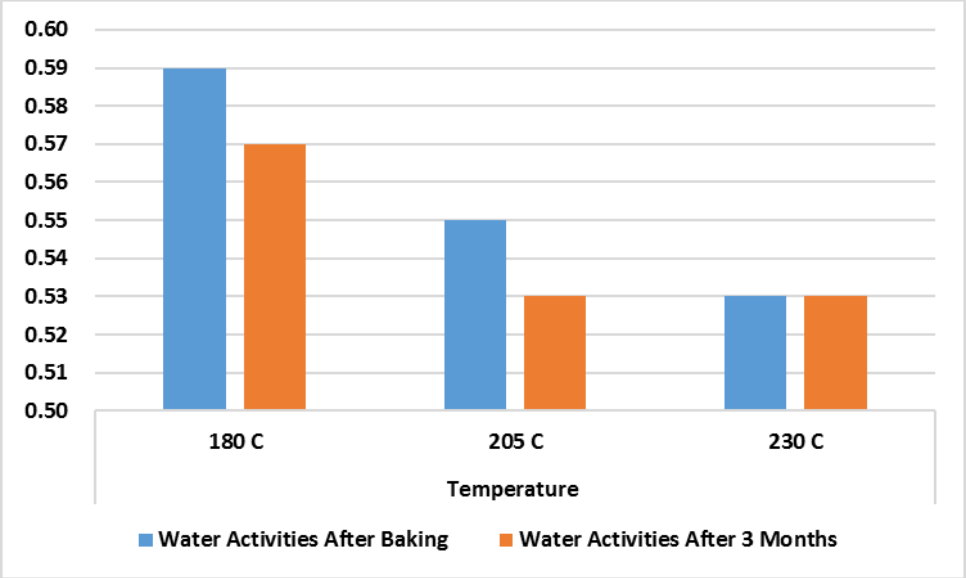
Table 5: Change in activity and water content of tea cakes after baking and after storage depending on sodium hydrogen carbonate content, regardless of sugar granulation and baking temperature.

NaHCO3 (%)	Δ Water (%)		Δ Activities	
0.67	0,80 ± 0,97	a	0,022 ± 0,024	a
1,11	0,76 ± 1,05	a	0,017 ± 0,016	a
1,56	0,58 ± 0,76	a	0,006 ± 0,005	a

Data presented are mean values ± standard deviation; values marked with the same letter in the same column are not statistically different ($p<0.5$) according to Fischer's LSD least significant difference test.



Graph 2: Average values of water content determination depending on the applied baking temperature, after baking and after 3 months of storage of tea cake samples, regardless of NaHCO3 content and sugar granulation.



Graph 2: Average values of water activity determination depending on the applied roasting temperature, after roasting and after 3 months of storage of tea paste samples, regardless of NaHCO3 content and sugar granulation.

Table 6: Change in activity and water content of tea cakes after baking and after storage depending on baking temperature, regardless of sodium bicarbonate content and sugar particle.

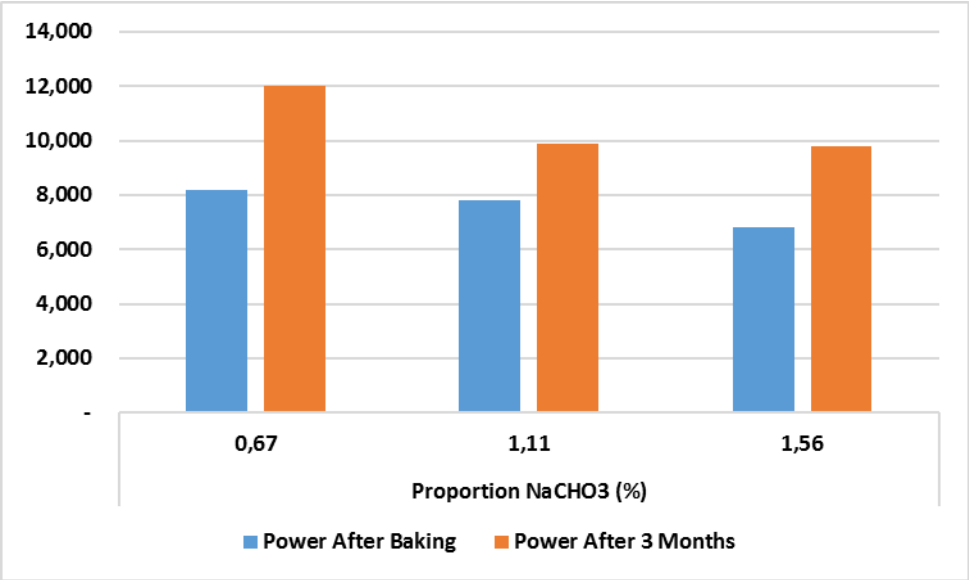
Temperature (C)	Δ Water (%)		Δ Activities	
180	1,41 ± 1,12	a	0,017 ± 0,021	a
205	0,48 ± 0,58	b	0,014 ± 0,017	a
230	0,26 ± 0,44	b	0,014 ± 0,016	a

Data presented are mean values ± standard deviation; values marked with the same letter in the same column are not statistically different ($p<0.5$) according to Fischer's LSD least significant difference test.

Table 7: Change in the parameters determined by the texture analysis of the tea paste after roasting and after storage depending on the sugar particles, regardless of the roasting temperature and the proportion of sodium bicarbonate.

Sugar Concentration	Δ Power (g)		Δ Fragility (mm)		Δ Cutting work (gsec)	
Dast	997 ± 2711	a	1,27 ± 0,41	a	7563 ± 3020	a
<800µm	1767 ± 1956	a	0,92 ± 0,61	a	5203 ± 2575	b
>1000µm	5224 ± 5225	b	0,50 ± 0,28	c	285 ± 588	c

Data presented are mean values ± standard deviation; values marked with the same letter in the same column are not statistically different (p<0.5) according to Fischer's LSD least significant difference test.



Graph 3: Average strength values depending on the proportion of NaHCO3, after roasting and after 3 months of storage of tea paste samples, regardless of roasting temperature and sugar granulation.

Table 8: Change in the parameters determined by the analysis of the structure of the tea paste after roasting and after storage depending on the proportion of sodium hydrogencarbonate, regardless of the sugar particle and the roasting temperature.

NaHCO3 (%)	Δ Strenght (g)		Δ Fragility (mm)		Δ Cutting work (gsec)	
0,67	3679 ± 1579	a	1,23 ± 0,21	a	-4080 ± 2751	a
1,11	2096 ± 2502	a	0,82 ± 0,57	ab	-4388 ± 2587	a
1,56	3060 ± 1725	ab	0,74 ± 0,77	b	-4581 ± 2328	a

Table 9: Change in the parameters determined by the analysis of the structure of the tea paste after roasting and after storage depending on the roasting temperature, regardless of the proportion of sodium bicarbonate and sugar granulation.

Temperature (C)	Δ Strenght (g)		Δ Fragility (mm)		Δ Cutting work (gsec)	
180	7967 ± 1832	a	1,75 ± 0,21	a	-424 ± 332	a
205	779 ± 1089	b	0,73 ± 0,15	b	-6351 ± 1362	b
230	88 ± 961	b	0,21 ± 0,26	c	-6275 ± 2280	b

Data presented are mean values ± standard deviation; values marked with the same letter in the same column are not statistically different (p<0.5) according to Fischer's LSD least significant difference test.

Table 10: Results of statistical analysis of changes in diameter, thickness and coefficient of expansion of tea cakes after baking and after storage depending on granulation of sugar, regardless of baking temperature and proportion of sodium bicarbonate.

Sugar Concentration	Δ Diameter (cm)		Δ Thickness (cm)		Δ Expansion Coefficient	
Dast	0,22 ± 0,09	a	-0,05 ± 0,019	a	4,47 ± 1,71	a
<800μm	0,17 ± 0,04	a	-0,07 ± 0,021	b	4,79 ± 1,18	a
>1000μm	0,11 ± 0,10	b	-0,080 ± 0,022	b	4,57 ± 1,55	a

Data presented are mean values ± standard deviation; values marked with the same letter in the same column are not statistically different (p<0.5) according to Fischer's LSD least significant difference test.

Table 11: Results of statistical analysis of changes in diameter, thickness and expansion coefficient of tea cakes after baking and after storage depending on the proportion of sodium hydrogen carbonate, regardless of sugar granulation and baking temperature.

NaHCO3 (%)	Δ Diameter (cm)		Δ Thickness (cm)		Δ Expansion Coefficient	
0,67	0,25 ± 0,15	a	-0,04 ± 0,01	a	4,14 ± 1,43	a
1,11	0,12 ± 0,11	b	-0,07 ± 0,03	b	4,77 ± 2.03	a
1,56	0,12 ± 0,05	b	0,07 ± 0,03	b	4,92 ± 1,00	a

Data presented are mean values ± standard deviation; values marked with the same letter in the same column are not statistically different (p<0.5) according to Fischer's LSD least significant difference test.

Table 12: Results of statistical analysis of changes in diameter, thickness and coefficient of expansion of tea cakes after baking and after storage depending on baking temperature, regardless of the proportion of sodium bicarbonate and sugar granulation.

Temperature (C)	Δ Diameter (cm)		Δ Tile (cm)		Δ Expansion Coefficient	
180	0,17 ± 0,06	a	-0,07 ± 0,03	b	5,16± 1,90	a
205	0,17 ± 0,04	a	-0,05 ± 0,02	a	4,11 ± 1,57	b
230	0,16 ± 0,09	a	-0,07 ± 0,02	b	4.56 ± 1,17	b

Data presented are mean values ± standard deviation; values marked with the same letter in the same column are not statistically different (p<0.5) according to Fischer's LSD least significant difference test.

6. DISCUSSION

The topic presents the results of the analysis of a total of 15 batches of tea paste mixtures (excluding preliminary research) and the following parameters were monitored: texture of tea pastes after baking and after storage, color change, then height and length of baking and stored tea pastes, and changes in size and water activity after roasting and storage. Figures 4 and 5 and table 3 show the results of determining the water content and activity of tea paste samples depending on the granulation of sugar after baking and storage. The statistically processed results of the change in water content after baking and storage of tea paste samples depending on sugar granulation, regardless of baking temperature and sodium hydrogen carbonate content (table 3) show that a statistically significant difference (p <0.05) the difference in water content was found between samples prepared with sugar granulation >1000 μm (S1000) and samples prepared with the other two granulated sugars (powdered sugar, SP and sugar granulation <800 μm, S800) . The samples prepared by SP and S800 are not statistically different throughout the storage time according to Fisher's LSD test of significant difference. The statistically processed results of the change in water activity, after ripening and storage, show that all the tested samples regarding sugar granulation (SP, S800, S1000) do not differ statistically significantly according to Fisher's LSD test with the least important difference. The results of monitoring the changes in the proportion and activity of water after baking and storage of the tea cake samples in relation to the different proportions of NaHCO3 (Figure 6, Figure 7, Table 4) showed, after statistical analysis, no statistically significant difference (p< 0.05) according to Fisher's LSD test, the least significant difference. The change in water content after baking and storage of tea paste samples at

different temperatures (Figure 8, Figure 9, Table 5) showed that there is a statistically significant difference ($p<0.05$) in the change in water content between the samples of baked at 180 °C and samples baked at 205 °C and 230 °C. Between the samples baked at 205 °C and 230 °C there is no statistically significant difference ($p<0.05$) for the values of water content change according to Fisher's LSD test of significant differences.

The results of the statistical processing of the water activity change showed that all tested samples statistically do not differ significantly according to the Fisher's LSD test, with the least significant difference considering the applied baking temperatures. The downward trend shown by the results of water content and activity during storage is in accordance with the results published by Antonio Piga and co-workers, where the samples were stored for 35 days also in PVC bags. Figures 10 and 11 and 12 show the data obtained from the determination of durability, brittleness and shear performance of the tested samples that were baked with different granulations of sugar (SP, S800, S1000) after baking and storage. From the results it is evident that the strength and brittleness increased, and the shear work decreased after storage. Statistical analysis of changes in parameters determined by texture analysis (table 6) showed that SP and S800 baked samples were not statistically significantly different from each other ($p<0.05$) according to Fisher's LSD test, the least significant difference in stability, depending on sugar granulation, regardless of sodium bicarbonate proportion and baking temperature, while samples baked with S1000 are statistically different from the other two according to Fisher's LSD test, the least significant difference in strength is independent of the percentage of sodium bicarbonate and baking. the temperature. The results presented in table 6 showed that the change in brittleness and cutting performance of the tested samples after 3 months of storage was statistically significant ($p<0.05$), according to Fisher's LSD test the least significant difference depends on the granulation of sugar applied to sample mixture, regardless of sodium bicarbonate proportion and baking temperature. Figures 13, 14 and 15 and table 7 show the results obtained from the measurement of strength, brittleness and shear work, as well as the results of statistical analysis of the change in strength, brittleness and shear work after storage in relation to different proportions of $NaHCO3$. The results of determination of strength (Figure 13) and fragility (Figure 14) show an increase in the value of these parameters after storage. Statistical analysis (table 7) shows that the samples with 0.67% and 1.11% $NaHCO3$ are statistically different from each other ($p<0.05$) according to Fisher's LSD test, less significant in the change in strength, regardless of the applied annealing temperature. and granulated sugar. The highest values of strength change after 3 months of storage were shown by the samples with the lowest $NaHC03$ content. The results of the statistical processing of the change in fragility (table 7) show that the samples with 0.67% $NaHCO3$ and 1.56% $NaHCO3$ are statistically different according to Fisher's least significant difference LSD test.

The results of the statistical processing of the change in fragility (table 7) show that the samples with 0.67% $NaHCO3$ and 1.56% $NaHCO3$ are statistically different according to Fisher's least significant difference LSD test. The samples with the lowest $NaHCO3$ content (0.67%) had the highest values of brittleness change after storage, in relation to the $NaHCO3$ content, regardless of baking temperature and sugar granulation. The values of cutting work (Figure 15) depending on the proportion of $NaHCO3$ decreased after storage, and the statistical analysis of the change of cutting work depending on the proportion of $NaHCO3$, regardless of the baking temperature and sugar granulation, shows that all the tested samples are not statistically significantly different according to Fisher's LSD Least Significant Difference test at work cut. Figures 16 and 17 and 18 show the results of determination of strength, brittleness and work in shear in the tested samples depending on the baking temperature, after baking and after 3 months of storage, regardless of $NaHCO3$ content and sugar granulation. The samples annealed at 180 0C had the greatest stability after storage, and the results of the statistical analysis (table 8) showed that these samples differ statistically significantly ($p<0.05$) from the samples annealed at 205 0C and 230 0C, while the samples annealed at 205 0C and 230 0C are not statistically different from each other according to Fisher's LSD test, the least significant difference in strength considering the baking temperatures of the tea paste samples. Values for fragility (Figure 17) after 3 months of storage increased in all samples baked at different temperatures, and the highest value of change in fragility after storage (table 8) was the samples baked at 180 0C, while the increase

minimal change in brittleness was observed from samples baked at 230 0C. The results of statistical analysis showed that all samples baked at different temperatures are statistically different from each other ($p<0.05$) according to Fisher's LSD test with the least significant difference in brittleness. The average values of cutting work depending on the baking temperature showed a decrease in the value of all tested samples after 3 months of storage (Figure 18). Samples annealed at 180 0C had the least change in shear work values after storage, and these samples are statistically significantly different from samples annealed at 205 0C and 230 0C according to Fisher's LSD test, the least significant difference, regardless of the percentage of sodium hydrogen carbonate and sugar granulation (table 8.). Figures 19 - 26 show the measurement results of length (d), height (h) and calculated coefficient of expansion of tea cakes after baking and after 3 months of storage. The results showed a decrease in height and an increase in length and coefficient of expansion after storage. The results of measuring the length, height and expansion coefficient of tea cakes depending on different sugar particles, after baking and after 3 months of storage, regardless of the proportion of NaHCO3 and baking temperature, are shown in figures 19, 20 and 21, and the results of the statistical analysis of the change in length, height and expansion coefficient after storage in table 9. The statistical analysis showed that the samples prepared with granulated sugar SP and S800 are not statistically different from each other ($p<0.05$) and that they differ statistically significantly according to Fisher's LSD test of least significant differences from samples prepared with granulated sugar S1000 taking into account the change in length (diameter) of the samples after storage.

In addition, statistical analysis showed that after storage at a change in altitude, samples prepared with powdered sugar (SP) differ statistically ($p<0.05$) from samples prepared with S800 and S1000 sugar according to Fisher's LSD test with the least significant difference (table 9.) Statistical processing of the calculated results of the change in the coefficient of expansion of the tea cake after 3 months of storage shows that there is no statistically significant difference ($p<0.05$) according to the Fisher's LSD test, the most significant difference little important. in relation to sugar granulation, regardless of the proportion of NaHCO3 and the baking temperature (table 9). Figures 22, 23, 24 show the results of the length, height and expansion coefficient of baked tea cakes depending on the different proportion of NaHCO3, after baking and after 3 months of storage of the samples, regardless of the sugar particle and baking temperature . The results of the statistical analysis of the change in length, height and expansion coefficient of tea cakes after storage depending on the NaHCO3 content are shown in Table 10. The largest change in length and the smallest change in height after storage were the cake of tea samples with the lowest concentration of NaHCO3 (0.67%) and were statistically significantly different ($p<0.05$) from the samples with 1.11% and 1.56% NaHCO3 according to Fisher's LSD test with the least difference important (table 10).

All samples with different proportions of NaHCO3 were not statistically different from each other ($p<0.05$) according to Fisher's LSD least significant difference test regarding the change in expansion coefficient after storage (table 10). Figures 25, 26 and 27 show the results of the length, height and coefficient of expansion of baked samples of tea cakes depending on the baking temperature, after baking and after 3 months of storage of the samples, regardless of the content of NaHCO3 and sugar particle . . The results of the statistical analysis in Table 11 showed that all the tested samples are not statistically significantly different from each other ($p<0.05$) according to Fisher's LSD test, the least significant difference in relation to the applied baking temperature in the change in length and expansion coefficient after storage, and that the samples baked at 205 °C are statistically different from the samples baked at 180 °C and 230 °C according to Fisher's LSD test, the least significant difference in height change after storage.

7. CONCLUSION

In conclusion, the future of preparation and production in the food industry is poised for significant transformation driven by technological advancements and evolving consumer preferences. After research and analysis of all the parameters of the tested tea paste samples, after 3 months of storage, the following conclusions were reached:

- The water content and activity after storage of the tested tea cake samples decreased.

- The change in water activity after storage was not statistically significant neither in the samples with different sugar particles, nor in the samples with different sodium hydrogencarbonate content, as well as taking into account the applied baking temperatures. The biggest change in water content was found in samples prepared with sugar with granulation over 1000 μm and those baked at 180 °C.

- Textural properties of strength and brittleness increased after storage, while shear work values decreased.

- The largest changes in strength and brittleness after storage had the samples with the lowest content of sodium hydrogen carbonate (0.67%) baked at 180 °C. Considering the granulation of sugar, the biggest difference in strength was shown by samples with sugar granulation over 1000 μm, and the biggest difference in brittleness by samples prepared with powdered sugar. - The calculated coefficient of expansion of the tea paste samples, as well as the measured length values increased after storage, while the height of the tea paste decreased due to all three parameters that changed during the preparation of the samples (granulation of sugar, sodium bicarbonate content and baking temperature).

- The changes in the length of the tea paste were the least in the samples prepared with powdered sugar, with the lowest sodium hydrogen carbonate content (0.67%) and the applied baking temperature of 180 °C. The biggest changes in height were recorded in the samples prepared with sugar granulation over 1000 μm.

- The statistical analysis of the change in the coefficient of expansion of the tea paste samples showed the absence of a statistically significant difference in relation to the granulation of sugar, the percentage of sodium bicarbonate and the three applied baking temperatures.

- The results of determining the total color change showed that with an increase in the baking temperature of the samples prepared with granulated sugar less than 800 μm, the difference in the total color change decreases, in all three tested concentrations of sodium hydrogencarbonate

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THE IMPORTANCE OF ORGANIZATIONAL CULTURE IN THE PERFORMANCE OF FAMILY HEALTH UNITS – MODEL B IN THE ALGARVE REGION

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Abstract: Context and Objectives: The recent reform of Primary Health Care brought about important developments, such as the creation of the Health Care Clusters and the Family Health Units, which are innovative in terms of health care provision, with a focus on improving access to care, health and disease management, efficiency and effectiveness gains, quality of care, and user satisfaction. Increasingly considered as an essential organizational attribute for the success of organizations, knowing the organizational culture that prevails in family health units is essential for the implementation of a new work culture in Family Health Units (FHUs) with a type B management model, which is characterized as a more rigorous management model in terms of team performance, clinical governance, and teamwork. Using the Contrasting Values Model as theoretical support, this study aimed to analyze the importance of the Organizational Culture in the Performance of FHUs with a type-B management model in the Algarve region. **Methodology:** A quantitative cross-sectional study was conducted with a sample of 109 professionals from eight type-B FHUs. The Organizational Culture Assessment Instrument (OCAI) was used to identify the predominant type of organizational culture in the FHUs, and, in order to characterize the level of performance of model B FHUs, data were extracted from the Primary Health Care Identity Card. **Results:** In the model B FHUs in the Algarve region there is a predominance of the Clan type culture. Organizations with this type of culture remain cohesive due to the loyalty and tradition among their members. Knowledge of the current organizational culture in these units helps to raise awareness of their own culture, helping their leaders to develop and implement projects oriented towards high performance and productivity. Success is defined in terms of teamwork and concern for people. **Conclusion:** The study points to a predominance of the Clan culture in the analyzed FHUs, with emphasis on the existence of a productive and competitive leader.

Keywords: Organizational Culture; Primary Health Care; Family Health Units; Performance

1. Introduction

The provision of healthcare is a prime necessity. In this sense, we are compelled to be attentive to the changes occurring in this domain. In Portugal, we have witnessed a structural reform in this area, and more specifically in Primary Health Care (PHC), which was realized with the creation of Family Health Units (Baganha, Ribeiro and Pires, 2002). For these organizational changes to happen, it is important to understand the organizational culture, since it contributes to comprehending the phenomenon and the values of individuals and the group. In this sense, identifying the elements of culture assists in implementing the strategy, objectives and modus operandi of organizations (Lourenço, 2016). According to Leone, Dussault and Lapão (2014), the reform of Primary Health Care promoted the implementation of a new work culture, through closer management and incentives for clinical governance, countering anachronistic, excessively centralized and bureaucratic practices of public administration. The necessary cultural changes, with regard to healthcare provision, are condensed by Loyd (2001) into two aspects: the importance of teamwork and partnership; the need for rigorous performance management. Research in the area of organizational culture provides knowledge about its role in the success or failure of organizations, in the ability to attract and retain talent, as well as how it affects the performance, behavior, morale and well-being of an organization's workers (Chatman & O'Reilly, 2016; Warrick, Milliman, & Ferguson, 2016). Knowing the organizational culture is a key factor in understanding the capacity of individuals and groups to overcome the problems arising from the many adverse circumstances of daily life that occur in workplaces (Rocha, Gaioli, Camelo, Mininel, & Vegro, 2016). It is also a central factor in understanding how organizations function (Chatman & O'Reilly, 2016) and in comprehending all aspects of an organization's life (Alvesson, 2002). However, knowing the organizational culture (and its theory), more than teaching what to do, can help to know what not to do, and to be prepared for problems resulting from cultural clashes (Alvesson, 2002). As advocated by Cameron and Quinn (2006), knowing the central values of the organizational culture can be a useful tool for the effective management of organizational change.

In this context, the present work sought to understand and analyze the importance of Organizational Culture in the Performance of Family Health Units (model B) in the Algarve region. Given what several authors advocate (Cameron & Quinn, 2006; Schein, 2009) and the different studies conducted on the importance of culture in the performance of health organizations, one of the primary steps for introducing organizational changes is the identification of the type of organizational culture. In this sense, the diagnosis of the organizational culture from the perceptions of professionals who are part of the Family Health Units-model B, allowed the identification of the current organizational culture and assisted in recognizing the culture that these professionals consider should be developed to meet internal and external demands. The Model B Family Health Units (USF-B) are the units with a higher Global Performance Index (IDG), consisting of teams with greater organizational maturity, where teamwork in family health is an effective practice and where contracting requires higher performance than the previous model. Thus, the USF-B intend to allocate more effective services, with greater ability to achieve high levels of performance, adapted to the new demands that are imposed and at the same time achieve a high IDG. Given that the IDG is centered on the Continuous Improvement Plan, which aims to apply a set of corrective measures and promote change, it has become essential to understand whether the organizational culture that predominates in the Model B USFs meets the requirements of its management model, with a view to defining strategies that promote organizational change.

2. Literature Review

2.1. Primary Health Care

According to the Portuguese Observatory of Health Services, Primary Health Care (PHC) plays an important role in disease prevention, health promotion and reducing existing inequalities in terms of health in the Portuguese population (OPSS, 2018). These care services are provided in Health Centers (CS), whose importance is vital for the population, although they are often undervalued in relation to hospital care. PHC must meet society's expectation

that demands more from health systems at the citizen, family and community level, imposing greater equity in health, with quality services, centered on people's needs (WHO, 2008). The units most focused on personalized medical and nursing care are the USFs (family health units) and the UCSPs (personalized health care units); the USPs (public health units), which function as health observatories, being responsible for, among other things, preparing information and plans in the areas of public health, epidemiological surveillance, intervention programs in the area of prevention, promotion and protection of population health; the URAPs (shared care resource units) that integrate social workers and psychologists, physiotherapists, occupational therapists, among others, who provide care consultancy services to all other functional units; and the UCCs (community care units), created with the ACESs in article 11 of Decree-Law no. 28/2008 of February 22, these are defined as providers of health care and psychological/social support at home and in the community.

2.2. Family Health Units

The 21st Constitutional Government established the defense of the National Health Service (SNS) as a priority and, in this context, identified the need to reinforce Primary Health Care (PHC) and create more Family Health Units (USF), with the purpose of contributing to realize the centrality of the PHC network in the country's health policy and, thus, expand and improve its response capacity through all the Functional Units (UF) that constitute the Groups of Health Centers (ACES) (Order No. 1174-B/2019). One of the measures of the PHC reform consists of the creation of USFs. Family Health Units (USFs) can be defined as elementary units for the provision of individual and family health care, based on multiprofessional teams, consisting of doctors, nurses and administrative staff, and which can be organized into three development models: A, B and C. These models are distinguished by the level of autonomy, the remuneration and incentive system for professionals, as well as the form of financing and respective legal status (MS, 2007). With regard to Model A, this is based on a management model that is in a "learning and improvement phase of the family health team work", initiating the practice of internal contracting (Order nº 24101/2007, p. 30419). Model B is characterized by integrating "teams with greater organizational maturity, where work in a family health team is an effective practice", and where contracting requires greater performance than the previous model (Order nº 24101/2007, 30419). Model C is characterized by the existence of a program contract and may integrate teams from the public sector or belonging to the private, cooperative or social sector. USFs are thus subject to continuous evaluation, with the Regional Health Administration being responsible for monitoring and evaluation. USFBs are units that transitioned from model A, after applying on their own initiative. Model B is indicated for teams with greater organizational maturity, where work in a family health team is an effective practice, whose professionals are willing to accept a more demanding level of performance contracting and participation in the USF accreditation process, within a maximum period of three years. It covers public administrative sector USFs with a special remuneration regime for all professionals, including base remuneration, supplements and performance compensation (Order 24101/2007). These present better results than those of model A (Biscaia, 2014). According to the Primary Health Care Identity Card (BI CSP), in Portugal, at the end of 2020, there were 274 USFs, with 149 USFs in the Northern Regional Health Administration, 32 in the Central Regional Administration, 77 in the Lisbon and Tagus Valley Regional Administration, 8 in the Alentejo Regional Administration and 8 in the Algarve Regional Administration. In the specific case of the Algarve region, the Algarve Regional Health Administration has three ACES, namely Central, Barlavento and Sotavento.

2.3. Organizational Culture

According to Alvesson (2002), organizational culture is one of the most important themes in academic research and management practices, since cultural dimensions occupy a central place in the life of organizations. Organizational culture is an unconscious and implicit set of beliefs, traditions, values, customs, expectations and shared habits, often unspoken, that characterize a peculiar group of people (Leavitt, 1996; Sathe, 1983). Organizational values are defined as hierarchically organized principles or beliefs, relating to types of structures or

models of desirable behaviors that guide the life of the organization and serve individual, collective or mixed interests. Thus, it becomes essential to assess organizational values, since they have great relevance for organizational culture (Domenico and Teixeira, 2002). Mintzberg (2004) considers that the manager must be aware that the culture most appropriate for their organization must reflect the appropriate instruments and models to deal with the setbacks of their organization and its adaptation to the context, resizing its resources, redefining its strategy, philosophy and policy from a perspective of evolution, adaptation and survival. This is because organizational culture can modify the organizational structure of a company. Culture can thus represent a competitive advantage in organizations, especially when there is a set of common and consensual perceptions that integrate memories, values, attitudes and definitions. Managers must have the ability to identify the type of culture of the organization, the type of approaches that should be implemented to change the culture, in order to achieve different results (Ferreira, 2011).

2.4. The Competing Value Model

The Competing Values Model by Cameron and Quinn (2006) was the organizational culture assessment model chosen for this study. Considering the concepts and different perspectives on organizational culture, this theoretical model fits within the sociological and functional perspective and the possibility of diagnosing and measuring organizational culture, since the goal is to study how the structure of contrasting values manifests itself in the organization's behavior. To understand the different dimensions of organizational culture, various models have been formulated, represented in the form of a typology that groups and classifies the types of culture. Typologies assume that organizations can be characterized by a set of common characteristics or dimensions, enabling comparison between organizations (Bilhim, 2004). In addition to this advantage, using typologies to conceptualize organizational culture makes it possible to express the contrasts and paradoxes that organizations deal with and must reconcile, while also allowing for the development of monitorable intervention plans in terms of diagnosis, intervention, and control. Cameron and Quinn (2006) present a theoretical model called the Competing Values Framework, based on an empirical study conducted in various organizations. An instrument was developed - the Organizational Culture Assessment Instrument (OCAI) - which allows for diagnosing the current organizational culture and assisting in recognizing the culture that members of the organization consider should be developed to meet internal and external demands. The same authors state that each culture is composed of a unique language of symbols, rules, and ethnocentric feelings, which are represented in four types of cultures, namely: Clan Culture; Adhocracy Culture; Hierarchical Culture; and Market Culture. These four cultures are identified by means of six key dimensions of organizational culture: Dominant Characteristics; Organizational Leader; Management Styles; Organizational Principle; Organizational Climate; and Criteria for Success. These six dimensions, in turn, portray how the organization operates and the values that characterize it. The “Clan Culture” is characterized by considering workers as partners and the organization being concerned with developing a healthy work environment. It encourages teamwork, and leaders play a role in encouraging employee participation. The “Adhocracy Culture” is represented by the concepts of entrepreneurship and dynamism. Companies of this type are dynamic, and leaders stimulate creativity and innovation. The “Hierarchical Culture” is characterized by stability, control, and efficiency. The work environment is formal and structured, and the organization is concerned with the long-term future. Leaders play a role in coordinating and monitoring the organization. The “Market Culture” is oriented toward achieving goals. The organization is geared toward competitiveness and productivity with an emphasis on results. Leaders are focused on achieving results, preferably translated into profits (Cameron and Quinn, 2006).

2.5. Organizational Culture and Performance

To build a successful organizational culture, it is necessary not only to have committed and united leaders at all levels of the organization, but also that the culture must be defined and aligned with the organization's strategy and must be put into practice. Thus, the actions to be taken must be carefully designed and maintained over time (Warrick et al., 2016). The

success of an organizational culture change effort largely depends on whether the organization is able or not to gain the support of all employees (Gover et al., 2015). In order to assess whether the organizational culture perceived by employees is associated with the organization's performance, Zhou et al. (2011) conducted surveys in 87 public hospitals in China. The study carried out by Hann, Bower, Campbell, Marshall and Reeves (2007) analyzed 38 primary care units in England, in which they sought to verify the existence of a relationship between the quality of care and organizational culture. Another study on the relationship between organizational culture and performance, with a sample of ten military health units in Mexico, Revilla-Macías, Santana-Mondragón, and Rentería-López (2015) found evidence of the relationship between the type of organizational culture and performance.

3. Research Methodology

The present research work aimed to identify the predominant organizational culture in the USF-model B units in the Algarve region, based on the perceptions of professionals, with the purpose of understanding the importance of organizational culture in the performance of these units. This research followed a quantitative, cross-sectional approach.

3.1. Sample

With the aim of analyzing the importance of organizational culture in the performance of USF model B units in the Algarve region, the present study used a non-probabilistic and convenience sampling process. Within the non-probabilistic sample, the rational choice sample was chosen, since it involves constituting a sample of individuals based on a characteristic trait (extreme, deviant, typical or distinct cases), represented by the professionals of the USF model B units existing in the Algarve region. The professionals involved in the study were selected because they well represented the phenomenon under study and helped to understand it (Fortin, Côté & Filon, 2009: 322). In order to capture the diversity of perspectives regarding organizational culture, all professionals from the three represented categories were involved in the study. The target population of the study was thus constituted by all the professionals from the eight USF-model B units of the ARS Algarve, corresponding to a total of 145 professionals distributed across the three ACES, the eight USFs and the three professional categories. After the distribution of the questionnaires, which took place in April, May, August and September 2021, 109 valid responses were obtained, which corresponds to an overall response rate of 75%. Table 1 aggregates the absolute and relative data of the responses to the questionnaire considered valid, distributed by USF and ACES.

Table 1 - Distribution of Participants' Responses by ACES/USFB (N/%)

ACES	USF	Frequency (N)	Percentage (%)	Total
Central	Albufeira	11	10,1	67
	Faro - Ria Formosa	13	11,9	
	Loulé – Lauroé	12	11,0	
	Olhão – Âncora	17	15,6	
	Olhão – Mirante	14	12,8	
Sotavento	VRSA - Levante	13	11,9	30
	Tavira – Balsa	17	15,6	
Barlavento	Lagos - Descobrimentos	12	11,0	12
	TOTAL	109	100%	

Source: Own elaboration

3.2. Procedures and Instruments

The Data Sources focused on the questionnaire survey and the Primary Health Care Identity Card database (BI-CSP). The data collected from the questionnaires allowed us to analyze the perception of professionals from the Algarve region's Family Health Units model B (USF-model B) regarding the organizational culture - Clan Culture (A), Adhocracy Culture (B), Hierarchical Culture (C) and Market Culture (D).

The questionnaires were sent via email, with the support of one professional per unit for their dissemination. The distribution of the questionnaires took place in April and May 2021, with a second one being sent three months after the first, in August and September, in order to obtain a higher response rate.

From a search made on the BI-CSP platform, the Overall Performance Indices of the Algarve region's Family Health Units model B were extracted for the months of April, May, August and September 2021 (Table 2), in order to characterize the performance of the units. The selected months correspond to the period of data collection through the questionnaire surveys.

Table 2 - Global Performance Indices for April, May, August and September 2021

USF/ Months	Descobr imentos	Balsa	Levante	Albufeira	Lauroé	Ria Formosa	Âncora	Mirante
Abril	67,00	70,00	74,00	67,00	81,00	71,60	62,30	68,80
May	66,70	71,00	71,30	67,50	80,90	69,20	59,50	71,30
August	64,30	75,30	73,50	69,10	83,20	71,70	60,00	65,40
September	60,00	73,60	71,10	60,00	81,00	69,40	60,40	63,20

Source: Own elaboration

Regarding the format of the questionnaire survey, it was decided to add eight questions, with the purpose of learning about the profile of the professionals from each Family Health Unit (FHU), with respect to gender, age, workplace, qualifications, professional experience, length of practice, and professional category. Thus, the first group of questions refers to the sociodemographic and professional characterization of the professionals, and the second group relates to the Organizational Culture Assessment Instrument (OCAI) developed by Cameron & Quinn (2006), with 48 closed-response questions. This latter group is organized into two parts, with the first seeking to identify the current culture and the second the ideal culture, having been evaluated across six key dimensions: Dominant Characteristics (DC); Organizational Leadership (OL); Management Style (MS); Organizational Climate (OC); Organizational Principles (OP); Criteria for Success (CS). As an alternative to the original Ipsative scale of the OCAI (with weightings that can vary between 0 and 100 points), a Likert-type agreement scale was used, where the response options ranged from 1 (strongly disagree) to 5 (strongly agree). The OCAI showed good psychometric qualities, both in reliability and validity (Cameron & Quinn, 2006), and the Cronbach's Alpha test was applied. It was found that, for the overall responses, the obtained Cronbach's Alpha values were above 0.8, which means the presence of good internal consistency (Hair, Black, Babin, & Anderson, 2014).

For data processing and analysis, descriptive statistical analysis was carried out using the Statistical Package for Social Science (SPSS) V26 software and Excel software for creating tables and graphs. Through descriptive data analysis, the types of current and ideal organizational culture were compared, in order to identify the cultural characteristics represented by the Ministry of Health's Vision for Clinical Primary Care with the performance evaluated by the Clinical Primary Care Identity Card (BI-CSP).

The legal questions inherent to the applicability of the questionnaire were safeguarded by requesting authorization from the ethics committee of the Algarve Regional Health Administration to apply the questionnaire. Ethical issues were also safeguarded by guaranteeing the confidentiality of the respondents' data."

4. Results

4.1. Sociodemographic Characterisation of the Participants

Regarding the sociodemographic characteristics of the participants, it was found that 23 individuals are male and 86 are female, translating to 78.9% female and 21.1% male. In terms of the age group of the professionals, workers aged between 40 and 49 years predominated (45%). As for academic qualifications, the majority of professionals hold a bachelor's degree (57.8%), about 30.3% have completed between the 10th and 12th grades, and 11.9% hold a master's degree. Regarding professional category, it was found that most professionals are nurses with 37.6% (nurses 28.4% and specialist nurses 9.2%), followed by doctors with

32.1% and technical assistants with 30.3%. Concerning the number of years working in the health sector, of the total professionals surveyed (109), 46.8% responded that they have been working for more than 10 years, 44% have more than 6 years of service in the unit, and only 2.8% have been working for less than 5 years.

4.2. Organisational Culture Profile

To describe the organisational culture profile of the eight USFBs that comprise the three ACES of ARS Algarve, an analysis of the participants' perceptions was carried out, considering for this purpose the values based on the relative weighting of the dimensions of each cultural typology. Based on the results obtained from the present study, it was found that the Albufeira unit perceives the six dimensions DC (73%), OL (82%), MS (82%), OC (73%), OP (73%), and CS (73%) as belonging to Type A Culture – Clan Culture. The OL dimension (82%) is shared with Type B – Adhocracy Culture, and the MS dimension (82%) with Type D – Market Culture. When asked about their preferred culture, the unit maintains DC (82%), OL (82%), MS (82%), OC (82%), OP (91%), and CS (82%) as Type A Culture – Clan Culture. The DC dimension (82%) is shared with Type C – Hierarchical Culture.

The **Âncora unit** perceives the dimensions OL (41%), MS (71%), OC (41%), and CS (59%) as being part of Culture Type A – Clan Culture. The dimension DC (59%) is perceived as Type C – Hierarchical Culture, and the dimension OP (71%) as Type D – Market Culture. The OL dimension (41%) is shared with Type D – Market Culture, and the OC dimension (41%) is shared with Type D and B – Market and Adhocratic Cultures. When asked about their preferred culture, the unit maintains the dimensions MS (76%), OC (71%), and OP (76%) as part of Culture Type A – Clan Culture. The DC dimension (82%) remains as Type C – Hierarchical Culture, and the OL (76%) and CS (71%) dimensions as Type D – Market Culture. The OC dimension (76%) is shared between Clan Culture and Type D – Market Culture.

The **Mirante unit** perceives the dimensions DC (64%), OL (57%), and MS (50%) as Type C - Hierarchical Culture. The dimensions OC (64%) and CS (50%) are seen as Type D - Market Culture, and OP (64%) as Type B - Adhocracy Culture. The DC (64%) is equally divided with the same percentage into Type D - Market Culture, MS (50%) with Type A - Clan Culture, and CS (50%) with Type A - Clan Culture. When asked about their preferred culture, the Mirante unit favours DC (79%), OL (71%), and CS (57%) in Type C - Hierarchical Culture; dimensions MS (57%), OC (64%), OP (57%), and CS (57%) in Type A - Clan Culture. The dimensions MS (57%) and OC (64%) are also divided with Type D - Market Culture, and OP (57%) with Type B - Adhocracy Culture.

The **Ria Formosa unit** perceives five dimensions, DC (85%), OL (85%), OC (92%), OP (85%), and CS (85%), as Type A - Clan Culture. The EG dimension (85%) is centred on Type C - Hierarchical Culture. The OP (85%) and CS (85%) dimensions are divided with Type D - Market Culture. When asked about their preferred culture, the Ria Formosa unit favours DC (92%), MS (100%), and OC (77%) in Type A - Clan Culture. The dimensions OL (85%) and OP (85%) are seen as Type B - Adhocracy Culture, and the dimensions OL (85%) and CS (92%) as Type D - Market Culture.

The **Lauroé** unit perceives the dimensions DC (92%), MS (100%), OC (100%), OP (100%), and CS (100%) as Type A - Clan Culture. The dimensions OL (82%) and DC (92%) are perceived as Type B - Adhocracy Culture, and the CS dimension (100%) with the same percentage in Type D - Market Culture. When asked about the ideal culture, the professionals in the Lauroé unit would like to see characteristics of Type A - Clan Culture developed in the dimensions DC (92%), OC (92%), and CS (92%). For the dimensions OL (100%) and OP (83%), they prefer Type B - Adhocracy Culture, and for the dimension MS (100%), they prefer Type D - Market Culture.

The **Descobrimentos unit** perceives all six dimensions DC (92%), OL (92%), MS (100%), OC (100%), OP (83%), and CS (100%) as Type A - Clan Culture. When asked about their preferred culture, the unit maintains DC (83%), MS (100%), OC (92%), OP (92%), and CS (100%) in Type A - Clan Culture, and the OL dimension (92%) in Type D - Market Culture.

The **Balsa unit** perceives all six dimensions DC (94%), OL (82%), MS (88%), OC (88%), OP (94%), and CS (100%) as Type A - Clan Culture. The OL dimension (82%) is also aligned with Type B - Adhocracy Culture. When asked about their preferred culture, the unit maintains the dimensions DC (71%), MS (82%), OC (88%), OP (82%), and CS (82%) in Type A - Clan Culture, and the OL dimension (100%) in Type B - Adhocracy Culture.

The **Levante unit** perceives the dimensions OL (62%), OC (85%), and CS (85%) as Type A - Clan Culture, the dimensions DC (92%), OL (62%), and OP (85%) as Type B - Adhocracy Culture, and MS (77%) as Type D - Market Culture. When asked about their ideal culture, the unit prefers the dimensions DC (85%), MS (85%), OC (85%), OP (92%), and CS (100%) as Type A - Clan Culture. The MS (85%) is also aligned with Type D - Market Culture, and the OL (77%) with Type B - Adhocracy Culture.

5. Discussion

From the analysis of the IDG in the USFs of model B, it was possible to verify that there were no significant fluctuations across different months. In April, May, and August 2021, the USFB that achieved the highest IDG was Lauroé (81%, 80.9%, and 83.2% respectively), while the one with the lowest IDG was Âncora (62.3%, 59.5%, and 60% respectively). In September 2021, the USFB that reached the highest IDG was again Lauroé (81%), and the one with the lowest IDG was Descobrimentos (60%) and Âncora with 60.4%. All USFs have Clan Culture as the dominant organisational culture type. The study results showed that the cultural profile of the highest-performing USFs, namely Lauroé, Levante, and Balsa, is Clan Culture in all dimensions, while also displaying characteristics of Adhocratic and Market cultures, particularly in the dimensions of Dominant Characteristics, Organisational Leader, Management Style, Organisational Principle, and Success Criteria. These results suggest that USFs with lower IDG should enhance Adhocratic and Market cultures, especially in terms of Leadership and Success Criteria, to achieve better IDG scores. The USFs with the lowest IDG are Descobrimentos and Âncora. In these USFs, the predominant organisational culture profile is also Clan Culture. Comparing these with the units with higher IDG, differences in Organisational Leadership are noted, as leaders in Descobrimentos and Âncora are not perceived as entrepreneurial, innovative, or challenge-accepting. Professionals in USFs with better IDG wish to perpetuate Clan Culture while increasing Adhocratic and Market Cultures, particularly focusing on Organisational Leadership. This cultural profile could also be leveraged as a competitive advantage to improve their performance indicators. Leone and Lapão (2014) mention that a leader with Adhocratic typology possesses better characteristics to adapt and take risks in the face of change in an organisation where Clan Culture dominates. To validate the current and desired culture, strategic actions are needed to identify necessary changes and develop an action plan to improve performance indicators. In this context, and based on the results, some recommendations for this change are presented in Table 3.

Table 3 - Recommendations for Cultural Change Management Actions

Encourage employee participation in all aspects of organisational life (Cameron & Quinn, 2006).
Promote teamwork and partnerships while maintaining rigorous performance management styles (Loyd, 2001). Healthcare professionals should develop teamwork skills to create a sense of belonging to a specific group (Leone et al., 2014).
Foster management styles that reflect the Clan culture type, with approaches aimed at enhancing a supportive culture (Ferreira, 2011).
Adapt the management style to the culture of each organisational unit using appropriate tools to address organisational challenges and adapt to the context, resizing resources, redefining strategy, philosophy, and policy from an evolution, adaptation, and survival perspective (Mintzberg, 2004).
Encourage a spirit of mutual assistance, group cohesion, and a healthy and pleasant environment (Cameron & Quinn, 2006). Culture can thus represent a competitive advantage in organisations, especially when there is a set of common and consensual perceptions that integrate memories, values, attitudes, and definitions (Ferreira, 2011).
Promote the affirmation of values, mission, and vision to effectively guide the work (Monteiro & Valente, 2007).
Improve socialisation through relationships among team members and by organising activities (Schein, 2010).
Promote shared values, beliefs, and principles, as well as a strategic vision (Monteiro & Valente, 2006, 2007).
Develop a culture where empathy and close relationships between healthcare professionals and patients are important (Gregory et al., 2009).
Encourage the effective sharing of values within units, as only when cultural values are genuinely shared can strategic alignment be achieved, particularly in organisations characterised by teamwork and greater autonomy for professionals (Robbins, 2009).

Source: Own elaboration

6. Conclusion

The execution of this study allowed, in the first phase, to characterise the sociodemographic profiles of professionals in the USFB, finding that technical assistants, nurses, and doctors have a great similarity concerning the predominant culture. The three professional groups recognise Clan Culture as currently predominant in their units. This culture is characterised by teamwork, a healthy environment, human resource development, and concern with evolution and change. However, ideally, they acknowledge that the organisation should adopt a more competitive posture oriented towards production and performance. Clan Culture is typical of organisations that are very familiar places to work, where people share much of themselves, which could explain the predominance of this type of culture in the USFB. The fact that Market Culture was the second-highest cultural profile could be due to the philosophy of professionals being oriented towards high performance and productivity underlying the creation of these units (Cruz and Ferreira, 2012). Hierarchical Culture had the lowest average, as the USFB represent a new organisational model that opposes the traditional hierarchy and bureaucracy of vertical power and decision-making. The study results showed that the highest-performing USFs were Lauroé, Levante, and Balsa, which have Clan Culture characteristics in all dimensions, although they also exhibit features of other cultural types, particularly Adhocratic and Market cultures. These results indicate that no organisation reflects a single cultural type but rather a combination of them (Santos, 2000). The USFs with the lowest IDG are Descobrimentos and Âncora. In these USFs, Clan Culture is also predominant, but the organisational leader is not perceived as entrepreneurial, innovative, or challenge-accepting. A leader with Adhocratic characteristics is better suited to adapt and face risks in a changing organisation dominated by Clan Culture (Leone and Lapão, 2014), traits observed in the USFs with the highest IDG.

6.1. Limitations

Among the main limitations of this study is the fact that it was conducted during the Covid-19 pandemic, which resulted in an overload for healthcare professionals on care teams, making data collection more difficult. Another limitation was the use of the OCAI questionnaire on a Likert scale, where responses are given on a scale based on the degree of agreement, disagreement, and neutrality regarding different statements. This led to many neutral responses. The choice of an Ipsative scale would have been more appropriate, as respondents would have to allocate 100 points among the alternatives, giving more points to those most similar to their organisation.

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TOURISM AND THE CHAOTIC ECONOMIC GROWTH MODEL: THE ASEAN COUNTRIES

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Abstract
The main aim of this paper is to analyze the tourism total contribution to GDP growth stability in Brunel Darussalam, Indonesia, Malaysia, Vietnam, Thailand, and Philippines in the period 2010-2019. Four members of ASEAN were excluded due to a lack of data. This paper applies the chaos theory and creates the model. Also, this paper confirms the existence of the growth stability of the tourism total contribution to GDP in the observed countries in the observed period.

Keywords: Tourism Total Contribution to GDP, ASEAN, Growth, Stability, Chaos,
JEL classification: Z3, C2, O4, E22,

1. Introduction

The Association of Southeast Asian Nations, or ASEAN, was established on 8 August 1967 in Bangkok, Thailand (Bangkok Declaration). The five Founding Members of ASEAN are Indonesia, Malaysia, Philippines, Singapore and Thailand, or ASEAN-5. Further, ASEAN-10 refers to Brunei Darussalam, Cambodia, Indonesia, Lao P.D.R., Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.

Table 1. ASEAN-10

	Joined ASEAN	Capital	Language(s)	Currency
Brunei Darussalam	on 7 January 1984	Bandar Seri Begawan	Malay, English	B$ (Brunei Dollar)
Cambodia	on 30 April 1999	Phnom Penh	Khmer	Riel
Indonesia	on 8 August 1967	Jakarta	Indonesian	Rupiah
Lao PDR	on 23 July 1997	Vientiane	Lao	Kip
Malaysia	on 8 August 1967	Kuala Lumpur	Malay, English, Chinese, Tamil	Ringgit
Myanmar	on 23 July 1997	Nay Pyi Taw	Myanmar	Kyat
Philippines	on 8 August 1967	Manila	Filipino, English, Spanish	Peso
Singapore	on 8 August 1967	Singapore	English, Malay, Mandarin, Tamil	S$ (Singapore Dollar)
Thailand	on 8 August 1967	Bangkok	Thai	Baht
Vietnam	on 28 July 1995	Ha Noi	Vietnamese	Dong

Source: https://asean.org/

Table 2. ASEAN-10, economic indicators

	GDP, constant prices % change	GDP per capita, constant prices Purchasing power parity; 2017 international $	Total investment % of GDP	Inflation, average consumer prices Index	Unemployment rate % of total labor force	Population Persons Millions	Current account balance % of GDP	General government net debt % of GDO
Brunei Darussalam	-1.628	59,772.82	25.851	106.48	5.2	0.441	19.567	2.531
Cambodia	5.239	4,753.45	24.5	197.995	-	15.993	-27.285	-0.88
Indonesia	5.309	12,438.76	29.745	111.031	5.86	274.859	0.961	-2.341
Lao PDR	2.252	7,797.81	-	144.443	-	7.477	-5.957	-1.632

	GDP, constant prices % change	GDP per capita, constant prices Purchasing power parity; 2017 international $	Total investment % of GDP	Inflation, average consumer prices Index	Unemployment rate % of total labor force	Population Persons Millions	Current account balance % of GDP	General government net debt % of GDO
Malaysia	8.65	29,501.73	23.506	127.233	3.825	32.652	-5.879	3.076
Myanmar	1.971	4,104.77	32.285	194.102	-	53.886	-5.14	-4.298
Philippines	7.57	8,888.77	24.698	115.283	5.4	111.57	-5.477	-4.481
Singapore	3.647	92,607.92	21.922	108.37	2.1	5.637	19.332	0.842
Thailand	2.643	17,915.86	27.807	106.472	1.3	70.078	-2.968	-4.555
Vietnam	8.02	11,250.46	33.407	296.455	2.32	99.462	-0.264	0.257

Source: www.imf.org

Dolezal C., Trupp A., and H. T. Bui (Ed) (2020) analyze the role tourism plays for sustainable development in Southeast Asia. They offer new understandings of tourism dynamics and shows an overview of tourism's role in economic development.

Harrison D., et al., (Ed.) (2018) analyze the literature on tourism in East and South-east Asia and explain the historical development of tourism, and the economic, political, social, cultural and environmental issues.

Ward T., et al., (2020) confirm that COVID-19 (coronavirus) is affecting nearly 47.7 million travel and tourism jobs across South Asia. Their regional expected losses are over 50 billion US dollars in gross domestic product. According to the World Bank's regional portfolio, governments intervention is important. This region covers Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.

According Baek et al., (2023), the ASEAN-5 region (Indonesia, Malaysia, the Philippines, Singapore, and Thailand) has benefited through trade. It is important to advance financial integration. This regional financial integration and digitalization could generate output benefits for the region.

According IMF (2022), growth in Asia and Pacific is expected to moderate to 4.0 percent in 2022 and rise to 4.3 percent in 2023.

According OECD (2023b), economic growth in 2023 is projected to 5.3 % on average in Emerging Asian economies (ASEAN-10, China and India). Before the COVID-19 pandemic, travel and tourism generated approximately 12% of GDP in Southeast Asian economies. According OECD (2023a), tourism will be key factor of economic growth in ASEAN economies. Tourism is composed mostly of micro, small and medium-sized enterprises. Digitalization in tourism is important process.

According to Makun and Jayaraman (2022), for the South Asian countries, the crisis has negative effect on economic growth in 2020 and 2021. Their study uses a nonlinear econometric methodology. They state the existence of an asymmetric association between tourism and economic growth for six South Asian countries for the period 1995 to 2018.

Maneejuk P., et al., (2022) examine the nonlinear impact of tourism development on economic growth in Southeast Asian countries. They also find a positive influence of gross capital formation, real effective exchange rate, international tourism expenditure, and tourism receipts on Southeast Asian economic growth.

According, ASEAN Tourism Strategic Plan 2016-2025 (2015), it is anticipated that by 2025: (a) The GDP contribution of ASEAN tourism could increase from 12% to 15%; (b) Tourism's share of total employment could increase from 3.7% to 7%; (c) Per capita spending by international tourists could increase from US$ 877 to US$ 1,500; (d) Increase the average length of stay of international tourist arrivals from 6.3 nights to 8 nights; (e) The number of accommodation units could increase from 0.51 units per 100 head of population in ASEAN to 0.60 units per 100 head of population; (f) The number of awardees for the ASEAN tourism standards could increase from 86 to 300; (g) The number of community-based tourism value chain project interventions could increase from 43 to over 300.

Sirisuthikul (2018) suggests the branding of ASEAN tourism. National Tourism Organizations (NTOs), Destination Marketing Organization (DMO) and other stakeholders of ASEAN tourism should create a consistent positioning of the destination.

According Yin, et al., (2020), explain the structure of tourism cooperation in China-ASEAN relations. Namely, differences in the political system, security, population density, and language have positive effects on tourism cooperation, while differences in governance, income, and consumption level have negative effects on tourism cooperation.

Beh L-S., & Leong L.W. (2021) examine the possible causality that exists between COVID-19 and tourist arrivals in ASEAN countries. Their results revealed that international tourism can seriously be affected by the COVID-19 crisis.

Zhang H., et al., (2023) confirm that the tourism sustainable development index has a positive and linear relationship with the green economic growth index in ASEAN (The Association of Southeast Asian Nations) countries throughout 2000–2021.

According Rahayu, R. K., et al., (2017), each country in ASEAN has their own tourism slogan: a) Brunei (Brunei, The Green Heart of Borneo, The Kingdom of Unexpected Treasures), b) Cambodia (Kingdom of Wonder), c) Indonesia (Wonderful Indonesia), d) Laos (Simply Beautiful), e) Malaysia (Malaysia Truly Asia), f) Myanmar (Mystical Myanmar), g) Philippines (It's More Fun in the Philippines), h) Singapore (Your Singapore), i) Thailand (Amazing Thailand, Always Amazes You), j) Vietnam (The Timeless Charm).

According to Kotler (2008) brand is a name, term, sign, symbol or design or a combination of them, intended to identify the goods or services of one seller of a group the of seller and to differentiate them from those of competitors. This paper is trying to explain how city branding has been developing in almost all ASEAN country.

According Rahmiatia et al., (2021), the COVID-19 pandemic has had the greatest effect on the travel and tourism industry. This study examined the performance of tourism contribution to Gross Domestic Product (GDP) in ASEAN countries (Indonesia, Singapore, Malaysia, Myanmar, The Philippines, Vietnam, Lao PDR, Myanmar) in the period 2009-2018. The result shows that tourism receipts and tourist expenditure have a significant positive effect, whereas tourist arrivals have a significant negative effect, and the exchange rate has no significant effect on GDP.

According OECD (2023a), Indonesia's real GDP grew by 5.3% in 2022. In Malaysia, real GDP grew by 8.7% in 2022. The Philippines' real GDP grew by 7.6% in 2022. In Thailand, real GDP grew by 2.6% in 2022. In Vietnam, real GDP grew by 8.0% in 2022. Brunei Darussalam's economy rebounded with 0.9% growth in Q3 2022. In Singapore, real GDP growth will moderate to 2.2% in 2023. In Cambodia, real GDP grew by an estimated 5.1% in 2022. Lao PDR's GDP growth is expected to be at 3.5% in 2023. In Myanmar, economic growth is expected to be 2.0% in 2023.

According OECD (2023a): a) Indonesia should maximize the potential of its 17 000 islands; b) Tourism share of GDP has declined over the past decade in Lao PDR; c) Malaysia prefers to become the world leader in Islamic tourism; d) In Myanmar, tourism planning is an important activity; e) The Philippines has a rich cultural heritage and natural landscapes; f) In Singapore's tourism should be an important economic factor. Also, tourism should create employment opportunities. Singapore is also a world destination for meetings, incentives, conferences and exhibitions (MICE) tourism; g) Much tourism in Thailand is international; h) Vietnam is known for its beautiful scenery, including long coastlines and deep forests, …

Scarlett (2021) examines the economic influence of tourism on economic growth in a panel of 46 countries. Tourism has a statistically significant positive effect on economic growth. Increase in the tourism receipts relative to GDP is expected to positively impact the net FDI inflows to GDP ratio.

Chaos theory is applied in this paper. This paper creates the chaotic economic model. Namely, this paper develops the chaotic, nonlinear growth model (Jablanovic, 2022/23).

2. The model

The chaotic growth model is presented by the following equations (Jablanovic, 2022/23):

$$S_t = \left(\frac{Y_1}{Y}\right)_t \quad (1)$$

$$I_{1,t} = \gamma Y_{1,t} \qquad 0<\gamma<1 \quad (2)$$

Now, it is important to introduce the share of non-tourism sector in the GDP, $\left[1-\left(\frac{Y_1}{Y}\right)_t\right]$, in the model (Jablanovic, 2022/23), i.e.,

$$\frac{S_{t+1}-S_t}{S_t} = \alpha + \beta\left(\frac{I_1}{Y}\right)_t + \delta\left[1-\left(\frac{Y_1}{Y}\right)_t\right] = \alpha + \beta\left(\frac{\gamma Y_1}{Y}\right)_t + \delta\left[1-\left(\frac{Y_1}{Y}\right)_t\right] \quad \alpha, \beta.\delta > 0 \quad (3)$$

Or

$$S_{t+1} = (1+\alpha+\delta) S_t + (\beta\gamma-\delta) S_t^2 \qquad \alpha, \beta, \delta > 0 \quad (4)$$

with Y – the gross domestic product (GDP) , Y_1 – tourism GDP, S - the percentage of tourism in GDP, I – investment in tourism , γ – investment in tourism rate, α, β, δ – the coefficients of the tourims total contribution to GDP growth function.

We introduce s as $s = S / S^m$, where S is the percentage of tourism in GDP and S^m is the maximal size of the percentage of tourism in GDP in time series. Thus s range between 0 and 1. Now the tourism total contribution to GDP growth rate is measured as

$$s_{t+1} = (1+\alpha+\delta) s_t + (\beta\gamma-\delta) s_t^2 \qquad \alpha, \beta, \delta > 0 \quad (5)$$

For most choices of α, β, γ and δ, there is no explicit solution for the logistic model (5). Lorenz (1963) discovered this effect - the lack of predictability in deterministic systems. Sensitive dependence on initial conditions is one of the central parts of what is called deterministic chaos.

3. The logistic equation

Iteration process for the logistic equation

$$z_{t+1} = \pi z_t (1 - z_t) , \quad \pi \in [0,4] , \quad z_t \in [0,1] \quad (6)$$

is equivalent to the iteration of growth model (8) when we use the identification

$$z_t = -\left[\frac{\beta\gamma-\delta}{(1+\alpha+\delta)}\right] s_t \quad \text{and} \quad \pi = (1+\alpha+\delta) \quad (7)$$

Using (5) and (7) we obtain:

$$z_{t+1} = -\left[\frac{\beta\gamma-\delta}{(1+\alpha+\delta)}\right] s_{t+1} = -\left[\frac{\beta\gamma-\delta}{(1+\alpha+\delta)}\right]\left[(1+\alpha+\delta)s_t + (\beta\gamma-\delta)s_t^2\right] = -(\beta\gamma-\delta)s_t - \left[\frac{(\beta\gamma-\delta)^2}{(1+\alpha+\delta)}\right] s_t^2$$

On the other hand, using (6) and (7) we obtain:

$$z_{t+1} = \pi z_t (1 - z_t) =$$

$$= -(1+\alpha+\delta)\left[\frac{(\beta\gamma-\delta)}{(1+\alpha+\delta)}\right]s_t\left\{1+\left[\frac{(\beta\gamma-\delta)}{(1+\alpha+\delta)}\right]s_t\right\} = -(\beta\gamma-\delta)s_t - \left[\frac{(\beta\gamma-\delta)^2}{(1+\alpha+\delta)}\right]s_t^2$$

Thus we have that iterating (5) is really the same as iterating (6) using (7). It is important because the dynamic properties of the logistic equation (6) have been widely analyzed by Li & Yorke (1975), and May (1976).

It is obtained that :(i) For parameter values $0 < \pi < 1$ all solutions will converge to $z = 0$; (ii) For $1 < \pi < 3{,}57$ there exist fixed points the number of which depends on π;(iii) For $1 < \pi < 2$ all solutions monotonically increase to $z = (\pi - 1) / \pi$; (iv) For $2 < \pi < 3$ fluctuations will converge to $z = (\pi - 1) / \pi$; (v) For $3 < \pi < 4$ all solutions will continously fluctuate; (vi) For $3{,}57 < \pi < 4$ the solution become "chaotic".

4. Empirical evidence

The main aim of this paper is to analyze the tourism total contribution to GDP growth stability in Brunel Darussalam , Indonesia, Malaysia , Viet Nam, Thailand, and Philippines https://www.unwto.org/tourism-statistics/economic-contribution-SDG. Four countries of ASEAN were excluded due to a lack of data.

In this sense, it is important to use the logistic model (8):

$$s_{t+1} = \pi s_t + \upsilon s_t^2 \qquad (8)$$

where s– the percentage of tourism in GDP , π - $(1+\alpha+\delta)$ υ - $(\beta\gamma-\delta)$, where γ – investment in tourism rate, α, β, δ – the coefficients of the tourism total contribution to GDP growth function.

Now, the model (8) is estimated (see Tables 1-6.).

Table 1. The estimated model (8): Brunel Darussalam, 2010-2016. (R=0.33230)

	π	υ
Estimate	1.675798	-0.79256
Std.Err.	0.495100	0.57518
t(4)	3.384765	-1.37793
p-level	0.027663	0.24029

Source: Author's calculations

The estimated value of π shows that tourism direct GDP as a proportion of total GDP (%), monotonically increased in Brunel Darussalam in the period 2010-2016.

Table 2. The estimated model (8): Indonesia , 2009-2019. (R=0.93813)

	π	υ
Estimate	0.947833	0.081469
Std.Err.	0.138716	0.158366
t(8)	6.832919	0.514437
p-level	0.000133	0.620853

Source: Author's calculations

The estimated value of π show s that tourism direct GDP as a proportion of total GDP (%), monotonically increased in Indonesia in the period 2009-2019.

Table 3. The estimated model (8): Malaysia, 2010-2019. (R=0.93023)

	π	υ
Estimate	1.128385	-0.117694
Std.Err.	0.142822	0.156636
t(7)	7.900616	-0.751390
p-level	0.000099	0.476914

Source: Author's calculations

The estimated value of π shows that tourism direct GDP as a proportion of total GDP (%), monotonically increased in Malaysia in the period 2010-2019.

Table 4. The estimated model (8): Vietnam, 2013-2019. (R=0.97289)

	π	υ
Estimate	0.963037	0.145876
Std.Err.	0.142921	0.181167
t(4)	6.738236	0.805204
p-level	0.002528	0.465840

Source: Author's calculations

The estimated value of π shows that tourism direct GDP as a proportion of total GDP (%), monotonically increased in Viet Nam in the period 2013-2019.

Table 5. The estimated model (8): Thailand, 2010-2017. (R=0.95019)

	π	υ
Estimate	1.22687	-0.166400
Std.Err.	0.158541	0.207422
t(5)	7.738518	-0.802227
p-level	0.000576	0.458837

Source: Author's calculations

The estimated value of π shows that tourism direct GDP as a proportion of total GDP (%), monotonically increased in Thailand in the period 2010-2017.

Table 6. The estimated model (8): Philippines, 2010-2019. (R=0.99067)

	π	υ
Estimate	1.17151	-0.12201
Std.Err.	0.05880	0.07450
t(7)	19.92363	-1.63770
p-level	0.00000	0.14550

Source: Author's calculations

The estimated value of π shows that tourism direct GDP as a proportion of total GDP (%), monotonically increased in Phillipines in the period 2010-2019.

5. Conclusion

This paper creates the tourism total contribution to GDP chaotic growth model. For most choices of α, β, γ, and δ there is no explicit solution for the chaotic growth model (5).

A key hypothesis of this work is based on the idea that the coefficient π - (1+α+δ), where α, β, and δ are the coefficients of the tourism total contribution to GDP growth function play a crucial role in explaining the local growth stability of the tourism total contribution to GDP .

An estimated values of the coefficient π confirm stable growth of the tourism total contribution to GDP in Brunel Darussalam , Indonesia, Malaysia , Viet Nam, Thailand, and Philippines in the observed periods, respectively.

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THE IMPLEMENTATION OF SOCIAL PROTECTION POLICIES AT LOCAL LEVEL ACCORDING TO INCLUSIVE AND SUSTAINABLE DEVELOPMENT

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Abstract
The term inclusive and sustainable development first appeared in the 21st century and has been accepted in academic texts and political institutions. Some scientific and institutional bodies argue that sustainable development policies at regional and local level should identify new approaches to social protection policies at local level in the context of inclusive and sustainable development. The extensive literature review of the study found that regional and local communities clearly have an important role to play in developing new policies and applied operational strategies of social protection at local level according to inclusive and sustainable development . This study also presents policies, defines the concept, proposes qualitative metrics, analyzes international and European social protection policies at local level in the context of inclusive and sustainable development. It concludes that regions, cities, local social stakeholders, must harmonise the basic principles of social protection policies and take an active role in fulfilling the regional/local objectives of Inclusive and Sustainable Development.

Keywords: Social Protection, Inclusive Development, Inclusive Growth, Sustainable Development, Sustainable Regions, Sustainable Cities.
JEL classification: R10, Q01, Q50, G10, G30, H10, H30, H70

Import

At the institutional level for social protection, every decade experiments with ideas and concepts about sustainable and inclusive development and their promotion in global conditions. Relevant references to social protection in the context of inclusive development in the relevant global treaties are: a) the World Convention on Human Rights of the 1940s, b) the conditions for development and investment in countries lagging behind in development in the 1950s, c) human rights treaties to protect both politicians, economic as well as social rights in the 1960s, d) the relevant conditions of social equity with references to how unemployment, inequality and persistent poverty require a strong focus on development, income redistribution, rural focus and human development indicators in the 1970s, e) the conditions for external environmental impacts and the need for an organised response in the 1970s; as well as the integration of the environment as a key pillar of development through sustainable development in the 1980s (World Commission on Environment and Development – WCED, 1987); g) conditions that redefine the boundaries of development through social inclusion, social dialogue for development and the need to study social movements, including anti-poverty and social cohesion movements; focusing on human rights, the potential for reducing social inequalities with parallel processes focusing on environmental conservation, third world development, social survival and women's empowerment reflected in the United Nations Agenda 21 (UNSD, 1992); h) the 2000 Millennium Development Goals (MDG) to advance global policies; in order to take initiatives to solve social injustices, i) In the context of the global treaty on sustainable development, the scientific community promotes the Agenda for inclusive development and climate change and contributed to the adoption of the UN Sustainable Development Goals in 2015.

Today, the United Nations Strategy (UNDP) “For Sustainable and Inclusive Growth” presents the organization's service offering to support the participating countries as they formulate and implement national and regional social protection plans to achieve inclusive sustainable growth and full and productive employment. Three broad priorities have been

identified as critical to enable countries to succeed this objective: (a) Integrated planning for inclusive sustainable growth, (b) Support job creation, decent work and redistributive programmes to tackle poverty, inequality and exclusion, (c) Mobilise and scale up funding for the transition to inclusive sustainable growth. The OECD in its report "Development Cooperation 2018: Joining forces to leave no one behind"[1] tries to answer questions of inclusive and sustainable development and argues that in order to deliver on the collective promise to achieve the Sustainable Development Goals (S.D.Gs.) for all, no one behind should be left behind and help those furthest behind first. The Existing developmental cooperation is not sufficient (OECD, 2018), as the development aid providers need to make new, conscious, systematic and coordinated efforts to adapt the social protection narrative, management practices and funding to maximise individual and collective impact. This report calls on development aid providers to update development cooperation frameworks in three ways: a) A new narrative that clearly states the mutual benefits for all of leaving no one behind; b) Consciously mainstreaming the goal of inclusive growth, equitable and sustainable development through development cooperation portfolios and through the harnessing of agents of change; Smarter use and distribution of Official Development Assistance as an integral part of wider efforts to increase the volume of funding in order to achieve the Sustainable Development Goals (S.D.Gs.) for all.

These findings, and other relevant operational investigations and institutional processes, have led to the emergence of a global consensus on the need for a more consensual and sustainable model of social protection and sustainable and inclusive development that promotes high living standards for all "leaving no one behind now and in the future" and incorporated these common global requirements into the seventeen (17) Sustainable Development Goals. Also, the roots of the delimitation of social protection within the concept of "sustainable and inclusive growth" have advanced inter-sectoral and inter-disciplinary and have expanded at institutional, legislative, regulatory and operational level and are constantly evolving in the context of sustainable development. These global treaties also complemented the initiatives of the global financial institutions on "Sustainable Finance" of the United Nations (UNEP FI),[2] the Inclusive Green Growth, The Pathway to Sustainable Development of the World Bank (World Bank, 2017) [3], EU Sustainable Finance[4], Sustainable Taxonomy, the Green Deal and the Just Transition of the European Union (EU 2015-2021) which in turn promote social protection and inclusive sustainable development within economic, social and environmental boundaries.

A similar concern is established in the political and scientific agenda for the promotion of social protection policies in the context of sustainable and inclusive development at regional and urban level. Despite widespread concern about social inequality, local policymakers often have limited powers to directly address the problem and improve policies for inclusive growth (Glaeser *et al.,* 2009; Lee *et al.,* 2016). It should be stressed that while regions and cities clearly have an important role to play in social protection policies to develop new ideas and applied operational strategies for inclusive local development, this role is inevitably limited compared to the role of policies at national government level. Some scientific and institutional actors also argue that urban development social policies at local level will identify new approaches to inclusive and sustainable development. For example, in his proposal Angel Guerria of the OECD at the launch of the OECD project on inclusive growth in cities, states "If we want to succeed, then we need to ensure that cities are at the heart of the struggle. After all, while cities are on the receiving end of the devastating effects of inequalities, which are

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[4] For more information https://finance.ec.europa.eu/sustainable-finance_en

becoming more pronounced, they must also be the cities that can bring the most innovative and effective solutions to the problem" (OECD, 2016).[5]

All these mentioned so far highlight a series of questions and initiatives that need to be defined for social protection policies at local level in the context of inclusive and sustainable development: a) The concept of inclusive and sustainable development and the measurement of well-being of OECD regional policies[6], with particular commitment to the UN Sustainable Development Goals and Inclusive Local[7] Communities (OECD, 2020; OHE, 2018). b) To increase productivity by participating in employment and sharing the benefits of development with social and environmental justice among all World Bank citizens and developing local capacities and financing by the International Monetary Fund (World Bank 2017, 2021; IMF, 2017, 2019)[8]. c) The policy of the European Union with the 2020 Strategy[9] and the Sustainable Development 2030[10], based on the belief that it is possible to find a common Agenda, recognizing the need for some levels of local development, but where the benefits of this economic development will be distributed more socially, fairly and environmentally sustainable to the local community. The road to this reconciliation of social protection policies at local level according to inclusive and sustainable development lies in exploring the relationship at the local level between economic development, human social well-being and environmental balance. Furthermore, inclusive and sustainable development must place further emphasis on the local social and environmental aspects of sustainable development that must meet the needs of present and future generations, the intergenerational component, and address the economic, environmental and social aspects of development at local level with an additional key component, the commitment of "leaving no one behind now and in the future".

This article provides a literature review to define social protection at local level in the context of inclusive and sustainable development, defines the concept and describes indicators for measuring inclusive and sustainable development, presents relevant European policies and offers some concerns and summarises of doctrinal proposals with concrete conclusions to propose a holistic social protection dynamic in the context of Inclusive and Sustainable Development.

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[9]For more information, https://eur-lex.europa.eu/legal-content/EL/TXT/?uri=LEGISSUM%3Aem0028 (Assessed 12 October 2024)

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1. The literature review on the delineation of inclusive local development policy in the context of sustainable development.

In the context of academic literature and institutional texts, a historical review of the term inclusive growth is based on the economic theory of "Economic Growth11", which refers to the annual percentage change of a variable (in this case income or output), and has been developed by academia since the 1950s. Frustration caused by the failure of these theories has led academia and power institutions to focus on qualitative indicators related to the possibilities of satisfying individual and social needs. Such as for example, per capita income and job creation strategies and the revitalisation of sectors that had declined (e.g. rural areas and local and peri-urban areas) in the 1970s. With the debt crisis of developed countries in the 1970s and the imposition of structural restructuring economic Global, European and National programs of social protection and fiscal discipline programs in the 1980s, health, education, employment and poverty reduction programmes were subsidised that often had to be restructured to reduce the worsening of poverty and exclusion of vulnerable groups. During the 1990s the focus shifted to human development, poverty reduction and increased social rights under the term "inclusive growth". This term focuses on increasing per capita income through economic growth and greater access to non-income segments of social welfare, improved by active policy makers, the state and contributions from other social actors, and is defined as growth that not only creates new economic opportunities, but that which ensures equal access to the opportunities created for all social protection, especially for the poor (Chatterjee, 2005). In this context, the literature delineates: a) high and sustainable growth to create productive and decent work opportunities and b) social inclusion to ensure equal access to opportunities for all (Ali and Son 2007). At the same time, the term "Inclusive Development", which was first mentioned in the academic literature in 1998, but became an important part of the scientific literature after 2008. In this version, inclusive Growth argues that unbalanced growth can lead to exclusion of some people, concentration of wealth and fragmentation of labour markets. Instead of focusing on economic growth, this theory calls for direct democracy (in the exercise of social policies, social and political rights) and the balanced distribution of social welfare (e.g. health, education, employment, social structures) (Sachs 2004). Musahara defines inclusive growth as "improving the distribution of social well-being in dimensions beyond growth" (Musahara, 2016). Similarly, according to Johnson and Anderson (2012), Inclusive Development "is a process of structural change that gives voice and strength to the concerns and expectations of different social groups that are excluded. It redistributes incomes generated in both the formal and informal sectors in favor of these social groups and allows them to shape the future of society in interaction with other stakeholder groups" (Johnson and Anderson 2012). Hickey et al report that inclusive development "is a process that occurs when social and material benefits are shared equally by equitable distributions within societies, income groups, genders, nationalities, regions, religious groups, etc." (Hickey et al., 2015). Gupta et al add to the concept of inclusive development the environmental dimension "development that involves marginalized people, sectors and countries in social, political and economic processes for increased human well-being, social and environmental sustainability and empowerment" (Gupta et al., 2015).

Emerging theory and evidence suggest a strong role for macroeconomic policies in shaping social protection policies in the context of inclusive growth, both in the short and long term. The two-way relationship between macroeconomic policies and social inequality highlights the challenge of identifying and assessing causal relationships in inclusive growth. New emerging models for inclusive growth with heterogeneous factors have much to

11 Economic growth is defined as the percentage annual change in the output of an economy. The term economic growth is often used over economic growth and vice versa. More generally, growth is defined as the annual percentage change of a variable (in this case income or output) and is therefore a quantitative indicator. The term economic growth is a (mainly) qualitative indicator, which is related to the possibilities of satisfying individual and social needs.
The content of the two terms is, above all, complementary, since economic development presupposes economic growth. However, the implementation of some growth policies may limit the potential for economic development

offer in this area (Davoodi et al., 2021). According to Pouw and McGregor, as well as Gupta and colleagues, a cross-sectoral separation according to the conceptual and organic dimensions of the term inclusive growth may be broken down by a fourfold thematic agenda. First, inclusive growth is being used to counter the dominant neoliberal capitalist agenda. Second, is based on concepts such as inclusive growth, inclusive economy, prosperity, social justice and human rights. Third, inclusive growth that analyses the correlation based on social inequalities and poverty. Fourth, it concerns inclusive growth in the context of the anthropocentric (sociological) and eco-systemic (environmental) approach, (Pouw and McGregor, 2014; Gupta et al., 2015). In addition, the interdisciplinary separation of the literature review is determined for the following reasons: First, for institutional, legislative and regulatory considerations relating to the fight against poverty and social inequality. Secondly, the institutional, legislative and regulatory provisions and legal conditions deriving from human rights. Thirdly, adherence to the arguments for economic and social protection and safeguards that enable socially excluded and poor people to have access to legal means of survival and to live in safety and dignity. Fourthly, the economic reasons for development and the safeguarding of economic production by future generations and for the balanced management of natural resources. Fifth, the operational planning of economic systems and socio-political organizational systems that define poverty as a result of the strongest economies. Sixth, the allocation of natural resources (environmental balance-Environmental), social welfare (distributive justice-Social) and democratic decision-making processes (ESG) for the participation of all in political and operational decision-making (procedural justice-corporate governance) (Sachs, 2004; Stiglitz et al., 2009; Pouw and McGregor, 2014; Gupta et al., 2015).

Exploiting synergies between social policy areas at local level is also essential. Ianchovichina and Lundström (2009) in their study for the World Bank (Word Bank) stress that inclusive and sustainable growth at local level is "productive employment achieved through employment growth (new jobs, wages and self-employment) and productivity growth, which in turn has the potential to expand wages of wage earners and wage earners. incomes of the self-employed'. Another example is innovation that requires investment in human resources and appropriate competition policies to encourage entrepreneurship. Innovation is a key pillar of green growth, involving the *greening* of old activities by exploiting knowledge and new technologies that can also create new jobs and promote social well-being in an environmentally sustainable way (De Mello and Dutz, 2012). A related study on the impact of globalization and international trade on inclusive growth with a particular focus on local communities, published by the International Monetary Fund (IMF) finds that although international trade is closely associated with improvements in inclusive growth, growing inequality in many countries can be attributed to simultaneous increases in trade competition. Bacchetta and his colleagues, in their literature review to explore the relationship between global trade and inclusive local development, conclude that "more can be done to enhance inclusive trade," noting that some studies show overall benefits from trade, while others show adverse effects as they identify policies that can improve inclusive trade growth. The authors stress that operational action at the multilateral level can also improve inclusive local development by addressing distortion and market access and reducing price volatility. Concluding, the study highlights the role that the World Trade Organization (WTO) should play in supporting an open and inclusive global trading system that will promote inclusive local development (Bacchetta *et al.,* 2021). Davoodi and his colleagues examined the literature on the relationship between macroeconomic stability and inclusive growth as part of a study for the International Monetary Fund. They investigated the role of macroeconomic policies (fiscal, monetary, macro-prudential and exchange rates) and measures of participation (income inequality, consumption inequality, wealth inequality, poverty and unemployment) in different countries at different income levels. They found that avoiding pro-cyclical macroeconomic policies and mitigating macroeconomic volatility should be on the agenda of all policies interested in promoting inclusive and sustainable growth (Davoodi *et al.,* 2021).

In addition, according to academic and institutional texts, there are important theoretical and empirical references that suggest to focus social protection policies research on a local approach to inclusive and sustainable development. Around 6.25 billion people will live in urban areas by 2050 (Ritchie and Roser, 2018). Turok (2010) suggests that regional and local

approaches to development provide multiple benefits for inclusive growth: (1) allow new approaches to inclusive development to be developed and tested in a local area, with successful actions and good practices in local communities and then used in other regions with a relevant level of development; (2) the focus of inclusive development policies on local communities at (urban-urban level) allows for a consolidation of actions and an approach with different local actors dealing with a unified objective, (3) also allows better targeting to social groups that may not have benefited from the increased standard of living of the region, (4) identifies the developmental potential of the local community, (5) and allows coordination of the political agenda of inclusive development at local community level, and (6) because the composition of development tends to be at local social level, they delimit development and actions for local development by adaptations of developmental policy in a specific local context. A social protection policy that is committed to overall development policies and the commitment of these policies and related indicators to national GDP that ignores local factors and differences in the development of local communities, such as the composition of local development (by sector, occupation, territorial cohesion and other important local factors) "cannot" contribute to "sustainable and inclusive local development". Politics tends to make compromises in favor of the economy (Kokkinou et al., 2018; Constantin, 2021; Koudoumakis et al., 2021), at the expense of social and ecological issues. Almeida and colleagues argue that the socioeconomic indicators point out the actual stage of the town's development for public policies targeting the town's sustainable development (Almeida, et al., 2017). Alexiadis, and Ladias, (2011) argue that regional growth is a complex phenomenon, based upon a number of factors, which shape, to a considerable extent, the regional policies. There is a need to re-evaluate regional policy to focus on implementing more innovative and region-specific development strategies. Hence, new analytical tools are needed. The relatively fragmented nature of the spatial patterns of mobility and persistence suggests that broad administrative regions are a poor basis for the implementation of policy (Alexiadis, and Ladias 2011). Sustainable development (Nijkamp, 2011; Almeida et al., 2017; Amoiradis et al., 2021) and inclusive development literature shows that achieving sustainability in the local government, without making trade-offs between economic, social and environmental goals, is rare. Ranieri and Ramos (2013) in their study for the International Monetary Fund (IMF) also highlight the concept of 'productive employment', as well as the difficulties in understanding the complex local interactions between development, poverty and inequality. A common feature of many institutional definitions is that they stress not only the importance of inclusive local development, but propose to include the growth that should reach the untapped parts of the local economy in order to increase overall output (Ranieri and Ramos, 2013). Lupton and Hughes in 2016 propose to define the concept that "the basic idea is that if we want to have societies with equal citizens and have less poverty, we need to focus on the economy and the relationships between economic and social policies at regional level" (Lupton and Hughes, 2016). Investment strategies and economic local development, productivity, skills, employment regulation and wages must be an integral part of efforts to achieve greater justice and social inclusion in the local community. Similarly, allowing more people to participate fully in economic activity must be fundamental to local development in prosperous and sustainable economies. Within this concept, Lupton and Hughes argue that there are different perspectives on "what" inclusive growth involves and on "what" it actually is at the local community level, and emphasizes that for some scientists this identifies, a "growth plus" model (Lupton and Hughes 2016; Lupton, 2017). Bibri and Krogstie conclude that the applied theoretical inquiry into smart sustainable cities of the future is deemed of high pertinence and importance-given that the research in the field is still in its early stages, and that the subject matter draws upon contemporary and influential theories with practical applications (Bibri and Krogstie, 2017). However, it should be stressed that while regions and cities clearly have an important role to play in developing new ideas (Kokkinou et al., 2018; Napolskikh and Yalyalieva, 2019) and applied operational strategies (Ruxho and Ladias, 2022a,b) for inclusive local development, this role is inevitably limited compared to the role of policies at national government level. It should be pointed out that local development policy makers have more responsibilities and may be responsible and framed by the relevant powers to stimulate growth in local communities and the sustainable development agenda is also an important scope of investment development strategies at local level to address broader

societal challenges. Investment strategies (Alexiadis and Ladias, 2011; Myakshin and Petrov, 2019) and economic local development (Pedrana, 2013), productivity, skills, employment regulation and wages must be an integral part of efforts to achieve greater justice and social inclusion in the local community.

2. The definition of social protection policies at local level within the concept of inclusive and sustainable development.

Inclusive and sustainable development must be precisely defined so as to allow for a clear (and, ideally, empirically operational) distinction (at any level) between truly inclusive social protection policies. It requires a new narrative that appropriately frames sustainable and inclusive local development and social protection policies in the context of recognition of de facto global interdependence, where the well-being of citizens in different countries at national, regional and local levels is seen as mutually dependent. Sharing operational social protection strategies and best practices to promote inclusive local development would assist in the sustainable development of such a new narrative.

However, governments and scientific bodies often fail to assess the potential of social protection policy to increase growth and spread its benefits more widely, especially in environments of low demand and low productivity. The downgrading of the criteria of social protection policies relative to those of macroeconomic, trade and financial stability policies is a key reason for the failure of many governments in recent decades to mobilize a more effective response to widening social inequality and stagnant median income as technological change and globalisation have concentrated in developing and strong economies and less developed regions. This economic policy imbalance is reinforced by the current measure of national economic performance, gross domestic national product (GDP), which measures the total amount of goods and services produced in a national economy. In real social life, most citizens assess the economic progress of their respective countries, not by published national statistics on GDP growth, but by changes in the living standards of their households at the local level. This assessment includes a multidimensional assessment model that integrates income, employment opportunity, financial security, and quality of life at local level. However, even today, GDP growth remains the primary criterion and focus of social protection policy analysis of both policymakers and the media and remains the key measure of economic success. A firm commitment to measuring GDP reinforces political and business leaders' attention to macroeconomic and financial stability policies, which affect the overall level of economic activity. On the contrary, it is proposed that in a social protection policy in the context of sustainable and inclusive local development, special attention should also be paid to areas such as the management of local natural resources, specific local climatic connections, protection of the local natural and cultural environment, local development of skills and know-how, local labour markets, local competition and rents, local investors and corporate governance, infrastructure and basic local services, etc. These infrequently disregarded regional and local indicators are important in shaping economic activity and especially the extent of social participation and environmental balance in the process and benefits of local development. National GDP growth is seen as a measure of national economic performance in the sense that it is a measure of social success at the lowest level of social well-being. Consequently, social protection policy makers and citizens would benefit from having an alternative proposal, or at least one complementary measure of lower local level of social well-being and local environmental balance that measures the local level and rate of local economic improvement as well as the common socio-economic progress at both state level and inclusive and sustainable development. For the purposes of our study, based on all the interpretations offered by the institutional texts, the scientific interpretation and the operational practices followed by scholars and political decision-makers in social protection and in their effort to delineate, the concept of sustainable and inclusive local development suggest that it is necessary to give a more specific definition. However, given the impressive amount of scientific research analysed by literature research for the needs of the study, which is characterized on the one hand by a wide variety of basic research and institutional policy papers in economic and social science, the researcher reasonably wonders: “How can it be organised in an order that distinguishes the important from the insignificant and, above all,

highlights 'laws and regularities' that could define social protection policies at local level in the context of the concept of inclusive and sustainable development?"

Based on the literature and the identification of social protection policies in the context of defining the concept of inclusive and sustainable development, the following delineation must be included: 1. It has broader objectives for the local community beyond increasing income and national GDP and requires governments to work proactively in cooperation with local administration to achieve these goals at regional and local level; instead of assuming that positive national effects will come automatically through GDP growth in local communities. The benefits of national and regional economic development must also be translated into local human development and increased local social welfare; 2. Benefits should be channeled to all local social groups, including the most marginalized, 3. Take into account the reduction of poverty and social inequality at regional and local level 4. To focus on local social participation, not only on the results of distribution, and therefore to focus on increasing the active participation of all citizens of the local community, in the local economy and in how the local economy develops. 5. To promote the local sustainable use of natural resources and environmental protection in the context of climate change policies and the Sustainable Development Goals.

Throughout this debate on social protection policies in the context of sustainable and inclusive local development at global, European, national, regional and local level there is also the related debate on the availability and reliability of data and methodologies that will measure inclusive growth at national, regional and local levels. Studies with a series of social indicators concerning the demographic characteristics of the population such as age, gender, marital status, education and a combination of the above as well as key economic indicators such as GDP, attempt to investigate the social but mainly the economic performance of the study area.

3. Global, European, National and Regional Indicators for measuring social protection at local level in the context of inclusive and sustainable development.

The widely used measures of social inequality is the Gini coefficient12,13 which measures dispersion statistics and represents the distribution of income or wealth of a nation's inhabitants and is the most commonly used measure of inequality along with the S80/S20 income distribution index, which measures the annual income of the richest 20% of households compared to the 20% of the poorest households (a higher S80/S20 ratio equals greater income inequality, while a lower index equals less inequality). In the European Union, Eurostat in cooperation with the National Statistical Authorities publish the relevant social well-being reports according to the indicator measuring Household Income and Living Conditions EU-SILC (See the relevant report for 2021 on the EU Household Income and Living Conditions Survey EU-SILC14). The Inclusive Growth Index (IDI index)15, designed by the World Economic Forum System Initiative, is an alternative to GDP index, that reflects the key criteria by which citizens assess their countries' economic progress. The Inclusive Development Index (IDI) assessment model presents the updated results and global ranking of 103 economies for which Data is available. The approach of multivariate and complex indicators such as the UNDP Human Development Index (HDI)[16] began in 1990 as a pioneering alternative indicator and added new elements to GDP to create a more comprehensive measure of social well-being. For example, to the criterion of inputs for well-being (income) it adds the measurement of outcomes in terms of socio-economic potentials

[12] For more information https://data.worldbank.org/indicator/SI.POV.GINI (Assessed 12 October 2024)

[13] For more information https://ec.europa.eu/eurostat/web/products-datasets/-/ilc_di12 (Assessed 12 October 2024)

[14]For more information https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Subjective_well-being_-_statistics (Assessed 12 October 2024)

[15] For more information http://www3.weforum.org/docs/WEF_Forum_IncGrwth_2018.pdf (Assessed 12 October 2024)

For more information http://hdr.undp.org/en/content/human-development-index-hdi (Assessed 12 October 2024)

achieved through longer lifetime and education. The Genuine Progress Indicator (GPI)[17] is a composite indicator that incorporates into its criteria approximately twenty-five (25) adjustments to personal consumption expenditure based on GDP. It weights personal consumption against income inequality, incorporates both the value of non-market activities and the social and environmental costs associated with market activity. Another approach was to design non-financial indicators, such as the Happy Planet Index (HPI), [18]which brings together different criteria of social well-being (without the GDP index) into a single index. According to the latest report, HPI "compares how efficiently residents of different countries use natural resources to achieve long, high lives of well-being.". Another approach is the Happiness Life Evaluation Index,[19] which refers to the use of subjective well-being or self-reported life assessment. The results of an assessment of life in the country or social group are obtained on the basis of annual surveys that ask respondents to use the Cantril rating to rate their lives on a scale of zero to ten on the day of the survey, with zero being the worst possible life and ten being the best possible life. The World Happiness Report[20] uses life assessment, happiness, and subjective well-being interchangeably.

The global initiative to find data and methodologies to measure social well-being launched by the Stiglitz-Sen-Fitoussi Commission (2009) has been ongoing for more than a decade, with significant progress with the OECD's Better Life Initiative[21] , which has been in operation since 2011 and has collected well-being data in many countries, in cooperation with many national statistical institutes in all corners of the world, which have launched their own national data collection programmes. Many of these programmes have been developed with technical support from the OECD statistical department and are broadly compliant with the multidimensional wellbeing framework used by the OECD at European, National and Regional levels. In the recent OECD study entitled "How is life? Measuring well-being, 2020" describes whether life is improving for citizens in 37 OECD countries and 4 partner countries. This fifth edition presents the latest data from an updated set of more than 80 indicators, covering current wellbeing outcomes, inequalities and resources for future well-being. In addition to a comprehensive analysis of well-being trends since 2011, this report explores in detail the 15 dimensions of the OECD's Better Living Initiative, including health, subjective well-being, social connections, natural capital, and more, and examines the performance of each country and its regions (OECD, 2020). [22]

Part of the OECD Action Plan on the Sustainable Development Goals (SDGs) "leaving no one behind" was developed in the relevant OECD reports to help member countries implement the 2030 Agenda for Sustainable Development and related social indicators in their national agenda. These reports provide a high-level overview of strengths; the weaknesses and performance of the Sustainable Development Goals and support countries to navigate the complexity of the goals and identify priorities within the broad 2030 Agenda[23]. The SDGs Dashboard[24] enables governments, policy makers, researchers, academics, and others interested in monitoring the SDGs to perform easy analysis through innovative visualizations and tools to search for data from global data sources. Users can customize interactive data tools for their Sustainable Development Goals, to monitor the progress of their country and regions and explore trends in specific goals and indicators related to

[17]For more information https://gnhusa.org/genuine-progress-indicator/ (Assessed 12 October 2024)
[18] For more information http://happyplanetindex.org/ (Assessed 12 October 2024)
[19] For more information https://ourworldindata.org/happiness-and-life-satisfaction (Assessed 12 October 2024)
[20] For more information https://worldhappiness.report/ed/2019/changing-world-happiness/ (Assessed 12 October 2024)
[21]For more information http://www.oecdbetterlifeindex.org/#/11111111111 (Assessed 12 October 2024)
[22] For more information OECD (2020), How's Life? 2020: Measuring Well-being, OECD Publishing, Paris, https://doi.org/10.1787/9870c393-en. http://www.oecd.org/statistics/how-s-life-23089679.htm (Assessed 12 October 2024)
[23]For more information https://www.oecd.org/sdd/measuring-distance-to-the-sdgs-targets.htm (Assessed 12 October 2024)
[24] For more information http://www.sdgsdashboard.org/ (Assessed 12 October 2024)

inclusive growth. The SDG is[25] a global study that assesses each country's position in achieving the Sustainable Development Goals by adhering to social indicators. The Sustainable Governance Indicator network index[26], is an ongoing survey on sustainable policy capacities, governance and social protection across OECD and EU countries. Finally, Eurostat's report on the Sustainable Development Goals for Europe[27] is of interest, as an independent quantitative and qualitative report on the progress of the European Union and its Member States towards prosperity and sustainable and inclusive growth.

4. The European Union's social protection policies at local level in the context of inclusive and sustainable development

In the context of a historical retrospection, the implementation of social protection policies in the context of sustainable and inclusive growth policy in the EU began in 2001 when the EU strategy for sustainable development was launched[28], which was reviewed in 2006[29] and revised in 2009[30]. Since 2010, inclusive growth has been mainstreamed into the Europe 2020 strategy[31] and the Europe 2020 strategy [32] and expanded as a continuation of key EU policies in "Sustainable Development 2030".[33] The "Europe 2020" and "Sustainable Development 2030" strategies revolve around education and smart innovation, low carbon, climate resilience, environmental "sustainable" impact, "social equity" job creation, poverty reduction, social inequality, inclusive growth. For the European Union in particular, inclusive growth is the third pillar of the 'Europe 2020 Strategy' [34]and is defined in principle as follows: "Inclusive growth means empowering people through high levels of employment, investing in skills, fighting poverty and modernising labour markets, training and social protection systems helping citizens prepare for and manage change to build a cohesive society. It is also important that the benefits of economic growth spread to all parts of the Union, even to its most remote regions, thus strengthening territorial cohesion." The integration of the "Europe 2020" strategy for inclusive growth into the European Strategy for Inclusive and Sustainable Growth 2030 will be twofold. The first pillar, presented in the European Commission's Communication "Next steps for a sustainable European future: European action for sustainability",[35] consists of fully integrating the Sustainable Development Goals into the European policy framework and the current priorities of the European Commission, the existing assessment and identification of the most important sustainability issues. Under the second axis, studies will be launched to further develop the EU's long-term vision and orient sectoral policies after 2020, in preparation for the long-term implementation of the Sustainable Development Goals (SDGs) related to inclusive growth. The new post-2020 multiannual financial framework will also redirect contributions from the

[25]For more information, https://www.sdgindex.org/about/ (Assessed 12 October 2024)
[26]For more information, https://www.sgi-network.org/2020/ (Assessed 12 October 2024)
[27]For more information, https://ec.europa.eu/eurostat/web/sdi (Assessed 12 October 2024)
[28]For more information, COM/2001/0264 final https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2001:0264:FIN:EN:PDF (Assessed 12 October 2024)
[29]For more information, https://data.consilium.europa.eu/doc/document/ST-10917-2006-INIT/en/pdf (Assessed 12 October 2024)
[30] For more information, COM(2009) 400 final https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0400:FIN:EN:PDF (Assessed 12 October 2024)
[31]For more information, COM(2010) 2020 final. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF Assessed 12 October 2024)
[32] For more information, COM/2014/0130 finalhttps://eur-lex.europa.eu/legal-content/EL/TXT/HTML/?uri=CELEX:52014DC0130&from=IT Assessed 12 October 2024)
[33]For more information, https://ec.europa.eu/info/publications/reflection-paper-towards-sustainable-europe-2030_el Assessed 12 October 2024)
[34] For more information, COM(2010) 2020 final) – Europe 2020: A strategy for smart, sustainable and inclusive growth
[35]For more information, https://eur-lex.europa.eu/legal-content/EL/TXT/PDF/?uri=CELEX:52016DC0739&from=SK (Assessed 12 October 2024)

EU budget towards achieving the EU's long-term objectives of inclusive local development under the Sustainable Development Goals.

Today Europe is home to the most equal societies in the world, the highest standards of working conditions and broad social protection, and integrates it into its strategy for inclusive growth. The European Parliament, the Council and the Commission proclaimed the European Pillar of Social Rights in 2017 at the Gothenburg Summit. The Pillar sets out 20 key principles representing the beacon guiding us towards a strong social Europe that is fair, inclusive and full of opportunities in the 21st century. The European Commission stresses that more needs to be done to ensure that the 20 principles of the Pillar help us build fairer and more well-functioning labour markets and welfare systems for the benefit of all Europeans. With the European Pillar of Social Rights Action Plan https://ec.europa.eu/info/european-pillar-social-rights/european-pillar-social-rights-action-plan_en, the European Commission has developed concrete initiatives to achieve just that. Achieving the Pillar is a joint effort of EU institutions, national, regional and local authorities, social partners and civil society. To grow, strengthen, become more resilient, and remain a key player on the global stage, Europe will need to address its institutional and regulatory concerns about inclusive growth as it structures its operational strategies at European, national, regional and local levels and regain the trust of its citizens. With feedback from EU institutional and operational actions for inclusive growth, European citizens are more likely to engage with this vision and encourage their political leaders to support business action that can sustain inclusive local development and the social contract model for Europe's prosperity.

The social transition towards sustainability and inclusive local development must also continue to help Member States and regions develop both upwards and converging with each other, while avoiding wider regional injustice and inequalities in the EU within and between urban and rural areas. For example, although 75% of EU territory belongs to rural areas, more than two-thirds of the EU population reside in urban areas They generate up to 85% of EU GDP, account for around 60-80% of energy consumption and together face challenges such as congestion, lack of adequate housing, air pollution and infrastructure degradation [36].

For the EU, inclusive and sustainable development at local level, social protection, solidarity and prosperity are virtues in themselves but also constitute the very fabric of our free and democratic local communities. The transition to sustainable and inclusive local development can only be successful if, at the same time, in the context of social protection, it excludes no one, starting with the development of local communities. The definition towards inclusive local development in the EU therefore means economic growth, the promotion of social protection and the environmental balance of local communities in all regions of the EU, which in turn, will contribute to the social cohesion of the Member States and throughout the EU.

5. Reflections on European and national social protection policies in the context of social protection at local level in the framework of inclusive and sustainable development.

The global scientific and institutional community, European policy at national, regional and local level may have set goals for inclusive and sustainable development, but many stocktaking studies of these policies show that they do not have sufficient results and rely on insufficient institutional and operational immediate means to achieve them, especially at regional and local level. Such institutional and operational labelling may be useful in increasing pressure on Member States and the regions of states, but it can also lead to frustration, such as perceived promises that are not kept. For this reason, it is necessary to identify and delimit the failures that led the institutional and operational plans of development to economic distortions and widened social inequalities, especially in the employment of vulnerable groups, and to promote good practices in planning and exercising inclusive and

[36]For more information, United Nations Sustainable Development Goals, Goal 11: Build safe, resilient, sustainable and inclusive cities. Available at: https://www.un.org/sustainabledevelopment/cities/ (Assessed 12 October 2024)

sustainable development policy at local level in countries of the European Region and make sound suggestions for feedback on institutional and operational strategies.

They should also be complemented by further action, recognising that all policies are interdependent, while taking into account new challenges and new facts and evidence as they emerge. Defining the concept of inclusive and sustainable development at local level in the context of sustainable local development "leaving no one behind" the poor and marginalized, low-income citizens are those most dependent on natural resources such as land, water, fish and forests. They are also the ones most affected by climate change, as global conditions for sustainable local development and climate change prohibit or no longer restrict them from exploiting natural resources (e.g. some global, national, and regional societies will not be able to limit CO2 under global climate change treaties make the most of natural mineral resources such as oil, lignite, etc.).

Education, science, technology, research and innovation are a prerequisite for achieving a sustainable EU economy that meets the Sustainable Development Goals. Efforts to raise awareness, broaden our knowledge and improve our skills towards sustainable education should continue, and partnerships between local universities and research institutions and community decision-makers should be encouraged in the context of inclusive and sustainable development at local level. Education, training and lifelong learning are essential to create a culture of inclusive and sustainable development in local communities. EU leaders agreed to work together to create a European Education Area by 2025, to unleash the full potential of education, training and culture as drivers for job creation, economic growth and social fairness. Education is both a virtue and an invaluable means of achieving inclusive and sustainable growth in local communities. Improving equal access to quality and inclusive education and training at all stages of life, from early childhood to tertiary education and adult learning, must therefore be a key priority. Educational institutions at all levels should be encouraged to adopt the Sustainable Development Goals as a guide for their activities and be supported to become places where sustainability skills are not only taught but actively applied in practice in partnership with local communities. Reform and modernisation of education systems should also be pursued, from building green schools and facilities to developing new skills for the digital economy in local communities (Sepetis et al., 2020).

Social dialogue, as well as public and voluntary measures by the private and public sectors for social protection at European, national and regional level, also have an important role to play in this context. Creating synergies and modernising our local economy also sometimes involves difficult compromises. While new jobs will be created in the transition towards sustainable local development, traditional jobs may disappear or transform, including through digitalisation and automation, creating temporary frictions in the local labour market. Regarding the local labour market, for example, it is currently unclear what the exact impact of AI will be. Although many households are struggling to make ends meet, there is a growing public understanding that we need to change our ways of producing and consuming. However, not only can these challenges hit the middle and lower income classes relatively harder, but the costs of environmental upgrading of their homes, cars or skills, for example, can also place a greater burden on them. This transition has consequences for those employed in the affected local businesses and sometimes for entire regions. In addition to promoting inclusive and sustainable development at local level as a foundation for creating decent jobs in local communities, it can also have notable positive and negative impacts on public health.

EU chemicals legislation has made an important contribution to ensuring a high level of human health protection. Over the past four decades, human and environmental exposure to hazardous substances has decreased dramatically. EU legislation has also helped reduce exposure to certain carcinogens in the workplace and has led to an estimated one million new cancer cases in the EU in the last 20 Years. The European Environment Agency's research "Healthy environment, healthy lives: how the environment influences health and well-being in Europe in 2020"[37] found that clear opportunities to address individual environmental risk

[37] For more information EEA 2020 Healthy environment, healthy lives: how the environment influences health and well-being in Europe https://www.eea.europa.eu/publications/healthy-environment-healthy-lives (Assessed 12 October 2024)

factors should be taken without delay, while also taking into consideration their potential impact on other stressors and, where possible, adjusting existing policy measures to address multiple stressors through innovative and integrated approaches. The precautionary principle provides a basis for action, to protect health and the environment on the basis of early evidence of harm. At the same time, there are specific environmental risk factors and emerging issues of concern that warrant further attention from researchers. In particular, the environment and health community would benefit from greater clarity regarding the linkages between the environment, social and health dimensions, including the influence of social status, behaviours and consumer choices. Research designed to deliver societal benefits should investigate and disseminate social and technological innovations that can support improvements in environmental health (EEA, 2020). The European Horizon project entitled CARING NATURE[38] project has the ambition to develop and test 10 innovative solutions to reduce the impact of the healthcare sector on the environment, without interfering with the safety of patients and operator. Sepetis argues that social responsibility, environmental management and corporate governance are at the forefront of attention, not only as the most up-to-date features of a public health and social protection strategy, but also in relation to national and international economic policies aimed at better economic outcomes for local communities and stakeholders (Sepetis, 2019, 2020; Zaza et al 2021; Sepetis et al 2022; Sepetis et al 2024).

Research at European level on the anatomy of inclusive growth in Europe, Darvas and Wolff (2016) answer the question “Why is inclusive growth important?”:

- ✓ When assessing inclusive growth, poverty and income inequality are among the two most relevant indicators, although there are many others, including non-financial indicators. Income inequality and poverty have an impact on inequality of opportunities and prospects for social networking and mobility, with significant consequences for individuals and societies.
- ✓ Their research shows that in most European countries, children growing up in poorer and disadvantaged families tend to perform poorly in school compared to their peers from wealthier families. Education and its inadequate achievement leads to low employment rates. They conclude that people with a low level of education tend to have poorer health and shorter life expectancies. They point out that an economy cannot be considered inclusive if opportunities for advancement depend on family background.
- ✓ Inequality and poverty also affect the prospects for social convergence between regions, generations and families belonging to different socio-economic groups.
- ✓ Higher income inequality is related to social mobility: children of poor families tend to become poor, while children of rich families tend to become rich. The same result applies to children in countries with very good educational achievement. Nordic countries, such as Finland and Denmark, show low-income inequality and relatively high social mobility. Southern European countries such as Italy and the United Kingdom are characterized by high income inequality and relatively low social mobility.
- ✓ Literature research on the impact of income inequality over the long term shows that growth policies have mixed effects, but there is growing evidence that inequality was also a determinant of unsustainable increases in many European countries. Countries with the highest inequality tended to have higher borrowing to households before the crisis, which led to weaker consumption growth during the crisis. Higher private debt made economies more vulnerable and contributed to higher unemployment and higher levels of poverty.
- ✓ High levels of income inequality and poverty can also boost protest voting in referendums and elections. Econometric estimates reveal that in the UK's Brexit referendum in June 2016, income, inequality and poverty were factors that drove the "pro-Brexit" vote.

The McKinsey Global Institute (MGI) survey[39], “Testing the Resilience of the Inclusive Growth Model in Europe” in 2020, focuses on the prospects for inclusive European growth in

[38] For more information https://caringnature.eu/ (Assessed 12 October 2024)

39 For more information, New McKinsey Global Institute (MGI) (2020), Testing the resilience of Europe’s inclusive growth model , https://www.mckinsey.com/featured-insights/europe/testing-the-resilience-of-europes-inclusive-growth-model# (Assessed 12 October 2024)

the period up to 2030 and simulates the six major challenges40 that will address Europe's inclusive growth model as well as the European Social Pillar of the European Union (McKinsey, 2020). The overall conclusions of the study find that the principles and policies of inclusive growth in Europe, as well as the European Social Pillar of the European Union are under threat. According to the McKinsey study, the main reasons are:

- ✓ The limited growth of median income in recent years,
- ✓ The reduction of trust in institutions (both EU and national),
- ✓ Discomfort with mass migration,
- ✓ Security concerns as well as the resilience of global agreements;
- ✓ The rise of populist politics challenging the status quo.

The research argues that Europe must now respond to six global and interactive challenges that could increase inequality in and between EU Member States and increase social and economic divergence, further jeopardising inclusive growth and the EU's social contract. Europe needs to be proactive by testing new ways in which the new European Social Pillar could work in the case of employment, lifestyle, low carbon and technological ethics. Overall, however, the survey finds that Europe may be able to maintain the essence of its social contract in terms of welfare if it can provide all its current initiatives linked to, or even aimed at responding to, the six major challenges. Among the initiatives with the best results for inclusive growth, the EU and European countries may need to increase green and technological innovation and develop new skills. While social inequality will likely increase, as new social policies unfold, these new approaches could be funded by the returns of these policies and in the process, mitigate growing social inequality and help counteract the anti-EU. Emotion. Social divergence within Member States is likely to continue and needs to be addressed with the EU complementing Member States' actions. In their survey, they point out that significant challenges lie ahead. Trust in governments and institutions is low and there is likely to be increasing pressure for social inclusion over the next decade. An agenda to help strengthen Europe's inclusive and sustainable development model includes (but is not limited to) generating growth and sharing the benefits of such growth while trying to rebuild trust. Some of the decisions to be made are likely to require strong political mandates, which can be difficult in an era of diminished trust. However, a lack of action could leave Europe's inclusive growth model even more vulnerable. Therefore, stagnation is not an option according to research (MGI, 2020).

6. Summary of the doctrinal debate on designing and implementing social protection policies at local level in the context of inclusive and sustainable development

The description so far of the delineation of social protection policies at local level and the concept of sustainable and inclusive development highlights a reflection on the need to define a clear and common definition of inclusive and sustainable development at local level (and, in particular, a shift in the terms of the debate from Inclusive Growth to Inclusive Development).

The International Monetary Fund in its 2017 annual report states that although income differences between countries have narrowed, social inequality within countries in local communities increased from the mid-1980s to the mid-2000s, especially in advanced economies. Many factors explain these trends (IMF, 2017)[41]:

- ✓ Technological developments have mainly benefited capital owners and highly skilled workers.

40 The six major challenges that inclusive growth will face are: 1. ageing. 2. digital technology, 3. automation and artificial intelligence (AI) 4. increased global competition, 5. migration and climate change and 6. The shift in geopolitics

41 For more information, IMF. (2017): *FOSTERING INCLUSIVE GROWTH G-20 Leaders,* Summit, July 7-8, Hamburg, Germany https://www.imf.org/external/np/g20/pdf/2017/062617.pdf (Assessed 12 October 2024)

- ✓ International trade, which remains a vital growth driver in poverty reduction, combined with labor-saving technologies and outsourcing, has led to job losses and shifting migration to advanced economies.
- ✓ Financial integration, without adequate regulation for low incomes, can increase the vulnerability to financial crises of the socially weak and strengthen the bargaining power of capital.
- ✓ Domestic policies, in some countries, have reduced labor's bargaining power, increased business concentration, and made taxes less progressive and weakened social protections.

According to the World Economic Forum in 2017 around the world, leaders of governments and other stakeholders participated in the Forum addressing a number of difficult and increasingly urgent questions about low levels of local development. The main questions asked are:

- ✓ Will macroeconomics and demography determine the destiny of the world economy for the foreseeable future?
- ✓ Can growing inequality within the country and regions be adequately addressed within the prevailing liberal international economic order?
- ✓ Can those who argue that modern capitalist economies face inherent limitations in this regard, that their internal "income distribution system" is "wrong" and is likely to be proven wrong in addition to repair?
- ✓ As the technological revolution readjusts and accelerates rapidly to the Fourth Industrial Revolution, how can local communities better organize to respond to potential labor and other economic-social redistributions of wealth?
- ✓ Is the expanded redistribution of income through transfer of know-how the only or main solution, or can market mechanisms be developed to broaden social participation in new forms of economic value creation?

These questions raise the most fundamental question of whether a global correction to the existing model of economic growth is needed in order to address global economic stagnation and social inequality (chronically low growth and rising inequality). In their conclusions, they emphatically stress: “We need to reformulate the intellectual map of how national and regional economic performance is perceived and created by policymakers. and redefine inclusive development policies at national and local levels” (WEF, 2017).

Since the beginning of its mandate, the Juncker Commission has worked to mainstream sustainable development into its policies[42] and has already paved the way for the next generation of sustainable policies from the European Pillar of Social Rights, the new European Consensus on Growth to the values-based “Trade for All” strategy, the strategic engagement for gender equality and the European Education Area, from the Circular Economy Package, the “Europe on the Move” and Energy Union to the Blue Growth Strategy and the Bioeconomy Strategy and from the Sustainable Finance Investment Plan and Action Plan to the Urban Agenda for the EU and the Nature Action Plan among others. The Juncker Commission presented a strategic, long-term vision for a prosperous, modern, competitive and climate-neutral EU economy by 2050 (EU, 2018). This vision paves the way for a structural transformation of the European economy, thereby boosting sustainable growth and employment.

To make social protection a success in the context of inclusive and sustainable local development and to put our society on a sustainable local path, we must ensure that global

[42] Annex 3 of the reflection paper presents in more detail the most important initiatives of the Juncker Commission, contributing to the UN 2030 Agenda and the Paris Agreement.

and EU and Member State policies help all European citizens in each region to make this change, including equipping them with the necessary skills at regional and local level.

As part of local entrepreneurship for sustainable and inclusive local development over the past two years, the EU has strengthened the rights of shareholders[43]and investors[44] by helping local shareholders and investors understand both financial and non-financial aspects of local business performance and by giving them greater capacity to hold them accountable to local communities. The EU has also introduced new environmental and social criteria in its legislation on public procurement, social procurement and social impact investments to encourage local businesses to develop socially responsible products and services. Rakitovac and Bencic (2020) recently stated that municipal social responsibility is a permanent commitment of local authorities to transparently provide public services that will improve the quality of life of their citizens and enhance sustainable competitiveness by co-creating a supportive business environment. Social entrepreneurship, which aims to solve problems at local community level, can also play an important role in addressing sustainable development challenges while fostering inclusive growth and job creation at local level, shared prosperity and social inclusion. Social enterprises today tend to concentrate in niche markets, especially at local level, and find it difficult to expand in the EU. Funding remains a major problem, which is why the EU is allocating more funds to social enterprises. As with the collaborative economy, complex regulation or the absence of a regulatory framework and constraints at local level can be an obstacle. As Yarimoglu et al. (2015) summarize the main difference between the private and public sector is that social responsibility activities can be more charitable in municipalities since their main goal is not profit and also their tasks are almost the same as the nature of social responsibility activities. Furthermore, Rani and Hooda (2013) emphasized that the goal of government social activities is to establish integrity between business and society, by developing “social municipality management”.

There is a need to further focus on linking sustainable finance with the real economy of local communities in the context of inclusive and sustainable development at local level, so that increased investor demand for sustainable local products and services is matched by increased supply. Effective pricing of externalities will be crucial in this regard. In addition, additional efforts should be made to inform European citizens about the financial system, so that they know better the corporate activity they finance and how to hold fund managers to account if their money is not managed sustainably. The EU is leading the overall transition of the financial system to a sustainable path with the following measures (Sepetis, 2020; EU Sustainable Finance, 2020).

Ensuring a locally and socially just, equitable and inclusive transition will also be it will also be crucial for the public acceptance of the steps needed and to make the transition a success for all. This means greater and fairer participation in the local labour market, while focusing on job quality and local working conditions. It also implies respect for minority rights. In this context, orderly, legal and well-managed migration can create opportunities for the European economy by addressing the problem of demographic change, both in migrants' countries of origin and destination. The social inclusion and full participation in local communities, cultural, social and economic, of all migrants residing fairly and legally in the EU is a shared responsibility and is vital to ensure social cohesion[45].

The main framework for the EU to move towards social protection at local level and inclusive and sustainable development is the European Pillar of Social Rights, as proclaimed by the EU institutions in November 2017. The aim of the Pillar is to guide a renewed process of improving local working and living conditions. It lays down basic principles and rights in the employment and social fields at national, regional and local level. The EU's focus on inclusive local development must now focus on implementing the European Social Pillar. The

[43] For more information, (EU) 2017/828 of the European Parliament and of the Council of 17 May 2017 amending Directive 2007/36/EC as regards the encouragement of long-term shareholder engagement (Text with EEA relevance)

[44] For more information, 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups (Text with EEA relevance).

[45] For more information, COM(2016) 377.

EU and Member States should also ensure that the implementation of the Social Pillar helps equip people with the right skills for the right jobs geared towards the green economic transition in local communities.

For the EU, sustainable and inclusive local development, social protection, solidarity and prosperity are virtues in themselves but also constitute the very fabric of our free and democratic local communities. The transition to sustainable and inclusive local development can only be successful if, at the same time, in the context of social protection, it excludes no one, starting with the development of local communities. The definition towards inclusive local development in the EU therefore means economic growth, the promotion of social protection and the environmental balance of local communities in all regions of the EU, which in turn, will contribute to the social cohesion of the Member States and throughout the EU.

7. Conclusions

At national, regional and local level, social protection policies in the context of inclusive and sustainable development are likely to contribute to processes of increasing social exclusion and environmental degradation at local, regional and national level, if multilateral impacts and the multidimensional nature of local communities are not taken into account. Scholte in 2019 also points out the contradiction that even when ideas of liberal globalization and institutions of global governance are attacked by populist nationalism in local societies, the actual processes of globalized production, distribution and consumption continue. Therefore, he argues that the dynamics produced by globalization and its results feed the new realistic upheavals at global, national, regional and local level and affect directly or indirectly the development of local communities. In such a political context, giving up on the struggle to preserve and improve the ideals and institutions of global governance would be nonsense. Only when the benefits of globalisation can be expressed in a more understandable human way, and demonstrated in a fairer and more sustainable way at national, regional and local levels, will it be possible to convince those left behind that globalisation can be good and become a guide to mitigate nationalist populism in local communities (Scholte, 2019).

A fundamental principle to enable inclusive and sustainable growth for the European Union is to leave no one behind "locally inclusive". It is simply not within this principle that we can successfully make the transition to sustainable local development at the expense of groups of people, communities, sectors or regions. For the European Union, all members of society should have equal opportunities to contribute to a sustainable European future in every local community and benefit from the transition. In particular, we must enable women and the particularly vulnerable and marginalised social strata of local communities to enter the labour market and pursue economic independence.

In the context of Inclusive and Sustainable Development at local level, regions, cities, local stakeholders, local chambers, must harmonise the basic principles of their policies and objectives and take an active role in fulfilling the national and regional/local objectives of Inclusive and Sustainable Development.

In addition, local communities should highlight local dynamics and socio/cultural culture to promote local innovation/know-how and local entrepreneurship, in order to promote public and private investments in the local needs of society and especially in crisis management areas, such as fire-stricken areas.

The study proposal for the basic principles that will define social protection policies in the context of Sustainable Local Development Inclusive should include the following delineation:

(1) Development *of a* common *"vision"* for *"Inclusive and Sustainable Development at local level"* to many stakeholders and businesses of the local community, so that the common *"vision"* becomes a common *"mission"*.

(2) Development policies should have broader objectives than income and GDP growth and require national and regional/local authorities to cooperate, work proactively, monitor, control and feed back into planning to achieve these objectives taking into account: a) adaptation to global, national, regional/local development policies and b) not assume ex officio that positive social outcomes will come automatically through economic growth.

(3) The benefits of development policies must be channeled holistically to all social groups, including the most marginalized *"leaving no one behind",* by promoting social cohesion policies and involving local communities in development policy decisions.

(4) Social protection development policies and business strategy should take into account, within a holistic approach, the emergence of local dynamics and social/cultural culture to promote local innovation/know-how and local entrepreneurship, while increasing employment, reducing poverty and social inequality of local communities.

(5) A key importance of the holistic social protection strategy is the involvement and alignment of the efforts of "development actors" (governmental/local bodies, universities/research bodies, businesses, chambers, business bodies, etc.) with those of "inclusion" stakeholders (governmental/local bodies, universities/research bodies, social inclusion and cohesion bodies, NGOs, associations, etc.) in a commonly accepted business strategy. By jointly agreeing on definitions and metrics to monitor implementation progress and control the holistic business strategy.

(6) The holistic social protection business strategy at local level should propose the procedures in each region/local community on “how” to implement inclusive and sustainable development. The implementation processes of the proposed holistic business strategy will identify the empirical application of the operational and political “vision” and stakeholders, where the economic prosperity of the local community must create broad bases and have social and environmental benefits for all.

(7) The holistic operational strategy of social protection development policies to promote the sustainable management of local natural resources and local environmental protection in the context of national, European and global climate change policies and sustainable development goals.

Within this framework of social protection policies, regions, cities and local communities must harmonise their objectives and take an active role in meeting national objectives for the economy, while adapting public and private investment and service provision to local needs. To this end, it is proposed that each Region prepares “Regional Strategies for Inclusive and Sustainable Development at Local level”.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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MAPPING THE PSYCHOLOGICAL LANDSCAPE OF SOCIAL PREFERENCES AND ATTITUDES TOWARDS VOLUNTARY INSURANCE PRODUCTS IN THE WESTERN BALKAN REGION

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Abstract

This study investigates the factors affecting demand for voluntary life and non-life insurance in the Western Balkan region, focusing on age and gender preferences. Using the Mind Genomics technology in an online experiment, 2,448 participants from Albania, Bosnia-Herzegovina, Montenegro, North Macedonia, Serbia, and Kosovo provided insights. The research identified four meaningful categories of interest. The most preferred insurance products across all demographics were those for livestock, crops, agricultural tools, machinery, and motor vehicle liability. Additionally, pension plans were noted as promising for retirement income planning. The study suggests that financial institutions should tailor their awareness strategies to these preferences.

Keywords: age, gender, mind genomics, preferential voluntary insurance products, Western Balkan region

JEL classification: C3, G22, G52

1. Introduction

This research paper examines preferred approaches to voluntary insurance portfolio products, focusing on the attitudes of citizens in the Western Balkan region. The goal is to identify opportunities for insurance market growth, considering the significance of primarily voluntary insurance as an essential risk management tool in low-income countries. Therefore, it is crucial to emphasize the importance of financial awareness, particularly in Western Balkan region countries like Albania, Kosovo, North Macedonia, Serbia, Bosnia-Herzegovina, and Montenegro, which lack historical experience in this area. In these countries, increasing financial awareness may boost public understanding of insurance.

During the early 1990s, following their post-communist era, the Western Balkan countries transitioned from centralized economic systems to open markets. Since then, they have experienced significant economic growth, largely driven by the development of their financial sectors. In response to market demands, insurance markets have evolved with mechanisms for transferring risks. Nevertheless, voluntary insurance markets currently face challenges. One primary reason is that the population has become accustomed to social welfare systems in which only state-owned insurance companies operate with limited options, thus monopolizing the market (Sharku and Bajrami 2021).

Over the years, the existing state-owned insurance companies have transferred ownership to new private insurance companies, primarily foreign (Kozarevic et al. 2011; Curak et al. 2009; Tipurić et al. 2008; Pye 2005). As a result of these circumstances, these companies have been required to expand their portfolio. Furthermore, in order to meet the requirements for European Union accession, the Western Balkan countries have implemented

various reforms in several areas. Thus, reforms related to the risk management and regulation of insurance companies were necessary to comply with the Solvency I and II European directives (Linder and Ronkainen 2004). However, despite these interventions, the insurance market remains underdeveloped.

In general, the Western Balkan countries tend to focus more on non-life insurance products (Insurance and Risk Financing Opportunities in Western Balkans 2024 report). These include accident insurance, land vehicle insurance, property insurance against fire and natural disasters, insurance for other types of property damage, and motor vehicle liability insurance. On the other hand, life insurance products such as debtor's life, group life, combined life, travel life, and health plans are less favored. Similarly, cash plans and life with savings are not as popular in these countries.

According to the Insurance and Risk Financing Opportunities in Western Balkans 2024 report, Bosnia-Herzegovina stands out as the Western Balkan country with the highest inclination towards life insurance products, accounting for 37.5% of the market. However, non-life insurance products are more popular in the country, representing 62.5% of the insurance market. Montenegro follows closely behind, with life insurance products making up 19.6% of the market share, while non-life insurance products hold a significant majority at 80.4%. Serbia ranks third in terms of preferences for life insurance products, which only contribute to 11.3% of the overall market share, while non-life insurance dominates with an 88.7% share of the market. In Kosovo, life insurance products account for 9% of the market, while non-life insurance products are preferred and make up 91% of the market. In Albania, life insurance occupies 7.02% of the total market share, with non-life insurance being the most preferred at 92.98%. Among Western Balkans countries, North Macedonia has a lower preference for life insurance products compared to others, representing only 4.43% of the market. Non-life insurance products are the most preferred in North Macedonia, with a significant share of 95.57%.

It is necessary to note that the insurance and finance sector in the region heavily depends on traditional distribution channels, such as agents and intermediaries, for sales and customer acquisition. This approach has hindered the adoption of modern technology and digital marketing methods, which are transforming the global insurance business landscape (Insurance and Risk Financing Opportunities in the Western Balkans 2024). Additionally, there is considerable untapped potential for collaboration between banks and insurance companies, which limits the diversification of financial services and overlooks cross-selling opportunities.

A substantial body of literature exists on the determinants of demand for voluntary life and non-life insurance products (Lin et al. 2017; Elango and Jones 2011; Feyen et al. 2011). Some researchers (Dragota et al. 2015; Dragoş et al. 2020) analyze behavioral factors related to voluntary insurance such as socio-demographic factors, general behavioral factors, specific behavioral factors, as well as insurance knowledge. Other studies focus on buying motives (Url 2017; Tamulienë and Pilipavicius 2017) along with trust and experience.

The main objective of this research study is to further investigate and depict the primary factors that influence the demand for both life and non-life voluntary insurance products, as well as people's preferences towards these products. This study focuses on various aspects of the insurance market in Western Balkan countries and their social preferences for voluntary insurance products. It should be noted that there is no other survey-based study addressing these issues together, making this study unique.

To gain insights into people's minds, a well-known technology called Mind Genomics is employed. Mind Genomics utilizes advanced technologies such as statistical regression models, data mining, and clustering techniques to conduct a multifactorial analysis of numerous factors that impact the decision-making process (Moskowitz et al. 2006; Moskowitz et al. 2012).

Another ultimate objective of this paper is to provide line institutions with valuable insights to consider in the financial awareness process concerning voluntary insurance products, which aim to capitalize on the growing opportunities in the insurance market. The remaining sections of this paper are structured as follows: the methodology section outlines the data utilized for analysis and the scientific approach employed; the results and discussions section presents a comprehensive list of findings derived from this study. Lastly, the

conclusions and policy implications section summarize the key findings obtained from this research.

2. Literature review

Insurance products play a crucial role in transferring financial risk and managing unforeseen events. As a result, the insurance sector is essential for the economic and financial development of countries. Life and non-life insurance products serve individuals, businesses, and the overall economy by offering vital functions. To ensure successful business development in insurance, companies must focus on relevant insured segments and efficiently address their insurance needs and expectations (Kiyak and Pranckevičiūtė 2014). Understanding the insured's preferences, needs, expectations, and behavior in the insurance market allows insurers to make informed decisions, develop effective marketing campaigns, and implement measures to encourage potential customers to choose their company or adjust their behavior according to desired outcomes (Kindurys 2008).

Various studies have reported on the macroeconomic and microeconomic factors that influence insurance decisions (Kurdyś-Kujawska and Sompolska-Rzechuła 2019; Tsendsuren et al. 2018; Dragoş et al. 2020, 2017; Lin et al. 2017; Kiyak and Pranckevičiūtė 2014; Elango and Jones 2011; Feyen et al. 2011; Ulbinaitė 2010). Other research on this topic (Dragoş et al. 2017; Dragota et al. 2015) has delved into the analysis of behavioral factors influencing insurance decisions, including socio-demographic factors, general behavioral factors, specific behavioral factors, and insurance knowledge. This last aspect is crucial as certain insurance products are still not widely utilized. To address this issue, several studies suggest that improving consumer awareness and the quality of employment in the insurance sector is necessary. This can be referred to as "insurance education" (Waseem-Ul-Hameed et al. 2017; Dalkilic and Kirkbesoglu 2015; El Monayery 2013). Additionally, there are further studies that focus on customer preferences (Tamulienë and Pilipavicius 2017) and the factors influencing buying motives, trust, and experience with voluntary insurance products (Url 2017).

In the case of voluntary non-life insurance products, it has been confirmed that customers tend to favor products recommended by intermediaries such as property and motor vehicle liability insurance (Dominique-Ferreira 2017). Moreover, the Outreville (1996) research suggested that the preference for these types of products can even be influenced by national culture. Another study conducted by Kindurys (2003), found that price is the primary factor driving consumers' demand for voluntary non-life insurance products. However, this trend does not hold true for experienced customers and financial institutions (Pye 2005).

Several studies have been conducted to investigate insured preferences for voluntary life insurance products across different countries. These studies have identified several factors that significantly influence the choices individuals make regarding voluntary life insurance products. These factors include GDP per capita, inflation (actual, anticipated, or feared), the development of the banking sector, institutional indicators (such as investor protection, contract enforcement, and political stability), and dominant religion (Beck and Webb 2003; Outreville 1996; Browne and Kim 1993). Furthermore, researchers have also found that certain variables have a borderline impact on voluntary life insurance products (Poposki et al. 2015). These variables include education level, the old and young dependency ratio (the ratio of the population above the age of 65 or below 15 to the number of persons aged 15 to 64), urbanization rate, size of the social security system, life expectancy, and market structure.

In addition to the usual voluntary life and non-life insurance products, there are other complex insurance products available, such as agricultural and pension funds. It is worth noting that in recent years, farmers and forest business owners have been compelled to insure their agriculture-related activities and crops due to natural disasters, particularly climate-related risks like cyclones, floods, droughts, storms, landslides, and earthquakes. These types of insurance serve as a financial mechanism that aims to cover losses resulting from adverse weather conditions and similar events that are beyond the control of growers. Previous research conducted by Ghalavand et al. (2011) states that the main factors influencing

farmers' preferences for crop insurance are their level of education and business incomes. On the other hand, preferences towards livestock insurance are mainly related to economic cycles (Ghalavand 2005).

Livestock insurance policies in the region are relatively new compared to

traditional risk management strategies like hedging, using options, or entering into forwarding fixed or minimum price contracts. These techniques are also unfamiliar to farmers. Tversky and Kahneman (1974) observed that risk-averse farmers are more likely to insure during periods of lower prices rather than for potential gains. They also found that age and experience play a significant role in farmers' preferences toward livestock insurance. Specifically, Mohammed and Ortmann's (2005) study reveals that older and more experienced dairy farmers have less willingness to purchase livestock insurance. Additionally, farmers have utilized voluntary insurance to protect their agricultural assets such as tools, machinery (production equipment, irrigation systems), agricultural buildings, and structures (Rola 2020).

In this context, the insurance preferences of farmers revolve around their

aversion to risk. However, several studies (Läpple and Van Rensburg 2011; Mzoughi 2011) provide evidence supporting a positive correlation between farmers' predisposition towards risk tolerance and their adoption of organic farming insurance practices.

Turning to complex insurance products such as pension funds, they are

commonly utilized by workers as a means to save money during their working lifes and utilize it during retirement. The objective behind these initiatives is to increase income during the final period while maintaining a consistent level of lifetime utility (Van Der Cruijsen and Jonker 2019). Similarly, Holt and Laury's study (2002) argues that pension funds are personalized for everyone’s pension income based on their current income in order to accurately reflect the trade-offs between risk and return.

State pensions and income taxes play a significant role in influencing pension

fund investment decisions (Fischer and Jensen 2015). Thus, the Salminen (1993) study explains that employers have taken the initiative to implement a decentralized pension fund scheme with private insurance companies as carriers.

Furthermore, due to the circumstances arising from the post-COVID-19

pandemic and extensive marketing campaigns, health insurance has recently become the most popular voluntary insurance product. There are two main reasons for its popularity: first, people have varying preferences when it comes to convenience in healthcare consumption; second, private contracts have long-term structures that incentivize individuals to enroll before their risk type is revealed (Polyakova 2016). However, in contrast to these findings, Geruso (2017) demonstrates that older individuals tend to enroll in more comprehensive plans compared to younger individuals with similar healthcare expenditures.

From several points of view, this research is the first attempt to comprehend

the main factors that influence the demand for voluntary life and non-life insurance products, as well as people's preferences towards these types of products in the Western Balkans. It investigates demographic factors like gender and age of individuals in or out of the active labor force, with the aim of adopting a comprehensive approach to this subject matter.

3. Methodology

3.1. Participants and Settings

An online survey was sent to 4.200 Western Balkans citizens, with 2.448 citizens

agreeing to participate. The majority of participants were female (52.2%) compared to male participants (47.8%). The breakdown of participants by citizenship is as follows: Albanian (ALB, 17.1%), Bosnian (BH, 16.2%), Montenegrin (MNG, 15.8%), Macedonian (NM, 16%), Serbian (SRB, 17.9%), and Kosovo's (KO, 17%).

A diverse team from Western Balkan countries, including Albanians, Bosnians,

Montenegrins, Macedonians, Serbians, and Kosovars, consisting of university students (24%), professors (20%), citizens (26%), as well as financial and insurance professionals (30%), were invited to participate in this study, regardless of their use of voluntary insurance products. The age distribution of participants is as follows: 16.2% are aged 18-24, 14.8% are

aged 25-34, 26.8% are aged 35-44, 12.2% are aged 45-54, 15% are aged 55-64, and 15% are aged 65 and above.

3.2. Data

Participants provided some personal data (see Table 1) such as gender, age, and citizenship by answering to four subjects/pillars related to voluntary insurance products preferences' such as: what do you think about buying voluntary insurance?; what kind of voluntary insurance options do you use?; which voluntary insurance policies related to agriculture and livestock are the most preferred?; is it interesting to invest in pension funds?.

The participants are invited to choose from a range of parameters regarding the use of voluntary insurance products, including:

1. Experience and Circumstances Play an Essential Role in Voluntary Insurance;
2. Voluntary Insurance Provides Financial Guarantees;
3. COVID-19 pandemic also affected decisions regarding voluntary insurance;
4. Voluntary Insurance is an Issue of Mentality.

Table 1. Demographic statistics of the study participants

	Gender			**Age**						**Environment**			
The demographic information of the participants	Total	Male	Female	18 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65+	Students	Citizens	Professors	Financial and insurance professionals
Base size	2.448	1.170	1.278	396	363	656	301	372	360	581	642	499	726
ALB	420	259	161	70	92	81	86	69	22	85	140	95	100
BH	398	162	236	64	72	78	69	70	45	102	95	120	81
KO	415	182	233	82	29	120	21	74	89	96	102	82	135
MNG	386	224	162	61	41	84	35	89	76	120	71	50	145
NM	392	176	216	78	67	95	29	41	82	91	116	92	93
SRB	437	167	270	41	62	198	61	29	46	87	118	60	172

Source: Mind Genomics experiment data

3.3. Mind Genomics experiment

This research utilizes Mind Genomics, a cutting-edge technology designed to investigate mental processes and individual variations in how people perceive and comprehend complex everyday information (Gofman et al. 2010; Moskowitz et al. 2006). Mind Genomics is a widely recognized statistical tool used for analyzing extensive data sets. This technology, available as a web-based service, employs sophisticated statistical regression models, data mining, and clustering techniques through experimental methods and computational models to assess and elucidate variances in individuals' responses to stimuli (Moskowitz and Gofman 2007; Gofman et al. 2010; Moskowitz et al. 2012; Porretta et al. 2019).

The research context begins with the design of a 4x4 experiment, which involves four study subjects or pillars and four answers that encompass the entire range of potential responses for each pillar. These answers aim to provide a deep understanding of the subject matter, rather than simply being haphazardly compiled (Todri et al. 2020).

The following (see Table 2) are the four pillars of this study: **What is your opinion on purchasing voluntary insurance? What types of voluntary insurance options do you currently utilize? Which voluntary insurance policies related to agriculture and livestock are most preferred? Is investing in pension funds considered interesting?**

Relevant research on the existing literature was undertaken to understand and define the study's pillars. An online survey was distributed to regional colleagues to gather their perspectives and assist in facilitating the survey administration process.

An algorithm was utilized to merge responses into concise vignettes comprising 2, 3, or 4 answers, ensuring no more than one answer from each pillar was included. These vignettes were then presented to respondents for evaluation using a Likert scale ranging from 1 to 9 as it offers a wide range of meaningful evaluations to assess respondents' attitudes, opinions, or perceptions regarding the research topic. Our Likert scale is structured as follows: 1. Strongly Disagree, 2. Disagree, 3. Somewhat Disagree, 4. Neutral, 5. Somewhat Agree, 6. Agree, 7. Strongly Agree, 8. Very Strongly Agree, 9. Extremely Agree. Further, the respondents 'data are transformed using the equation relating the presence/absence of the 16 research elements rating, which is expressed as Transformed Rating = k0 + k1(A1) + k2(A2) .. + k16(D4), where the independent variables A1-D4 contain the 16 answers. The response transformation process via Mind Genomics technology is performed through complex statistical regression models considering that each respondent evaluates 24 different contexts of the research topic.

In this research study, the results are distributed according to gender, age group, and parameters proposed at the beginning of the study.

Table 2. Mind Genomics experiment pillars

Question 1 – What do you think about buying voluntary insurance?	
A1	I have no information regarding voluntary insurance
A2	I do not see necessary buying voluntary insurance
A3	I have information regarding voluntary insurance
A4	I agree to invest in voluntary insurance
Question 2 – What kind of voluntary insurance options do you use?	
B1	I do not use any kind of voluntary insurance option
B2	I mainly use voluntary motor vehicle liability insurances
B3	I usually use voluntary policies related to health insurance and life
B4	I usually use voluntary policies related to property and accidents
Question 3 – Which voluntary insurance policies related to agriculture and livestock are the most preferred?	
C1	Voluntary insurance policies related to agriculture and livestock are inexistent.
C2	The most preferred voluntary insurance policies are related to agricultural tools and machineries
C3	The most preferred voluntary insurance policies are related to livestock and crops
C4	The most preferred voluntary insurance policies are related to greenhouses and organic farming
Question 4 – Is it interesting to invest in pension funds?	
D1	Investing in pension funds is not interesting as the contribution to it is subject of taxes
D2	Investing in pension plans is interesting as it allows for planning additional income for retirement
D3	Investing in pensions is of interest only for people with higher income
D4	Investing in pension plan is interesting if it is financed by employers

Source: Mind Genomics experiment pillars

4. Results and discussions

Only 70.7% of professionals contacted by e-mail completed the questionnaire.

According to these data, 37.5% of the elements evaluated in this questionnaire were rated 4 (participants agree with AI use in the financial services industry), and the rest of 62.5% were rated 3 (participants are undecided about AI use in the financial services industry; see Table 3).

Mind Genomics offers a coefficient known as an intercept or additive constant. This coefficient represents the level of optimism regarding the experiment's success in the absence of any other information. The findings indicate that 26% of interviewees from the Western Balkans are receptive to voluntary insurance. Additionally, this coefficient is 31% for females compared to 22% for males, suggesting that females are more inclined towards using voluntary insurance products.

In general, the interviewees of both genders belonging to the group from 18 to 65+ have the following evaluation of the pillars of the experiment: the voluntary insurance products related to agriculture and livestock are the most preferred (1.75); the interest to invest in pension funds (1.75); the use of voluntary insurance options (1.5); thinking about buying voluntary insurance (0.25).

Referring to the first pillar, the data show that preferences for voluntary insurance are predominantly related to crops and livestock (valued at 4). Mainly the interviewees' group ages state that they prefer voluntary insurance products related to livestock and crops (C3); they evaluate this item on average at 4. The only interviewees' that have a contrary opinion are those of 25-34 group age (they value this item at -1). Females and males have the same opinion regarding this aspect; females evaluate this item at 5 while males at 4.

Interviewees evaluate at 2 the option the most preferred voluntary insurance policies are related to agricultural tools and machinery (C2). All interviewees, regardless of their age, regarding voluntary insurance prefer products related to agricultural tools and machinery; they evaluate this option on average at 1.66. Females and males share the same opinion regarding this option; females evaluate it at 3 while males at 2.

The study results show that there are interviewees considering inexistant voluntary insurance policies related to livestock and agriculture (C1); they have evaluated this option at 1. The same opinion is shared by group ages 18-24 and those of 35-44; they evaluate this option respectively at 5 and 6. Group ages 25-34 and 45+ do not share the same opinion; they evaluate the same option at -6, -1, -1, and -4, respectively. Males have a favorable opinion on this issue; they evaluate it at 3, while females evaluate it negatively at -1.

Regarding the voluntary insurance products dealing with greenhouses and organic agriculture (C4), both genders have the same indifferent approach and evaluate it at 0.

Furthermore, interviewees consider that the most beneficial aspect of investing in retirement plans is the ability to plan for additional funds (D2) is evaluated at 3. Group ages favoring this opinion are 18-24 and those over 35; they value this item at 2,6,14, and 7, respectively. Meanwhile, group ages 25-34 and over 65 are indifferent as they evaluate it at 0. Females are more favorable to this issue; they evaluate it at 5 while males at 2.

Despite this, interviewees think investing in retirement funds becomes less attractive because it is subject to taxation (D1), this item is evaluated at 2. This opinion is shared by the group ages 45+; they evaluate this item at 6, 7, and 6, respectively. Instead, group ages 18-44 do not consider this issue of any concern; they evaluate this item at -2, -4, and -3, respectively. Females are more attentive to this issue than males; they evaluate this item at 4 while males at 1.

The abovementioned arguments favor the idea that investing in retirement funds primarily benefits people of high income. Thus, the item Investing in pensions is of interest only for people with higher income (D3) is evaluated at 1. However, different groups of interviewees share different opinions regarding this issue. Group ages 18-24, 45-54, and 65+ do not consider that only higher-income people will benefit from investing in private retirement funds; they evaluate this item at -1, -8, and -3, respectively. Meanwhile, group ages 25-44 and 55-64 think the opposite; they evaluate this item at 4, 3, and 1, respectively. Males judge investing in private retirement funds is beneficial only to higher-income people; they evaluate this item at 3. Meanwhile, females share a different opinion; they evaluate this item at -6.

Regarding investing in retirement funds, interviewees think it is an exciting idea if employers finance it; the item Investing in pension plan is interesting if it is financed by employers (D4), is evaluated at 1. Group ages 18-34 and 55-64 years old share the same opinion; they evaluate this item at 3, 7, and 5, respectively. Group ages 35-54 and 65+ do not share this opinion; they evaluate this item at -2, -5, and -3, respectively. Males favor this opinion more; they evaluate it at 2, while females evaluate it at 1.

Referring the issue of voluntary insurance, interviewees consider the most beneficial auto insurance. Thus, the item I mainly use voluntary motor vehicle liability insurances (B2), is evaluated at 3. These products are preferred for group ages 18-24 and 55+; they value it with 15, 9, and 14, respectively. Group ages 25-54 do not share the same opinion; they evaluate it on average at -5. These insurance policies are more preferred by males; they evaluate it at 6 while females at 1.

Part of the interviewees revealed they do not use any voluntary insurance; they evaluated the item I do not use any kind of voluntary insurance option (B1) at 1. Group ages 18-24 and 55+ confirm this conclusion; they evaluate this item at 11, 13, and 6, respectively. Group ages 25-54 do not share the same opinion as they evaluate the same item on average at -8. Males favor this item more than women; males evaluate it at 3 while females at 2.

Interviewees share the opinion that among voluntary-insurance products, they prefer the ones related to health and life. Thus, they evaluate the item I usually use voluntary policies related to health insurance and life (B3) at 1. Group ages 18-24, 35-44, and 55+ use these insurance products; they evaluate it at 6, 2, 1, and 12, respectively. Group ages 25-34 and 45-54 do not appreciate these insurance products; they evaluate this item at -13 and -5, respectively. Males prefer these products and evaluate them at 5, while women do not; their evaluation is -4.

Regarding property-insurance products and those related to accident insurance, both genders are indifferent; they evaluate the item I usually use voluntary policies related to property and accidents (B4) at 0.

The study shows that the least appreciated element is the lack of knowing more about insurance products. Thus, the item I have no information regarding voluntary insurance (A1) is evaluated at -1. Group ages 25-54 and 65+ think information about voluntary insurance products is abundant; they evaluate this item at -12, -1, -3, and -7, respectively. The opposite opinion is shared by group ages 18-24, 55-64; they evaluate this item at 3, and 18, respectively. Males seem to be less informed regarding voluntary-insurance products as they evaluate this item at 4; meanwhile, females evaluate it at -1.

Based on these remarks, interviewees do not consider it necessary to buy voluntary insurance; thus, the item I do not see as necessary for buying voluntary insurance (A2) is evaluated at 2. This opinion is shared by group ages 35-44 and 55+; they evaluate it at 9, 11, and 4, respectively. Group ages 18-24, 25-34, and 45-54 do not share the same opinion; they evaluate this item at -4, -6, and -4, respectively. Females are more reluctant to buy these products; they evaluate it at 3 while males at 2.

In general, interviewees share the opinion that they are knowledgeable about voluntary insurance products. Thus, they evaluate the item I have information regarding voluntary insurance (A3) at 1. Interviewees of all group ages and regardless of gender, believe they are knowledgeable about voluntary insurance products; on average, they evaluate this item at 1.

Meanwhile, some interviewees do not agree to buy voluntary insurance products; they evaluate the item I agree to invest in voluntary insurance (A4) at -1. Group ages 18-34 and 45+ share the same opinion; they evaluate this item on average at -5. Meanwhile, group ages 35-44 are comfortable investing in similar products; they evaluate this item at 4. Females favor investing in such products; they evaluate this item at 4, while males have a different opinion as they evaluate it at -1.

5. Conclusions

This paper provides an analytical overview of the attitudes towards voluntary insurance products in the Western Balkans countries, as investigated through an online experiment called Mind Genomics. Further, the study explores the preferences of citizens in the Western Balkans regarding various voluntary insurance products, considering age and gender. This study indicates that voluntary insurance products are more favored by women (with a base coefficient of 31%) than men (with a base coefficient of 22%) in the Western Balkan region. Furthermore, individuals aged 25-34, 45-54, and those over 65 years old exhibit the highest

demand for voluntary insurance products, with coefficient values estimated at 43, 38 and 34 respectively.

Four category of people are distinguished in the study based on how they behave regarding insurance. The first category, with a rating of 1.46, includes individuals who see voluntary insurance as a means of financial security, thereby making their decision to purchase voluntary insurance significant. They mainly opt for voluntary motor vehicle liability insurance and prefer policies related to agricultural tools and machinery, livestock, and crops. This mentality is common among males and females of 35-44 years old.

The second category, valued at 1.5, pertains to individuals who consider experience and circumstances crucial in voluntary insurance. They mainly use voluntary motor vehicle liability insurances and policies related to property and accidents. Their most preferred policies are those related to greenhouses and organic farming. They do not find investing in pension funds interesting due to tax implications and believe it is only relevant for people with higher income. However, they express interest in employer-financed pension plans. Individuals with this mindset, are males and females over 55 years old.

The third category, evaluated at 0.42, encompasses individuals who view voluntary insurance as a matter of mentality; they prefer insurance policies related to livestock and crops. This category is predominantly observed among females aged between 45-54 years old.

The fourth category, rated at 1.13, is attributed to individuals who believe that the COVID-19 pandemic has influenced decisions regarding voluntary insurance. Due to lack of detailed information on the subject, they mainly utilize voluntary motor vehicle liability insurances along with health and life insurances. Their most preferred policies are those related to agricultural tools and machinery as well as livestock and crops. This category includes males and females under the age of 34.

Additional findings from this study, regardless of age group, gender, or study parameters reveal that the primary issues identified through interviews are as follows: C3. Livestock and crop-related voluntary insurance policies are the most favored options (4); C2. Agricultural tools and machinery-related voluntary insurance policies are also highly preferred (2); B2. Voluntary motor vehicle liability insurances rank as the top choice among voluntary products (3); D2. Investing in pension plans is deemed interesting due to its ability to provide additional income during retirement (3); D1. However, investing in pension funds is considered unattractive because contributions to it are subject to taxes (2); A2. Some individuals do not perceive purchasing voluntary insurance as necessary (2).

The first two findings, regardless of the age of the interviewees' group, confirm that the primary needs of Western Balkan countries regarding voluntary insurance products are focused on the agriculture sector. This sector is crucial for their developing economies. Consequently, in order to support agriculture and livestock and establish a sustainable business strategy, insurance companies should pay attention to these customer preferences as well as their buying motives. It is important to offer more affordable voluntary insurance products suitable in terms of price to businesses operating in Western Balkan countries that are exposed to climate-related risks. At the same time, there is an increasing need for education among farmers and entrepreneurs on this matter since these products can be complex.

The third finding reveals that among younger (18-24) and older (over 55) age groups, voluntary motor vehicle liability insurance remains the most preferred non-life insurance product. Individuals in these ages use this type of insurance as a fundamental risk transfer tool, as well as an obligation stemming from financial contracts with banks and other financial institutions.

In light of this, it is important to emphasize those debtor customers and non-debtor customers should be offered customized voluntary insurance policies. These policies are not required to be the same for both groups. Moreover, when calculating the risk premium for motor vehicle liability insurances, it is crucial to consider the accident rate.

Moreover, with a strong focus on securing their future, citizens of the Western Balkans believe that investing in the pension fund is attractive regardless of their age. However, individuals aged 18-44 express concern over the fact that expenses related to pensions are not tax-deductible. To address this issue, it is crucial to implement an effective pension reform in

collaboration with fiscal reforms. Additionally, exploring a comprehensive tax-deduction mechanism to offset premium costs and other insurance expenses can not only incentivize potential buyers but also foster growth in the insurance market.

The last, but not least important, point to consider is that interviewees, specifically those within certain age groups such as 18-34 and 45-54 years old, believe that purchasing voluntary insurance products is unnecessary. One possible explanation for the lack of interest in buying insurance could be a severe lack of trust in the insurance industry. In the case of healthcare insurance, the historical context of the Western Balkan countries, which were part of the communist bloc, plays a significant role. In these countries, healthcare was offered for free, and this tradition still persists in most of them. However, when consumers remain skeptical about insurance products and services, it becomes challenging to foster market development.

Thus, it is suggested that the need for insurance education may be connected to various factors, including the customers' and employees' lack of knowledge in the insurance sector and the requirement for a more proactive marketing campaign regarding financial awareness. By providing adequate education, individuals can become more informed and discerning, leading to a healthier competitive environment. Consequently, there should be a focus on offering distinctive voluntary insurance products at reasonable prices to cater to different age groups and professions.

Furthermore, the legal, regulatory, and institutional framework pertaining to insurance in the Western Balkans needs to be revised simultaneously with the aim of providing a substantial boost to the business climate. Specifically, to foster sustainable market growth, it is crucial to prioritize the adoption of technology and digital marketing strategies. This approach intends to enhance efficiency and decrease costs while also exploring collaboration opportunities between banks and insurance companies. Such synergies will better cater to customer needs and promote overall efficiency within the insurance industry.

This study has a limited scope as it only considers the gender and age of the interviewees, without evaluating other factors such as level of education, profession, and citizenship. Follow-up research can take these factors into account in the second round of study results.

Meanwhile future research may also focus on investigating the psychological landscape involved in the expansion of insurance offerings to include products such as area yield index insurance, multi-peril crop insurance (MPCI), business interruption insurance, environmental impairment liability insurance, micro-insurance, parametric insurance, and political risk insurance. These offerings promise opportunities for the development of the insurance and financial markets in the Western Balkans.

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Announcements, Conferences, News

1st International Scientific Conference on Sustainable Regional Development
"Demographic Transition in 2050 and Regional Policies"
Prishtina, Kosovo, 10-11 Oct 2024

IKSZ
Institute of Scientific Research for Sustainable Development

Event Overview

On 11 October 2024, the 1st Scientific Conference on Sustainable Regional Development was held, at the National University Library of Kosovo "Pjeter Bogdani", Prishtina (Kosovo). The conference was organized by the Institute for Scientific Research on Sustainable Development (IKSZQ) and the University "Haxhi Zeka", Peja (Kosovo), under the aegis of the Ministry of Regional Development of Kosovo. The thematic area of the conference was "Demographic Transition in 2050 and Regional Policies", aiming to explore the challenges and opportunities for sustainable regional development due to demographic change.

The conference opened with a welcome speech by Dr. Filip Ruxho, Assistant Professor and Director of the IKSZQ Institute (Kosovo). Dr. Filip Ruxho stressed the need to consider spatial dimension and spatial variables in Kosovo's regional policies more deeply. In this direction, he underlined, Kosovo needs to draw on all the potential tools provided by current scientific research in Regional Science, such as artificial intelligence, multi-sectoral development, strengthening key sectors of the economy, and utilizing successful models and examples that international experience has to offer. Next, a welcome speech was delivered by Prof. Dr. Armand Krasniqi, Chair of the Conference's Scientific Committee and Rector of "Haxhi Zeka" University, which was a co-organizer of the conference, who commented, among other things, on the importance of education and research in the pursuit of sustainable regional development. Dr. Refike Sulcevsi, Director of the Department of European Integration and Policy Cooperation of the Ministry of Regional Development in Kosovo, among other things, highlighted the importance of cooperation between public and private actors, underlining cooperation as a key driver of progress and sustainable development.

The conference proceedings included a series of lectures by keynote speakers, who highlighted different dimensions of the demographic transition issue toward the future of sustainable regional development. Dr. Tuzin Baycan, Professor of the Department of Urban and Regional Planning, at Istanbul Technical University, and President of the Turkish National Committee of Regional Science (Turkey), highlighted the importance of the digital transition by presenting indicators and related methods for the case study of Turkey. Dr. Dimitrios Tsiotas, Assistant Professor at the Department of Regional and Economic Development, School of Applied Economics and Social Sciences, Agricultural University of Athens (Greece), highlighted the importance of reading the map of inter-regional flows in the European Union and of the emerging challenges through the detection of spatial patterns by presenting an empirical study in the EU.

Dr. Ana VINUELA, Professor at the University of Oviedo (Spain), and Future Executive Director of the Regional Science Association International - RSAI (from Jan 1, 2025), through her online participation, highlighted the importance of social inclusion as a key pillar for harnessing social capital towards sustainable regional development. Dr. Petraq Papajorgji, Professor (Emeritus) at the European University of Tirana, (Albania), highlighted the opportunities emerging through the selective use of AI, presenting an empirical study comparing AI and human-based responses on the same set of inputs. Finally, Dr. Marinela Krstinic Nizic, Prof. and Vice-Dean for Development, Faculty of Tourism and Hospitality Management, Opatija, University of Rijeka (Croatia), pointed out the crucial role of the

comparative advantage of regions with an economic basis in tourism as a factor of sustainable regional development, presenting data from Croatia.

During the conference, a cooperation agreement was signed between the University “Haxhi Zeka”, under its representative, Rector Prof. Dr. Armand Krasniqi, and the University of Rijeka, under its representative Marinela Krstinic Nizic, Vice-Dean for Development, Faculty of Tourism and Hospitality Management, Opatija, University of Rijeka (Croatia). The cooperation agreement aimed at strengthening international relations and cooperation in the field of research and education.

The conference participants expressed their optimism that, through the common goals of addressing demographic challenges and adopting the imperatives of sustainable regional development for a better future, scientific research and politics will find their common ground for convergence. They committed to continue efforts to ensure that their research contributes to the promotion of innovative and sustainable approaches toward a better, equitable, inclusive, and prosperous society. This conference was not only an opportunity to exchange scientific ideas but also an opportunity to forge further partnerships towards the common goal of sustainable regional development.

Event overview edited by Dimitrios Tsiotas,
Assistant Professor, RSI J.

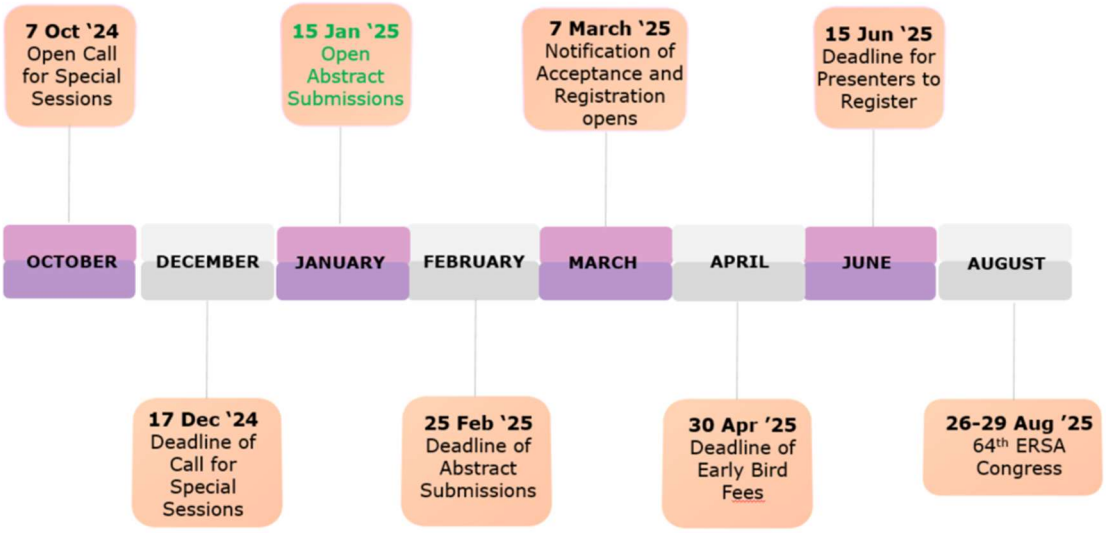
64th ERSA Congress "Regional Science in Turbulent Times. In search of a resilient, sustainable and inclusive future"
26 to 29 August 2025 (onsite participation only).

Event Overview

The 64th ERSA Congress will be held from 26 to 29 August 2025 with onsite participation only. The ERSA2025's edition will focus on "Regional Science in Turbulent Times. In search of a resilient, sustainable and inclusive future". This theme is explicitly related to the contemporary challenges that people and places are facing today and to how Regional Science can reflect and interact with these challenges. The economic crisis, the refugee crisis and the pandemic are some representative examples of the unprecedented intensity and prolonged duration of the sequential crises that have been experienced. The field of Regional Science is made up of a dynamic association of scientists and policy makers who are engaged in understanding, analyzing, and promoting policy proposals that will lead to a more resilient and inclusive future for people and places across the globe.

With approximately 800 participants every year from all continents, the ERSA Congress has become the largest academic conference in regional science worldwide, providing a place to present your research results, get precious feedback and network as well as find out about new developments in the field, and also meet colleagues and friends.

Currently, the Congress is accepting proposals for Special Sessions, with a submission deadline of December 17, 2024. Key dates for subsequent phases of the Congress are outlined in the timetable below:



The Congress Chair, Professor Yannis Psycharis, and the Organizing Committee cordially invite members of the Regional Science community to participate in the 64th ERSA Congress in Athens. This event will bring together diverse perspectives to foster creative and innovative

solutions to regional challenges. Attendees will benefit from a dynamic environment, gaining insights from keynote speakers and colleagues alike, while building connections, sharing experiences, and exchanging ideas.

For more information, please visit: https://ersa.eventsair.com/ersa2025/

Event overview edited by Dimitrios Tsiotas,
Assistant Professor, RSI J.

Academic Profiles

Professor Tüzin BAYCAN, PhD. Professor of Urban and Regional Planning, Istanbul Technical University, Faculty of Architecture, Department of Urban and Regional Planning

Professor Tüzin BAYCAN She obtained her MSc degree in Urban Planning (1993) and PhD degree in Urban and Regional Planning (1999) at Istanbul Technical University. She worked between 1991-2000 as Research Assistant, 2000-2004 as Assistant Professor and 2004-2010 as Associate Professor at Istanbul Technical University. Between 2001-2003 she worked at VU University Amsterdam (visiting scholar) and she continued her project basis works and regular collaboration with the VU University Amsterdam between 2003-2010. She became Full Professor in 2010 at Istanbul Technical University. She worked at George Mason University between 2010 and 2011 (visiting scholar) and at University of Cambridge between 2019-2020 (visiting scholar). Since 2020 she is working at Istanbul Technical University.

Prof. Baycan was the Chair of the EU Center at Istanbul Technical University between 2005-2009 and 2014-2016. She was a Commission Member of the Turkish Council of Higher Education (YOK) for the "Regional Development-Oriented Mission Differentiation and Specialization of Universities Program" between 2016-2021. She has more than 20 years of experience in leading and participating in international (UNDP) and EU Projects (FP5, FP6, FP7), European Cooperation in Science and Technology (COST Action) Program and Erasmus+ Program as well as bilateral joint research projects with various European Institutions. She was also an Expert and Panel Member of ERC Advanced Grants for Social Science and Humanities: Environment and Society (2008-2015) and JPI Urban Europe (2012-2020). She served as external evaluator for different research programs of the EU countries including Austria, Germany, Greece, Hungary, Ireland, Norway, Portugal as well as ESF-European Science Foundation (2010-2024).

Prof. Baycan is Fellow of the Academia Europaea since 2011 with her studies in Social Sciences. She is President of Turkish Regional Science Association and Council Member of Regional Science Association International (RSAI) and European Regional Science Association (ERSA). She has served as Editor and Editorial/Advisory Board Member of Asia and Pacific Journal of Regional Science; Regional Science Policy and Practice; Economic and Social Changes: Facts, Trends, Forecast; Social Value & Intangibles Review; Region; Journal of Independent Studies and Research-Management: Social Sciences and Economics; Romanian Journal of Regional Science; Studies in Regional Science; International Journal of Sustainable Society; A/Z ITU Journal of Faculty of Architecture; Anadolu Economics – Anadolu University Journal of Faculty of Economics; Journal of Design for Resilience in Architecture and Planning; Architecture and Life; ICONARP International Journal of Architecture and Planning; and TRIA International Journal of Urban Planning. She is Co-editor of Resilience, Crisis and Innovation Dynamics (2018); Editor of Knowledge Commercialization and Valorization in Regional Economic Development (2013) and Co-editor of Sustainable City and Creativity: Promoting Creative Urban Initiatives (2011) and Classics in Planning: Urban Planning (2008). Prof. Baycan has contributed to the development of Regional Science and to the fields of urban and regional economic, social and spatial development at national and international level with a wide range of studies she has done from sustainable development to climate change; from migration and migrant entrepreneurship to creativity, innovation and regional development; from urban economy to social innovation. She has over 150 publications, including journal articles, symposium proceedings, book chapters and books.

More about Prof. Baycan: http://akademi.itu.edu.tr/tbaycan
http://www.ae-info.org/ae/Member/Baycan_Tüzin.

Academic Profile by:
Ass. Professor Dr. Filipos RUXHO

Professor Marinela Krstinic Nizic

Vice Dean for Development, Full Professor

Faculty of Tourism and Hospitality Management, Opatija, Croatia

Marinela Krstinić Nižić is a respected expert with a rich career in the field of economics, with a special focus on sustainable development and tourism. As Vice Dean for Development and Full Professor at the Faculty of Tourism and Hospitality Management in Opatija, she contributes to the improvement of education and research in this sector. In her current role as Vice Dean, Marinela is responsible for the strategic development of the Faculty and the implementation of development projects. She is the representative for sustainable development goals at the University of Rijeka. As a full professor, she is involved in teaching national and regional economics, urban economics, energy management in tourism and sustainable development, ensuring that students acquire the knowledge and skills necessary for success in the industry.

Marinela Krstinic Nizic is the author of over 100 scientific papers and actively participates in international scientific conferences. Her research focuses on sustainable development, energy efficiency and economic policy in tourism. As the leader of several scientific research projects such as “Sustainable cities as a driver of economic development” and “Systematic energy management in the hotel industry”. Marinela strives to explore and promote innovative solutions in the economy.

She holds a PhD in Economics from the Faculty of Tourism and Hospitality Management. In addition, she has further qualifications in the field of pedagogical and psychological adult education.

She is known for her exceptional communication and organisational skills and the ability to lead teams and manage projects in a multicultural environment. She was honoured with the Teaching Excellence Award by the University of Rijeka.

Marinela Krstinic Nizic is a member of the Croatian Economic Association and ERSA (European Regional Science Association). She contributes to the community and promotes cooperation between professionals in the field of economics.

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Academic Profile by:
Ass. Professor Dr. Filipos RUXHO

Prof.Dr. Petraq Papajorgji

Prof.Dr. Petraq Papajorgji is a consultant at Moore Albania shpk, Tirana, Albania, independent member of Moore Global Network Limited. His area of expertise is modeling complex information systems. Prof. Papajorgji was for 10 years, editor-in-chief of International Journal of Agricultural and Environmental Information Systems (IJAEIS) indexed in 14 indexes in the web of Science, Associate Editor of Journal of Biomedical Data Mining, Iberoamerican Journal of Applied Computing, Member of Center for Applied Optimization University of Florida, Gainesville, Florida, USA, Honorary Citizen of Berat, Albania. Prof. Papajorgji is member of the group that were awarded the Prize of the Republic, the highest prize in the country, for the study "The Conditions of the Olive Tree in Albania", 1986.

He is author and coauthor of a number of books published by Springer and IGI publishing houses. He has won a number of international awards such Best Paper Award, IGI Publishing, Pennsylvania (USA) in 2012, Certificate for Outstanding Contribution in Reviewing. Journal of Computers and Electronics in Agriculture 2018 and Best Paper Award, 15th International Strategic Management Conference, Poznan, Poland. Prof. Papajorgji has taught a number of courses at several universities around the world. Professor Papajorgji has published more than 100 research papers. Currently, prof. Papajorgji is listed in top 3% of Albanian scientists in Google Scholar.

Academic Profile by:
Ass. Professor Dr. Filipos RUXHO

Associate Professor Ana Vinuela

Ana Viñuela is Doctor in Economics (2011) and Associate Professor at the Department of Applied Economics at the University of Oviedo. She is an active member of the AECR (Asociación Española de Ciencia Regional) and part of the research group on Regional Economics REGIOlab (Regional Economic Analysis Laboratory) founded in 2011, with active presence and research activity in the regional, national and international arena

Recently appointed Executive Director of the Regional Science Association International, RSAI (starting in January 2025), she was visiting professor in REAL (University of Illinois, Urbana-Champaign), the University of Aberystwyth in Wales or the Universitá degli Studi G d´Annuzio Chieti-Pescara in Italy. She was -or has been- involved in several national and European competitive projects dealing with spatial justice, the left behindness concept and its manifestations, and the importance of data science in Human and Social Sciences. At present she is responsible of the quantitative part of the European Project EXIT and is collaborating with local authorities in the field of territorial inequalities and (un)equal opportunities. Member of scientific and editorial committees in many national-international conferences and journals, at present is strongly committed to Regional Science Policy and Practice (RSPP), which is one of the journals of the RSAI. She is the author of more than 20 international scientific articles, several reports for the European Commission related to territorial inequalities and some book chapters published by Thomson or Springer. Her most recent indexed publications are related to the adequacy of using local data to analyze the sources and consequences of territorial inequalities, and include:

Viñuela, A. (2022) “Immigrant´s spatial concentration: Region or locality attractiveness?”, Population, Space and Place, 45 (3): 352-369. Impact Factor SSCI-JCR 2020: 2,477 (Q3 Urban Studies). DOI: https://doi.org/10.1177%2F01600176211056237

Fernández, E., Díaz, A., Rubiera, F., Viñuela, A. (2020) “Spatial disaggregation of social indicators: an info-metrics approach”, Social Indicators Research, 152: 809–821. Impact Factor SSCI-JCR 2020: 1,874 (Q2 Social Sciences). DOI: https://doi.org/10.1007/s11205-020-02455-z

Gutiérrez, D., Rubiera, F., Viñuela, A. (2019) “Determinants of immigrants’ concentration at local level in Spain: why size and position still matter”, Population, Space and Place, 25 (7). Impact Factor SSCI-JCR 2019: 2,591 (Q1 Demography). DOI: https://doi.org/10.1002/psp.2247

Gutiérrez, D., Rubiera, F., Viñuela, A. (2018) “Ageing places in an ageing country: the local dynamics of elderly population in Spain”, Tijdschrift voor economische en sociale geografie – Journal of Economic and Social Geography, 109 (3): 332-349. Impact Factor SSCI-JCR 2018: 1,122 (Q2 Economics). DOI: https://doi.org/10.1111/tesg.12294

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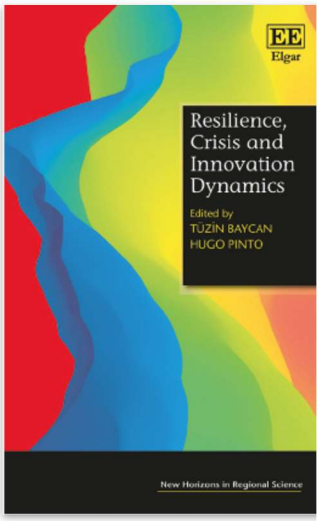
Academic Profile by:
Ass. Professor Dr. Filipos RUXHO

Book Reviews



RESILIENCE, CRISIS AND INNOVATION DYNAMICS, Edited by Tüzin Baycan, Istanbul Technical University, Turkey and Hugo Pinto, Centre for Social Studies, University of Coimbra, Portugal

Resilience has lately emerged as a recurrent notion to explain how territorial socio-economic systems adapt successfully (or not) to negative events. Resilience, Crisis and Innovation Dynamics uses resilience as a bridging notion to connect different types of theoretical and empirical approaches, helping improve understanding of the impacts of economic turbulence at both system and actor levels.

Providing a unique overview of the recent financial crisis, as well as assessing the importance of innovation dynamics for regional resilience, the international array of contributors offers an engaging and thought-provoking debate as to how regional resilience can be improved as well as exploring the social aspects of vulnerability, resilience and innovation. In offering a set of challenges from different regional and structural perspectives, the book helps to consolidate the research surrounding resilience in regional science. Essentially, the contributions consider the relevance of innovation systems, knowledge networks and the role innovation actors play to create new possibilities for preparing for, and adapting to, both present shocks and future problems that may arise.

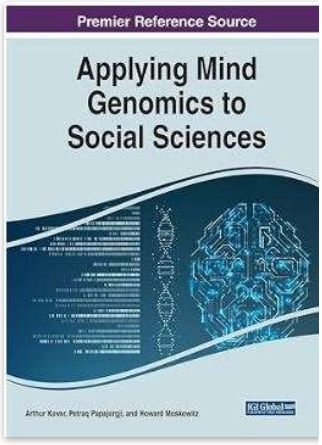
Offering a wealth of refreshing studies with great value for academia, industry and government, this book will be relevant for students and researchers of economics, urban and regional studies, and innovation as well as regional scientists and planners.

“Resilience, Crisis and Innovation Dynamics is a timely and welcome contribution to the debate on economic resilience. The volume takes a fresh look at the topic with a special focus on economic turbulence and vulnerability of regional economies. It brings together a remarkable collection of conceptual and empirical contributions from Europe and beyond, addressing many different dimensions of economic resilience. It is essential reading for practitioners, policy-makers, scholars and students as they seek to understand the ability of regional economies to navigate these turbulent times.” - Elvira UYARRA, University of Manchester, UK

“This book, authored by recognised and young authors from thirteen countries across all continents, shows that globalisation raises similar issues for people and places around the world. It fulfils an important role in the production and sharing of scientific knowledge whilst reinforcing the vocation of regional science to respond to emerging issues in the real world.” - Tomaz Ponce DENTINHO, Editor of Regional Science Policy and Practice

Contributors include: P. Bary, T. Baycan, M.B. Baypinar, M. Benke, A.B.S. Bravo, R. Comunian, P. Cooke, K. Czimre, A.S. Dogruel, F. Dogruel, L. England, A. Faggian, M.E. Ferreira, K.R. Forray, T. Heinonen, D. Kallioras, T. Kozma, B. Martini, S. Marton, F.J. Ortega-Colomer, B.S. Ozen, Y. Ozerkek, P. Pantazis, E. Pekkola, T.S. Pereira, H. Pinto, Y. Psycharis, M.M. Ridhwan, M. Sipikal, M. Siserova, R.R. Stough, V. Szitasiova, K. Teperics, B.J. Valencia

Book Review by
Ass. Professor Dr. Filipos RUXHO



Kover, Papajorgji, and Moskowitz's book "Applying Mind Genomics to Social Sciences" is a new addition to a series of books using quantitative approaches to understand and explain political and social phenomena

Mind genomics is a new technology representing the next level of apprehension of human behavior. It seeks to comprehend what drives consumers and people in their daily decision-making. It offers solutions where surveys and focus groups are inadequate tools to help us better understand how people feel and how they will behave in a particular situation. Mind genomics also seeks to simultaneously understand emotional and rational drivers in social behavior, what motivates people and what does not, and how to react to stimuli in a given situation.

Previous separate studies by the authors P. Papajorgji, A. Kover, and H. Moskowitz have already contributed a great deal to our understanding of this new epistemology and methodology. This understanding has practical implications that are relevant to a wide range of fields, from the food industry to legal services. The present book, while giving an overview of those findings, pushes the boundaries further by opening new avenues of mind genomics in social and political sciences, demonstrating its relevance and applicability in various fields.

Mind Genomics sides with the hypotheses-free paradigm and seeks to offer a better and more dynamic study of the independent-dependent variable relationship. Its experimental design allows us to relate the presence and absence of the different elements, while the findings tend to quantify the individual and collective experiences. Therefore, while allowing for a more encapsulating method that works well with big data, it offers a more nuanced view of the complex societal and political reality. Furthermore, it helps companies to be more successful and competitive by sharpening their innovation edge.

Among many empirical studies that the actual book offers, particularly of interest is the focus on elements such as the decline of America, particularly under the presidency of Donald Trump (2017-2021), which it seeks to dissect, analyze, and comprehend in order to understand voters' reactions, supporters' mobilization, as well as the waves of antipathy or anger that were present at a broad swath of territory and belonged to large segments of the population. Or, for that matter, understanding the storming of the United States Capitol in January 2021. On the other hand, it offers prescient insights into who runs America and how different classes, ethnicities, ages, or income clusters perceive that. Overall, the book offers a combination of rich data with a new methodological approach and fresh analytical insights, which helps us better grasp and understand the complex reality of American society at present and trends toward the new future.

Researchers and academics in various disciplines will find this book invaluable. It significantly contributes to the academic community and offers much-needed value to the ongoing research in the multidisciplinary field of mind genomics. The book's potential to enhance university libraries and contribute to ongoing research underscores its academic value. Doctorate and post-doctoral candidates who are genuinely interested in this developing topic may also find the manuscript to be very helpful. Developing mind genomics in the social and political sciences also broadens the body of knowledge already available and creates new research directions.

Finally, because of its synthetic approach, analytical methods, and complex data analysis, it has potential significance for the business and corporate sectors

Book Review by
Ass. Professor Dr. Filipos RUXHO

GUIDELINES

for the Writers & a format model for the articles submitted to be reviewed & published in the journal

Regional Science Inquiry Journal

(EconLit, Scopus, RSA I) – www.rsijournal.eu

Guidelines for the Writers & a format model for the articles submitted to be reviewed & published in the journal

The Title of the paper must be centered, and the font must be Times New Roman, size 12, in Uppercase, in Bold

For the writers' personal information use the Times New Roman font, size 11, in bold, and centered. Use lowercase for the first name and uppercase for the last name. The line below the name includes the professional title and workplace; use the Times New Roman font, size 10, centered. In the third line write only the contact e-mail address in Times New Roman 10, centered.

Name LAST NAME
Professional Title, Workplace
E-mail Address

Name LAST NAME
Professional Title, Workplace
E-mail Address

Abstract

The abstract consists of a single paragraph, no longer than 250 words. The font must be Times New Roman, size 11. The text must be justified. The title "Abstract" must be aligned left, in Times New Roman, size 11, in bold. A space of one line must be left between the title and the text of the abstract. The abstract must contain sufficient information, be factual, and include the basic data of the paper.

Keywords: Use 3 to 5 keywords, separated by commas

JEL classification: We kindly request that you classify your paper according to the JEL system, which is used to classify articles, dissertations, books, book reviews, and a variety of other applications. The use of the JEL classification is necessary so that your paper be properly indexed in databases such as EconLit. Select the codes that represent your article and separate them by commas. You can find information on the JEL system here: https://www.aeaweb.org/jel/guide/jel.php

1. Introduction

All articles must begin with an introduction, a section which demarcates the theoretical background and the goals of the paper.

The present document provides the necessary information and formatting guidelines for you to write your article. We recommend that you copy this file to your computer and insert your own text in it, keeping the format that has already been set. All the different parts of the article (title, main text, headers, titles, etc.) have already been set, as in the present document-model. The main text must be written in regular Times New Roman font, size 11, justified, with a 0.5 cm indent for the first line of each paragraph.

We recommend that you save this document to your computer as a Word document model. Therefore, it will be easy for you to have your article in the correct format and ready to be submitted. **The only form in which the file will be accepted is MS Word 2003**. If you have a later version of Microsoft Office / Word, you can edit it as follows:

- Once you have finished formatting your text, create a pdf file, and then save your file as a Word "97-2003" (.doc) file.

- Compare the two files – the pdf one and the Word "97-2003" (.doc) one.
- If you do not note any significant differences between the two, then – and only then – you can submit your article to us, **sending both the pdf and the Word "97-2003" (.doc) files** to our e-mail address.

If you use a word processor other than Microsoft Word, we recommend that you follow the same procedure as above, creating a pdf file and using the appropriate add-on in order to save your document in MS Word "97-2003" (.doc) form. Once you compare the two files (and find no significant differences), send us both.

2. General Guidelines on Paper Formatting

2.1. Body

The body of the text consists of different sections which describe the content of the article (for example: Method, Findings, Analysis, Discussion, etc.). You can use up to three levels of sections – sub-sections. For the Body of the text, use the default format style in Word, selecting the Times New Roman font, size 11, justified, with a 0.5 cm indent for the first line of each paragraph (this is further detailed in the section "Paragraphs").

2.2. References

The references included in the paper must be cited at the end of the text. All references used in the body of the paper must be listed alphabetically (this is further detailed in the section "References").

2.3. Appendices

The section "Appendices" follows the section "References".

3. Page formatting

3.1. Page size

The page size must be A4 (21 x 29,7 cm), and its orientation must be "portrait". This stands for all the pages of the paper. "Landscape" orientation is inadmissible.

3.2. Margins

Top margin: 2,54cm
Bottom margin: 1,5cm
Left and right margins: 3,17cm
Gutter margin: 0cm

3.3. Headers and Footers

Go to "Format" → "Page", and select a 1,25cm margin for the header and a 1,25cm margin for the footer. Do not write inside the headers and footers, and do not insert page numbers.

3.4. Footnotes

The use of footnotes or endnotes is expressly prohibited. In case further explanation is deemed necessary, you must integrate it in the body of the paper.

3.5. Abbreviations and Acronyms

Abbreviations and acronyms must be defined in the abstract, as well as the first time each one is used in the body of the text.

3.6. Section headers

We recommend that you use up to three sections – sub-sections. Select a simple numbering for the sections – sub-sections according to the present model.

3.7. First level header format

For the headers of the main sections use the Times New Roman font, size 11, in bold and underlined, and leave a size 12 spacing before the paragraph and a size 6 spacing after the paragraph. The header must be aligned left. Use a capital letter only for the first letter of the header.

3.8. Second level header format

For second level headers, follow this model. Use the Times New Roman font, size 11, in bold, and leave a size 12 spacing before the paragraph and a size 3 spacing after the paragraph. Select a 0.5 cm indent. The header must be aligned left. Use a capital letter only for the first letter of the header.

3.8.1. Third level header

For third level headers, follow this model. Use the Times New Roman font, size 11, in bold and italics, and leave a size 6 spacing before the paragraph and a size 0 spacing after the paragraph. The header must be aligned left, with a left indent of 1 cm. Use a capital letter only for the first letter of the header.

4. Paragraphs

In every paragraph, use the Times New Roman font, size 11, with single line spacing. We recommend you modify the default (normal) format style in Word and use that in your text. For all paragraphs, the spacings before and after the paragraph must be size 0, and the line spacing single. Use a 0,5cm indent only for the first line of each paragraph. Leave no spacings nor lines between paragraphs.

4.1. Lists

In case you need to present data in the form of a list, use the following format:

- Bullet indent: 1,14cm
- Text:
    - Following tab at: 1,5 cm
    - Indent at: 1,5cm

Use the same format (the above values) if you use numbering for your list.

1. Example of numbered list 1
2. Example of numbered list 1

5. Figures, images, and tables

5.1. Figures and images

Insert your figures and images directly after the part where they are mentioned in the body of text. They must be centered, numbered, and have a short descriptive title.

Figures put together "as they are", using Office tools, are absolutely inadmissible. The figures used must have been exclusively inserted as images in Word, in gif, jpg, or png form (with an analysis of at least 200dpi), and in line with the text. The width of an image must not exceed 14,5cm so that it does not exceed the margins set above.

The images, figures, and tables must be inserted "as they are" in the text, in line with it. **Figures and images which have been inserted in a text box are absolutely inadmissible.**

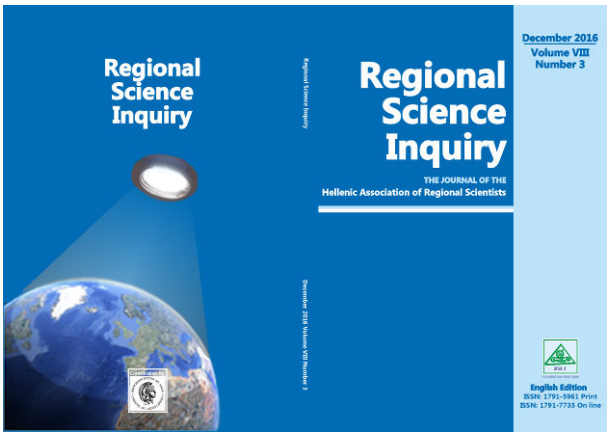
5.1.1. Reference inside the text

Avoid phrases such as "the table above" or the "figure below" when citing figures and images. Use instead "in Table 1", "in Figure 2", etc.

5.1.2. Examples

A model of how to format figures/images follows. For the title, use the Times New Roman font, size 10, in bold. Write the title above the figure, and set a size 6 spacing before the title and a size 0 spacing after it. The line spacing of the title must be 1.5 line. Both the image and its title must be centered.

Image 1: Title



Source: cite the source

Directly below the figure you must cite the source from which you took the image, or any note regarding the figure, written in Times New Roman, size 10. Write it below the figure, leaving a size 0 spacing before and after it, use a line spacing of 1.5 line, and make it centered.

5.2. Tables

For the title, use the Times New Roman font, size 10, in bold. Write the title above the table, and set a size 6 spacing before the title and a size 0 spacing after it. The line spacing of the title must be 1.5 line. Both the table and its title must be centered. The width of the table must not exceed 14,5cm so that it does not exceed the page margins set.

Table 1. Example of how a table must be formatted

Age	Frequency	Percentage %
Under 40	44	32.1
40 - 49	68	49.6
Over 50	25	18.2
Total	**137**	**100.0**

Source: cite the source

If the table needs to continue on the next page, select in the "Table properties" that the first line be repeated as a header in every page, as in the above example of Table 1. **Tables (or figures or images) which are included in pages with a "Landscape" orientation are absolutely inadmissible.**

Every table must have horizontal lines 1 pt. wide at the top and bottom, as shown in the example. The use of vertical lines and color fill at the background of the cells is strictly prohibited.

Directly below the table you must cite the source or any note regarding the table, written in Times New Roman, size 10. Write it below the table, leaving a size 0 spacing before and a size 6 spacing after it, and make it centered.

6. Mathematical formulas

There is a variety of tools in order to insert and process mathematical formulas, such as the "Mathematics", found in the most recent editions of Word, "Math Type", "Fast Math Formula

Editor", "MathCast Equation Editor", "Math Editor". Since it is impossible for us to provide you with compatibility with all these tools in all their editions, **we can only admit your paper if it contains mathematical formulas solely in the form of images.**

Keep a continuous numbering for the mathematical formulas and center them in the page, as shown in the following example:

$$y = ax^2 + bx + c \tag{1}$$

The same stands for formulas or particular mathematical symbols you may have integrated in your text. For instance, if you want to use the term ax^2 in your text, you must insert it as an imaged, in line with the text. The images containing the mathematical formulas must be legible (at least 300dpi).

In the exceptional case of a text which may contain a great number of mathematical formulas, the writer may send it to us in TeX form if they so wish.

7. References

We recommend that you use the Chicago Manual of Style Author-Date system, as it is recommended by the AEA (American Economic Association) for the journals included in the EconLit database, and it is the dominant style of bibliography in the field of Economics. For more information you can go to the following links:

- https://www.aeaweb.org/journals/policies/sample-references
- http://www.chicagomanualofstyle.org/tools_citationguide.html
- http://libguides.williams.edu/citing/chicago-author-date#s-lg-box-12037253

7.1. Online references (internet citations)

Check your links again before sending your file, to confirm that they are active.

Avoid long internet links. Where possible, also cite the title of the website operator-owner. Return the font color to black, and remove the hyperlink. Links such as the following are impractical and distasteful, therefore should be avoided.

Example of an inadmissible hyperlink

https://el.wikipedia.org/wiki/%CE%9F%CE%B9%CE%BA%CE%BF%CE%BD%CE%BF%CE%BC%CE%B9%CE%BA%CE%AC

7.2. References Formatting

For your list of references, use the Times New Roman font, size 10, with single line spacing. The paragraph format must include a size 0 spacing before the paragraph and a size 0 spacing after it, aligned left. Use a 0,5 cm indent only for the first line of each paragraph. Leave no spacings or lines between paragraphs.

7.3. Example of how References must be formatted

Bureau of Labor Statistics. 2000–2010. "Current Employment Statistics: Colorado, Total Nonfarm, Seasonally adjusted - SMS08000000000000001." United States Department of Labor. http://data.bls.gov/cgi- bin/surveymost?sm+08 (accessed February 9, 2011).

Leiss, Amelia. 1999. "Arms Transfers to Developing Countries, 1945–1968." Inter-University Consortium for Political and Social Research, Ann Arbor, MI. ICPSR05404-v1. doi:10.3886/ICPSR05404 (accessed February 8, 2011).

Romer, Christina D., and David H. Romer. 2010. "The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks: Dataset." American Economic Review. http://www.aeaweb.org/articles.php?doi=10.1257/aer.100.3.763 (accessed August 22, 2012).

Ausubel, Lawrence M. 1997. "An Efficient Ascending-Bid Auction for Multiple Objects." University of Maryland Faculty Working Paper 97–06.

Heidhues, Paul, and Botond Kőszegi. 2005. "The Impact of Consumer Loss Aversion on Pricing." Centre for Economic Policy Research Discussion Paper 4849.

Zitzewitz, Eric. 2006. "How Widespread Was Late Trading in Mutual Funds?" http://facultygsb.stanford.edu/zitzewitz.