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Non-Food Geographical Indications in the European Union: Comparative Indicators, Cluster Typologies, and Policy Scenarios Under Regulation (EU) 2023/2411

Giovanni Peira ^{1,*} , Sergio Arnoldi ² and Alessandro Bonadonna ¹ ¹ Department of Management, University of Turin, 10134 Torino, Italy; alessandro.bonadonna@unito.it² Chamber of Commerce of Turin, 10123 Torino, Italy; s.arnoldi@to.camcom.it

* Correspondence: giovanni.peira@unito.it

Abstract

Non-food geographical indications (GIs) are emerging as strategic policy instruments in the European Union after Regulation (EU) 2023/2411 extended protection to craft and industrial products. While the literature on agri-food GIs is extensive, empirical and comparative evidence on non-food GIs remains scarce and fragmented. This study addresses this gap by constructing a harmonised dataset, combining 132 registered and 380 potential non-food GIs identified by EUIPO (512 in total across the EU). Using secondary institutional data, descriptive and comparative statistics, and a hierarchical clustering (Ward, squared Euclidean distance) on normalised indicators total GIs, GIs per million inhabitants (GI/POP), and GIs per € billion of GDP (GI/GDP), the analysis identifies three country typologies differing by scale and intensity. Results reveal a strong geographical concentration in Southern Europe but also unexpectedly high intensity in smaller or mid-sized economies such as Portugal, Cyprus, and Slovenia. A forward-looking scenario analysis based on Cost of Non-Europe (CoNE) estimates suggests that the full implementation of the new Regulation could generate 284,000–338,000 new jobs and € 37–50 billion in additional intra-EU trade. The study contributes to EU policy debates by introducing comparative indicators (GI/POP, GI/GDP) as monitoring tools for evidence-based policymaking and by highlighting the role of non-food GIs as hybrid institutions connecting industrial competitiveness, cultural identity, and sustainability transitions.

Keywords: non-food geographical indications; EU Regulation 2023/2411; craft and industrial heritage; sustainability transitions; regional competitiveness



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1. Introduction

Geographical indications (GIs) are one of the most established forms of intellectual property rights directly linked to place. Initially developed for the agri-food sector, they perform a dual role: signalling origin and quality to consumers, thus reducing information asymmetries, while also protecting producers from name misappropriation and enabling differentiation strategies [1,2]. Unlike trademarks, GIs are collective assets embedded in specific territories, whose reputation and heritage become part of the product's market value [3,4].

In recent years, growing attention has shifted toward non-food GIs, covering crafts, textiles, ceramics, glass, natural stone, wood, and jewellery. This interest stems from two converging forces. On the one hand, there is an increased recognition of the cultural and

heritage value of artisanal products as levers for local development and the preservation of identity [5]. For decades, geographical indications were mainly associated with food and wine. The adoption of Regulation (EU) 2023/2411 has altered this landscape by introducing a unitary system of protection for craft and industrial goods, an achievement considered a milestone in EU institutional design [5]. The reform positions GIs as more than commercial labels; they become instruments of industrial and cultural policy, with immediate implications for sustainability agendas and regional competitiveness [6,7].

The European context offers emblematic cases, such as Murano glass, shaped in Venetian workshops; Limoges porcelain, with its refined tradition; and Alençon lace, long recognised as “the queen of lace”, exemplifying products that embody cultural symbolism as well as economic value [6–8]. Their protection is not merely a commercial device: it ensures the preservation of intangible heritage and offers producers renewed opportunities to compete globally [9,10].

From a policy perspective, the protection of non-food GIs serves two strategic purposes. First, it reduces the costs of fragmentation through harmonised rules and legal certainty, supporting cross-border competitiveness in line with the paradigms of European Added Value (EAV) and the Cost of Non-Europe (CoNE) [11,12]. Second, it aligns with the EU’s broader objectives in the Green Deal and the circular economy, as many artisanal productions rely on durable materials, local resource cycles, and repair-based practices [13].

Several theoretical approaches offer complementary perspectives to understand this phenomenon. Valuable scarce resources are difficult to imitate. In these respects, GIs fit the profile of strategic resources [14,15]. Nevertheless, they only work if institutions, through norms and rules, provide stability and legitimacy [16,17]. What makes them distinctive is their embeddedness: tied to local assets and identities, they resist being reproduced elsewhere [18]. This combination of resources, rules, and place is what gives GIs their distinctiveness. Scholars have shown that such arrangements act as “protective spaces” where alternative production models can evolve. More recently, sustainability research has suggested that they may even function as experimental niches where greener and more resilient production models can take root [19]. In otherwise distinct fields, scholars converge on a shared intuition that GIs can be read in many ways. No single theory fully captures what GIs are. In resource-based terms, they act as collective capabilities; in institutional accounts, they derive strength from rules and norms; in regional development studies, they are inseparable from local resources and identities. Sustainability transitions add yet another angle, seeing them as niches for alternative futures. Read together, these insights reveal GIs as multidimensional institutions linking heritage with competitiveness and sustainability. Despite recent policy and scholarly attention, the study of non-food GIs has not yet reached maturity. To date, no academic contribution has drawn on the new EUIPO dataset, which identifies 132 registered and 380 potentially registrable products, to assess their weight against socio-economic indicators such as population or GDP. Equally absent is the systematic use of comparative measures like GI/population or GI/GDP, widely adopted in the agri-food field [20,21], but not yet tested for craft and industrial products.

In light of these gaps, this study pursues three objectives:

1. to build an integrated dataset combining EUIPO data with Eurostat indicators (population and GDP), thereby offering a harmonised comparative picture;
2. to apply normalised indicators (GI/population, GI/GDP) that highlight relative specialisations and enable fairer cross-country comparisons;
3. to elaborate policy scenarios, translating EPRS estimates into concrete trajectories (business as usual, intermediate adoption, full implementation) and assessing their economic and territorial implications.

Accordingly, the research addresses two guiding questions:

- RQ1: What is the geographical and sectoral distribution of non-food GIs in the EU, and how does it change when using comparative indicators?
- RQ2: Which implementation scenarios of Regulation (EU) 2023/2411 are plausible, and what economic and territorial effects can be expected?

2. Theoretical Framework

2.1. GIs, Territory, and Development

Geographical indications (GIs) are among the most established forms of intellectual-property protection directly tied to place. Developed first in the agri-food sector, they fulfil a dual function. On the demand side, GIs signal origin and quality, reducing information asymmetries and strengthening consumer trust [1,2]. On the supply side, they safeguard producers against the misappropriation of names and enable collective strategies of market differentiation. Unlike trademarks, which are privately owned and transferable, GIs are collective rights embedded in territory. They belong to producer communities and derive value from the geographical, historical, and cultural context in which production takes place [22,23].

This territorial embeddedness is not simply symbolic. It reflects long-term investments of knowledge, tradition, and collective reputation that coalesce into assets difficult to replicate. Scholars have long noted how *terroir*, the intimate link between production and place, creates durable rents that support local resilience [24–26]. Scholars [5] emphasise that GIs function as collective goods, turning place into a productive resource [27] whilst others, through FAO case studies, underline how territorial identity sustains rural development by combining economic, cultural, and ecological functions [28].

In recent years, attention has expanded from food to a wide array of non-food products ceramics, textiles, glass, natural stone, wood, and jewellery that embody both economic value and cultural heritage. Murano glass, still shaped in Venetian furnaces using centuries-old techniques, illustrates how artisanal know-how becomes an intangible asset formalised as a collective right [8,29]. The case of Limoges porcelain shows that even industrial products are inseparable from their territorial origins. Greek woven carpets and Polish linen likewise demonstrate how traditional crafts can preserve local identity as they adapt to international demand [30]. Non-food geographical indications were once a footnote in European IP law with their role confined to signalling provenance [31].

That conception is now obsolete. They operate as policy instruments that safeguard heritage while enabling innovation in product design, production methods and sustainable practice. Regulation (EU) 2023/2411, passed after years of fragmented national regimes, cements this shift by creating a unitary European system for craft and industrial goods [5,32].

This is more than a legal codification. It elevates non-food GIs to the political rank once reserved for agri-food indications and inserts them directly into the debate on industrial strategy and territorially anchored sustainability.

2.2. Regulatory Frameworks and Models

Around the world, the same idea of a name tied to a place is interpreted in very different ways. Europe treats GIs as collective rights. With Regulation (EU) 2023/2411, the Union has created a single procedure for registering and enforcing craft and industrial GIs, requiring common specifications and shared monitoring between producers and national authorities [32,33]. The underlying principle is that protection of a name also protects the cultural and economic ecosystem that sustains it.

The United States moves in another direction. Origin names are handled within trademark law, with certification marks ensuring consumer clarity but offering no territorial entitlement [34,35]. Many other jurisdictions occupy an intermediate space. Latin American

and Asian countries often operate *sui generis* systems inspired by Europe but tailored to development goals such as rural diversification and heritage promotion [36–40]. In Africa, pilot schemes show that government oversight and community participation can work side by side [41]. Australia and Canada have adopted a different strategy, integrating specific safeguards for geographical names within their trademark legislation [42].

Such divergent legal grammars frame the possibilities for mutual recognition and delimit the extent to which protection can expand without impeding market access [43,44]. For European producer clusters, the recent regulation enlarges the competitive arena but simultaneously raises the bar for internal governance.

2.3. Governance of Non-Food GIs

Governance gives life to the legal framework of geographical indications. It determines who makes decisions, how benefits are shared and how conflicts are resolved [4,45]. Evidence from non-food sectors reveals three main patterns.

The first is a state-based model, widespread in Latin America and Asia, where government agencies dominate registration and enforcement [46,47]. Another model is community-based. It appears widely in Europe and allows producer groups to set rules and police compliance, while the state intervenes only at the margins [48,49]. The governance landscape spans a continuum of hybrids, ranging from bottom-up initiatives to full government control, and combining public supervision with local initiative [45,50].

Each pattern carries trade-offs. Centralised arrangements deliver uniformity but can suppress local voices and slow adaptation. Highly decentralised systems favour inclusion but may struggle with enforcement [51,52]. Some studies have shown that, in the presence of weak governance, even highly recognised geographical indication products can lose their ability to maintain their sustainability over time, despite the legal protection they enjoy [25,31,53]. Designing co-governance regimes that balance state authority with producer participation is therefore essential to translating the promise of Regulation (EU) 2023/2411 into lasting territorial outcomes [4,50].

2.4. Three Lenses: RBV, Institutions, and Place-Based Development

The latest EUIPO update lists 132 nationally recognised non-food GIs and about 380 more products in the application pipeline. This expansion, which now ranges from Murano glass to Solingen knives, underscores how certain design traditions continue to draw strength from the places that created them.

It calls for an approach that connects resources, institutional rules and place. Insights from the Resource-Based View, Institutional Theory and the literature on place-based development, while coming from different traditions, converge in highlighting that connection.

The Resource-Based View frames GIs as collective, place-bound assets whose competitive strength depends on their being valuable, rare, hard to copy, and rooted in stable organisational practices [14,15].

Centuries of artisanal knowledge, tacit learning processes, and the symbolic identity of origin give many indications precisely of this combination of attributes. Once legal protection is added, these shared resources become strategic assets capable of sustaining regional competitiveness. Pitelis and Teece extend this reasoning by showing how the cross-border market co-creation and dynamic capabilities enable territories to leverage these resources beyond national boundaries [54]. Empirical work by Menapace and Moschini confirms that GIs can create “reputational rents” by combining collective reputation with private branding strategies, anchoring competitive advantage in place while connecting to global markets [2].

Institutional perspectives underline that the effectiveness of GIs depends on the stability of rules and the legitimacy of governance structures. DiMaggio and Powell describe how organisational fields evolve through coercive, mimetic, and normative pressures, and GIs illustrate these mechanisms well [16]. According to EUIPO records, dozens of non-food GIs are now governed under Regulation (EU) 2023/2411, reflecting a European move toward institutional convergence [55]. It extends this logic by aligning national authorities and producer organisations within a single European regime. But law alone does not secure resilience. As case studies such as Quiñones-Ruiz et al. demonstrate, the staying power of GIs rests on producer groups capable of participatory and adaptive governance [56].

The place-based approach widens the lens, situating GIs within regional development strategies that mobilise unique territorial resources. Classic contributions by Barca, McCann and Rodríguez-Pose argue that development outcomes depend on how local institutions and social capital transform resources into growth [57]. More recent work updates this perspective for the era of the European Green Deal, stressing the need for policies that integrate innovation and tradition [58]. Foray links GIs to the EU's Smart Specialisation agenda, showing how niche productions embedded in local contexts can drive innovation and resilience, particularly in peripheral regions [59]. Camagni and Capello reinforce this argument by framing "territorial capital" as the bundle of material and immaterial assets that underpin regional competitiveness [60]. Andrejević Panić and Cvetanović further elaborate how territorial capital supports differentiated strategies even in small or structurally weak regions [61].

Taken together, these perspectives reveal why GIs matter. GIs function as more than simple labels of origin; they embody collective know-how, institutional arrangements, and territorially rooted capital. When local knowledge is matched with effective governance and smart-specialisation strategies, these indications can convert heritage into a driver of sustainable and inclusive regional development.

2.5. GIs and Sustainability Transitions

The literature on socio-technical change and the circular economy provides a useful lens for understanding how non-food GIs might act as agents of transformation.

Within this field, Geels' multi-level perspective explains systemic shifts as the result of interactions between protected niches, incumbent regimes, and the overarching socio-economic landscape [62]. Subsequent work on sustainability transitions highlights that such niches can serve as incubators of alternative practices capable, over time, of destabilising dominant systems and provoking regime change [63].

Transition studies literature describes "niches" as spaces where alternative practices can mature, and non-food GIs fit this description in several respects. By preserving artisanal skills and reinforcing regional resource cycles, they create conditions that favour the use of durable, repairable materials, a combination that closely reflects the central ideas of the circular economy [10,13].

By codifying production standards and usage rights, the GI legal framework provides an institutional "shield" that enables these low-impact practices to survive global competition and environmental constraints.

Empirical evidence confirms that GI systems can contribute to sustainable development when governance arrangements and collective strategies are well designed. Guareschi et al. show how the GI model supports the achievement of several UN Sustainable Development Goals by linking place-based resources to long-term environmental and social benefits [64]. Falasco et al. provide a systematic review demonstrating that GI governance fosters environmentally responsible production and valorises ecosystem services [65]. FAO further documents how GIs, by embedding resource efficiency and territorial identity,

strengthen rural resilience and promote sustainable food systems, insights that are transferable to craft and industrial GIs [66].

From a policy perspective, these findings connect heritage protection to the European Union's twin transitions toward a green and digital economy. Murano's recent experiments illustrate how shared design knowledge can drive eco-innovation. Collaborative initiatives like "Murano Pixel" involve artisans and companies in recycling and circular production experiments, demonstrating that traditional glassmaking can transition to low-impact practices while maintaining its local identity [67]. Some authors have emphasised that advances in recycled and heat-treated glass provide tangible evidence that sustainable substitutes for conventional materials are technically feasible [68].

These experiences demonstrate how organised local knowledge enables non-food GIs to abandon the routine of standardised mass production and pursue circular economy paths.

2.6. Implications for Comparative Measurement

Building on the previous discussion of non-food GIs as potential drivers of sustainability transitions, robust comparative metrics are needed to monitor where such transformative potential is most concentrated.

A central methodological challenge in GI research concerns how performance is measured. Most cross-country analyses still rely on absolute counts of registered or recognised indications. While intuitive, this practice distorts comparisons by rewarding large economies and penalising smaller ones, thereby masking genuine patterns of territorial specialisation [20,21]. Evidence from agri-food GIs shows that trade and innovation effects can only be properly understood when relative intensity is considered [69].

Normalised indicators such as GIs per capita (GI/pop) or GIs per unit of GDP (GI/GDP) address these distortions by capturing intensity rather than scale. Applied to agri-food products, these metrics reveal that small or medium-sized countries such as Portugal, Cyprus, or Slovenia often outperform larger economies once population or economic size is taken into account [21,27]. Extending this logic to non-food GIs is both novel and necessary. Recent EUIPO data on craft and industrial indications already allow the calculation of such ratios, opening the way for fairer cross-country benchmarking [55].

This comparative approach is not merely technical. By highlighting relative intensity, it can inform EU and national strategies to identify underperforming regions, potential clusters, and opportunities for targeted support [66]. The comparative use of indicators such as population density or GDP per capita is complicated by the fact that both variables are subject not only to cyclical economic fluctuations but also to retrospective statistical revisions, and by the equally significant differences in national implementation practices or product classifications that can introduce hidden biases into cross-country datasets [27].

For this reason, a convincing interpretation requires that purely quantitative measures be combined with institutional and cultural analysis so that the observed numbers can be situated within their socio-economic environment and related to the wider processes of sustainability transition described earlier.

2.7. Research Gaps and Contribution

The adoption of Regulation (EU) 2023/2411 has not eliminated the fragmentation of academic work on non-food GIs, which remains largely confined to legal scholarship and leaves important empirical gaps.

Chief among them is the absence of an integrated dataset: eAmbrosia offers harmonised information for agri-food GIs, but comparable data for craft and industrial indications were, until very recently, dispersed across national registries.

Only the latest EUIPO report provides an EU-wide mapping, and no study has yet combined these data with socio-economic indicators in order to conduct systematic cross-country assessments [55,66].

Second, the limited use of normalised indicators. Most existing research still relies on absolute counts of registered names, overlooking the intensity of protection relative to population or economic size. As shown in the agri-food field, indicators such as GIs per capita (GI/pop) and GIs per GDP (GI/GDP) reveal patterns of specialisation that raw counts conceal [20–22]. To date, these metrics have not been applied to non-food GIs.

Third, the lack of forward-looking analyses. Although the EPRS study estimated potential benefits of harmonisation, academic research has not yet translated these estimates into concrete scenarios for the craft and industrial sector. Linking CoNE/EAV calculations to sector-specific trajectories remains unexplored [12].

This study addresses these gaps by (i) building a harmonised dataset that integrates EUIPO information with Eurostat socio-economic indicators, (ii) applying normalised comparative metrics (GI/pop and GI/GDP) to non-food GIs for the first time, and (iii) developing exploratory policy scenarios business as usual, intermediate adoption, and full implementation that connect institutional estimates with potential territorial and economic outcomes. Methodologically, the study transfers comparative tools from agri-food to non-food GIs; theoretically, it reframes GIs as hybrid institutions situated at the intersection of intellectual property, industrial policy, and sustainable development [70]. These gaps motivate the following research questions.

2.8. Alignment with the Research Questions

The framework outlined above provides the interpretive basis for two guiding research questions.

RQ1. What is the geographical and sectoral distribution of non-food GIs in the EU, and how does it change when using comparative indicators?

This question draws on institutional theory, which emphasises governance capacity and enforcement, and on place-based approaches that highlight the uneven distribution of resources and traditions. Normalised indicators (GI/pop, GI/GDP) allow a fairer lens to capture relative specialisation and bring small but dynamic economies into focus [21,69].

RQ2. Which implementation scenarios of Regulation (EU) 2023/2411 are plausible, and what economic and territorial effects can be expected?

The CoNE and EAV frameworks provide benchmarks for evaluating the economic pay-offs of harmonisation, while theories of sustainability transitions portray GIs as experimental niches capable of incubating greener and more resilient modes of production [62,63]. Despite this, as research on multi-level governance reminds us, the materialisation of these benefits depends on the robustness of enforcement and on the ability of local producer groups to mobilise resources and maintain participation [56], leaving open the critical issue of whether a unified legal regime can translate into measurable socio-economic and cultural gains throughout Europe.

3. Materials and Methods

3.1. Research Design and Objectives

The study follows a multi-step research design integrating quantitative and qualitative approaches to examine the emerging system of non-food geographical indications (GIs) in Europe. The overarching objective is to assess how craft and industrial GIs perform under Regulation (EU) 2023/2411 and to translate this evidence into comparative and policy-relevant insights. The process unfolds in three sequential stages:

1. Collection and harmonisation of secondary institutional datasets (EUIPO, EPRS, Eurostat);
2. Descriptive and comparative statistical analysis to capture geographical and sectoral patterns and relative intensity through normalised indicators (GI/POP, GI/GDP);
3. Scenario analysis converting institutional estimates into plausible policy trajectories (business as usual, intermediate adoption, full implementation).

This concise three-step design avoids repetition of the research questions and theoretical objectives already discussed in Sections 2.7 and 2.8, focusing instead on operational procedures and data transformation. The study adopts an exploratory and policy-oriented perspective consistent with previous comparative research in management and public policy [71–74].

3.2. Secondary Data Analysis (SDA)

Secondary Data Analysis (SDA) provides the empirical backbone of this study. Following best practice in the social sciences [75,76], SDA is structured in three sequential steps that ensure replicability, transparency, and methodological consistency throughout the process.

- (1) Source identification. Authoritative institutional datasets were selected to guarantee reliability and comparability, including EUIPO [55] for non-food GIs, the European Parliamentary Research Service [12] for Cost of Non-Europe benchmarks, and Eurostat for socio-economic indicators such as population and GDP.
- (2) Data extraction and harmonisation. All records were organised into a database covering product type, country of origin, and legal status (registered or potential). Classifications were aligned with EUIPO definitions, and categories such as ceramics, textiles, glass, and stone were standardised for cross-country consistency. To prevent duplication, potential entries were cross-checked against registered titles at the level of each country and product category.
- (3) Validation and quality control. Data were verified through double-entry checks and compared with national registries where available. The Eurostat Quality Assurance Framework (2023) was used as a benchmark to ensure coherence, comparability, and traceability of all data procedures [77].

All data processing was carried out in Microsoft Excel to ensure full traceability and transparency. The harmonised dataset provides the factual basis for the comparative indicators and clustering procedure described in Section 3.4. By combining official institutional sources under a consistent and transparent protocol, this approach guarantees reproducible results and strengthens the reliability of cross-country comparisons in the non-food GI field.

3.3. Documentary Analysis

Documentary analysis complements the quantitative dataset by examining the legal and policy rationales underpinning non-food GIs. Three strands emerge from the key documents: efficiency concerns linked to the costs of regulatory fragmentation, market evidence highlighting economic potential, and cultural or industrial policy objectives. These rationales are articulated in Regulation (EU) 2023/2411, the EUIPO and the EPRS [12,55,78]. The documents were reviewed through a thematic coding of objectives and expected outcomes, allowing the identification of shared assumptions that inform the scenario-building exercise described in Section 3.1.

3.4. Descriptive and Comparative Statistics

The integrated dataset comprises 132 registered and 380 potential non-food GIs (total 512). We compute two normalised indicators to enable fair cross-country comparisons:

GI/POP = Number of GIs/Population (million)

GI/GDP = Number of GIs/GDP (€ billion)

Conventions. All numeric values use the decimal point (e.g., 19.66), consistent with journal style. Eurostat series were converted to GIs per million inhabitants (GI/POP) and GIs per € billion of GDP (GI/GDP) before standardisation. We report GI/POP to two decimals and GI/GDP to three decimals; silhouettes and medians are rounded to two decimals. Thousands separators are omitted.

Registered vs. potential. We define Total as the sum of registered and potential non-food GIs to capture both realised stock and near-term pipeline under Regulation (EU) 2023/2411. Potential entries were de-duplicated against registered titles at the country × product level; specifications and legal status follow EUIPO definitions. As a robustness check, we re-computed indicators and clusters on registered-only counts; the scale–intensity structure and the three-group typology persisted.

These indicators are standard in agri-food GI studies and are extended here to the non-food domain [21,55,69]. Countries are then grouped using hierarchical clustering (Ward’s minimum-variance method, squared Euclidean distance) on the standardised values of Total (=registered + potential), GI/POP, and GI/GDP [79,80].

The Ward method was chosen because it minimises within-cluster variance and maximises between-cluster distance, producing compact and well-separated groups—a desirable property for cross-country typologies using correlated indicators. Squared Euclidean distance amplifies the contrast among high-variance cases, improving interpretability and visual separation in dendrogram and silhouette plots. This approach follows standard practice in comparative regional studies [79–81], and provides clear, reproducible groupings suitable for policy-oriented interpretation.

To keep interpretation aligned with the research questions, clusters are labelled with a scale-first, intensity-second rule: Leaders exhibit the highest scale (Total) provided relative intensity is not low; Marginal countries score low on both; Emerging players comprise the remainder.

The three-group solution achieves an average silhouette $\approx$ of 0.46, indicating acceptable separation for country-level typologies [82,83]. For transparency, Table 1 reports country-level counts (registered, potential, total), both indicators (GI/POP, GI/GDP), and cluster membership.

Table 1. Non-food GIs by country: counts, normalised indicators, and cluster membership.

Country	Registered	Potential	Total	GIs per Million Inhabitants	GIs per € Billion GDP	Cluster
Cyprus	0	19	19	19.66	0.57	Leaders
Austria	0	42	42	4.59	0.09	Emerging players
Portugal	26	6	32	3.01	0.11	Emerging players
Czechia	25	4	29	2.66	0.09	Emerging players
Italy	0	92	92	1.56	0.04	Emerging players
Spain	0	49	49	1.01	0.03	Emerging players
France	22	29	51	0.74	0.02	Emerging players
Germany	2	39	41	0.49	0.01	Emerging players

Table 1. *Cont.*

Country	Registered	Potential	Total	GIs per Million Inhabitants	GIs per € Billion GDP	Cluster
Malta	0	5	5	8.87	0.22	Marginal countries
Luxembourg	0	4	4	5.95	0.05	Marginal countries
Bulgaria	27	7	34	5.28	0.33	Marginal countries
Slovenia	2	6	8	3.77	0.12	Marginal countries
Estonia	0	5	5	3.64	0.13	Marginal countries
Croatia	4	9	13	3.37	0.15	Marginal countries
Slovakia	12	1	13	2.4	0.1	Marginal countries
Latvia	0	4	4	2.14	0.1	Marginal countries
Finland	0	8	8	1.43	0.03	Marginal countries
Hungary	9	1	10	1.04	0.05	Marginal countries
Lithuania	0	3	3	1.04	0.04	Marginal countries
Ireland	0	5	5	0.93	0.01	Marginal countries
Denmark	0	5	5	0.84	0.01	Marginal countries
Greece	0	7	7	0.67	0,03	Marginal countries
Romania	0	11	11	0.58	0.03	Marginal countries
Sweden	0	6	6	0.57	0.01	Marginal countries
Belgium	2	4	6	0.51	0.01	Marginal countries
Netherlands	0	5	5	0.28	0	Marginal countries
Poland	1	4	5	0.14	0.01	Marginal countries

Source: authors' elaboration. Notes: "GIs per million inhabitants" uses Eurostat DEMO_PJAN (2024); "GIs per € billion GDP" uses Eurostat NAMA_10_GDP (2024, current prices, million EUR) (https://ec.europa.eu/eurostat/databrowser/explore/all/all_themes, accessed on 18 September 2025). GI counts combine national registered and potential CIGIs (EUIPO, 2024). Clusters derived via Ward's method (Euclidean) on standardised features (Total, GI/POP, GI/GDP) and labelled using a scale-first, intensity-second rule.

For precedents of EU country typologies in the GI/quality domain and for comparative analyses using normalised indicators in cross-country clustering, see references therein [84,85].

3.5. Policy Frameworks for Interpretation

The interpretation of findings is anchored in established EU policy frameworks that provide complementary lenses for assessing regulatory performance.

The CoNE and EAV frameworks set out the economic logic of harmonisation and warn of the costs of maintaining fragmented protection [12].

In its 2021 edition, the EU Better Regulation Toolbox added a procedural layer to the debate by promoting evidence-based legislation and cross-sectoral policy coherence [86], a set of guidelines now used in several impact assessments of agricultural and craft GIs.

However, as long noted in multi-level governance studies, the actual effectiveness of any regulation depends on how authority is negotiated and redistributed across municipal, national and European levels a dynamic visible, for instance, in the uneven implementation of the 2023 Regulation [11,87,88].

These empirical and theoretical perspectives jointly inform the evaluation of the three scenarios, allowing economic indicators to be read against the shifting institutional and territorial structures of the Union.

3.6. Limitations

As with any research based on secondary data, limitations must be acknowledged. Results depend on the accuracy and completeness of institutional sources; informal or unregistered traditional products fall outside the scope of analysis. Reliance on EUIPO and EPRS datasets may introduce selection bias, since only officially documented products are considered [12,55].

Methodologically, the present analysis draws strength from its use of secondary data, documentary sources, and statistical clustering, yet these tools remain insufficient for capturing the subtle practices of local communities or the micro-politics of regulatory enforcement.

Addressing these blind spots will require mixed-methods research that integrates large quantitative datasets with fieldwork, combining case studies, semi-structured interviews, and ethnographic observation, to trace how producer groups organise and contest governance in practice [89,90].

Despite such constraints, the triangulated use of statistical modelling, documentary evidence, and scenario analysis provides a robust foundation and constitutes the first EU-wide comparative lens on the nascent regime of non-food GIs.

4. Results

4.1. Descriptive Overview

Table 1 summarises country-level registered, potential, and total non-food GIs together with the two normalised indicators (GI/POP and GI/GDP). Absolute stocks are concentrated: Italy (92), France (51) and Spain (49) account together for 37.5% of all non-food GIs in the EU, and adding Austria (42) and Germany (41) brings the top five to 54% of the total. Greece (EL) is now fully included with 7 non-food GIs, ensuring complete EU-27 coverage and internal consistency across sources.

A different geography emerges when considering relative intensity. For GI/POP (GIs per million inhabitants), the highest values are observed in Cyprus (19.66) and Malta (8.87), with Luxembourg (5.95), Bulgaria (5.28) and Austria (4.59) also among the top performers; Slovenia (3.77), Estonia (3.64), Croatia (3.37), Portugal (3.01) and Czechia (2.66) remain comparatively high. The median is 1.43. For GI/GDP (GIs per € billion of GDP), Cyprus (0.57) and Bulgaria (0.33) lead, followed by Malta (0.22), Croatia (0.15), Estonia (0.13), Slovenia (0.12), Portugal (0.11), Latvia (0.10), Slovakia (0.10) and Czechia (0.09); the median is 0.04. Large incumbents such as Italy (GI/POP 1.56; GI/GDP 0.04), Spain (1.01; 0.03) and France (0.74; 0.01) combine high scale with mid-range intensity, illustrating the scale–intensity trade-off that raw counts alone would mask.

To integrate both dimensions, we apply hierarchical clustering (Ward, Euclidean) on the standardised values of Total, GI/POP and GI/GDP and label the three groups with a scale-first, intensity-second rule. The resulting typology comprises: Leaders (high absolute stocks with non-trivial intensity), Emerging players (strong on at least one dimension, often intensity once normalised, while still building scale), and Marginal countries (consistently low on both). Cluster membership is reported in Table 1; for instance, Cyprus appears among Leaders, whereas Italy, Spain and France, despite their sizeable stocks, are classified as Emerging players because their relative intensity sits around or below the median. Overall, this typology offers a compact, decision-useful reading of the EU landscape that will be used in the subsequent discussion of policy levers.

4.2. Sectoral Distribution

The sectoral breakdown offers new insights into the composition of the emerging non-food GI system and directly contributes to RQ1.

As reported in Table 2, ceramics and textiles dominate the landscape, together accounting for nearly half of all indications (24.2% and 16.0% of the total, respectively). The prominence of mature sectors is sustained by clusters such as Andalusian ceramics, Limoges porcelain, and Central Italy’s textile districts, whose guild-based traditions were formalised long before the creation of EU GI schemes and continue to shape present registration patterns.

Table 2. Sectoral distribution of registered and potential non-food GIs.

Sector	Potential	Registered	Total	%_Total
Other	164	59	223	43.6
Ceramics	110	14	124	24.2
Textiles	49	33	82	16
Stone/Marble	24	19	43	8.4
Glass	18	5	23	4.5
Jewellery/Metals	13	2	15	2.9
Wood	2	0	2	0.4

Source: authors’ elaboration.

While such historical depth offers competitive advantages, it also signals a potential lock-in trajectory in which continued dependence on a few heritage industries could restrict future diversification and the adoption of new technologies.

The residual category labelled “Other”, accounting for 43.6 per cent of all entries, illustrates the wide range of miscellaneous crafts, including paper, leather, and mixed-material products, that remain relatively underexplored but could become important drivers of future registrations once regulatory pathways are clarified.

At the same time, glass, jewellery/metals, and wood stand out as emerging niches. Iconic examples such as Murano glass in Italy or Portuguese silver filigree illustrate how GIs can combine cultural resonance with high international visibility. Although numerically smaller, these categories show promising dynamics, especially when embedded in wider design and fashion ecosystems.

Figure 1 visualises these patterns, highlighting the sharp contrast between sectors with high potential (e.g., ceramics, “other”) and those where registration is already advanced (e.g., textiles and stone/marble). The gap between potential and registered products underscores the importance of targeted policy support to convert latent opportunities into formal GIs.

Evidence from Table 2 and Figure 1 confirms a structural dualism: established clusters safeguard Europe’s artisanal legacy, whereas emerging segments, many still navigating the EUIPO registration process introduced with Regulation 2023/2411, are positioned to spearhead future expansion.

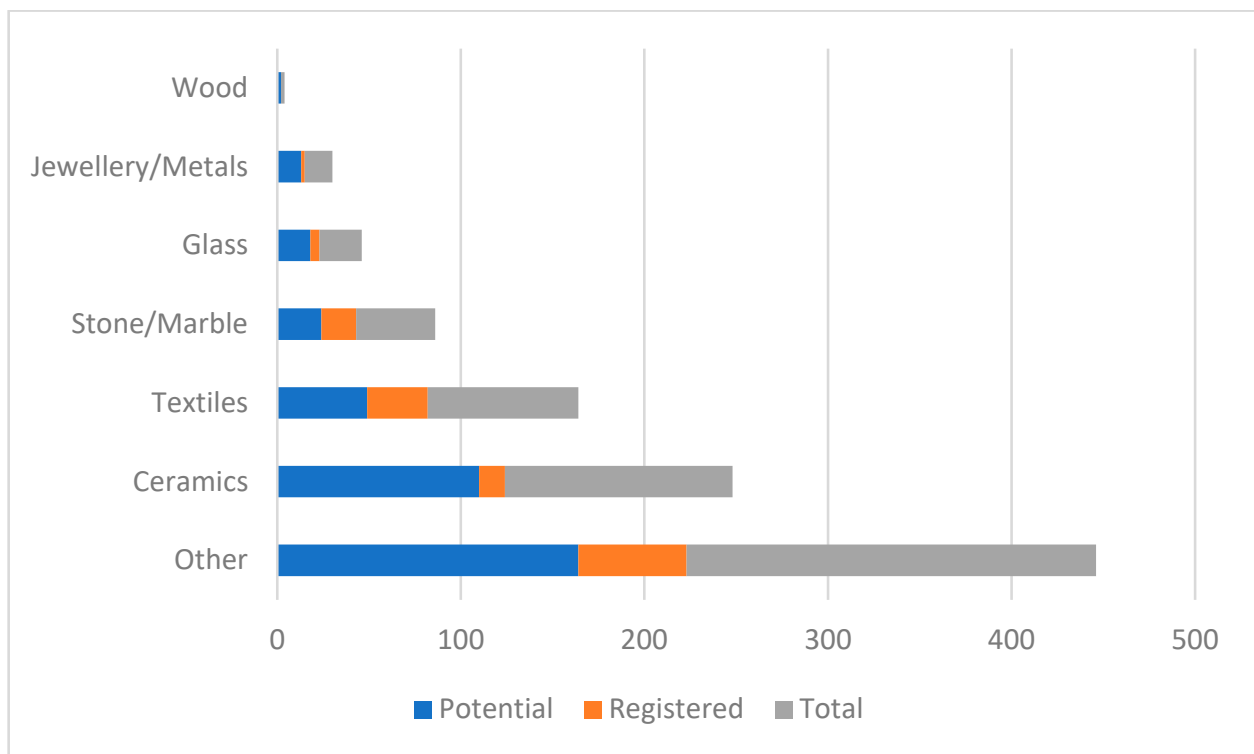


Figure 1. Registered vs. potential non-food GIs by sector (Source: authors' elaboration).

Appreciating this dual trajectory is critical for EU and member-state strategies aimed at diversifying regional value chains and promoting innovation in the wake of the new regulatory regime.

4.3. Comparative Indicators

Normalised indicators reveal a geography that looks quite different from the picture offered by absolute counts, directly addressing RQ1. Table 1 presents the country values, while Figure 2 (GI/POP) and Figure 3 (GI/GDP) illustrate the relative intensity of non-food GIs.

Cyprus leads with 19.66, followed by Malta (8.87), Luxembourg (5.95), Bulgaria (5.28), Austria (4.59), Slovenia (3.77), Estonia (3.64), Croatia (3.37), Portugal (3.01), and Czechia (2.66). The European median is 1.43. Among the larger economies, Italy records 1.56, slightly above the median, while Spain (1.01) and France (0.74) fall below.

A complementary pattern appears when GIs are measured per € billion of GDP (GI/GDP) (Figure 3). Cyprus again tops the list with 0.57, followed by Bulgaria (0.33), Malta (0.22), Croatia (0.15), Estonia (0.13), Slovenia (0.12), Portugal (0.11), Latvia (0.10), Slovakia (0.10), and Czechia (0.09). Here, the median is 0.04. Italy (0.04) aligns closely with this benchmark, Spain (0.03) is somewhat lower, and France (0.02) is further down the ranking.

Taken together, these results reveal a clear scale–intensity trade-off. Large economies dominate when absolute numbers are compared, whereas smaller countries, such as those in Central and Eastern Europe, emerge as leaders once population or economic size is considered. This contrast sets the stage for the cluster analysis discussed in Section 4.4 (decimal points follow standard notation, e.g., 19.66).

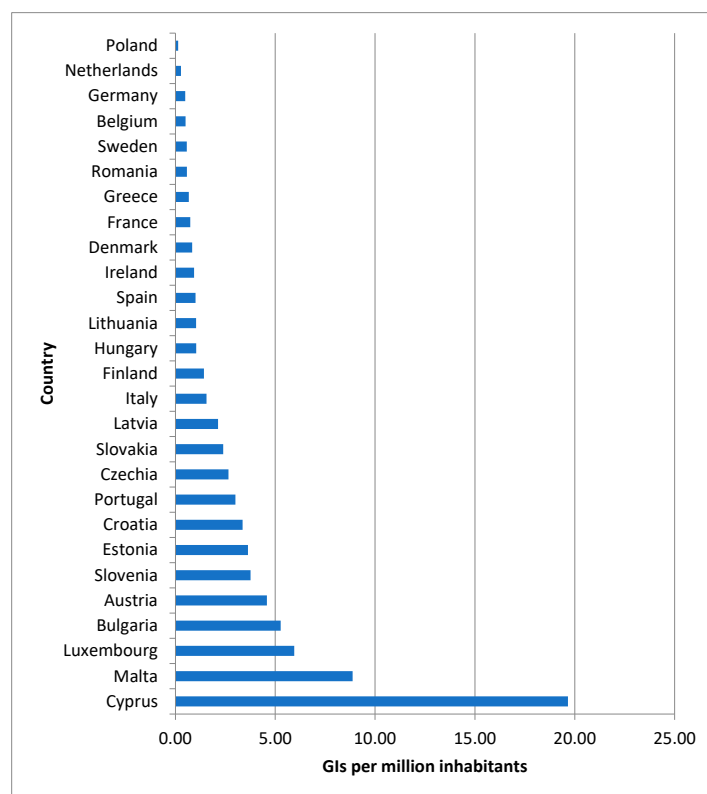


Figure 2. Density of non-food GIs per million inhabitants (GI/POP), EU-27 (2024) (Source: authors' elaboration).

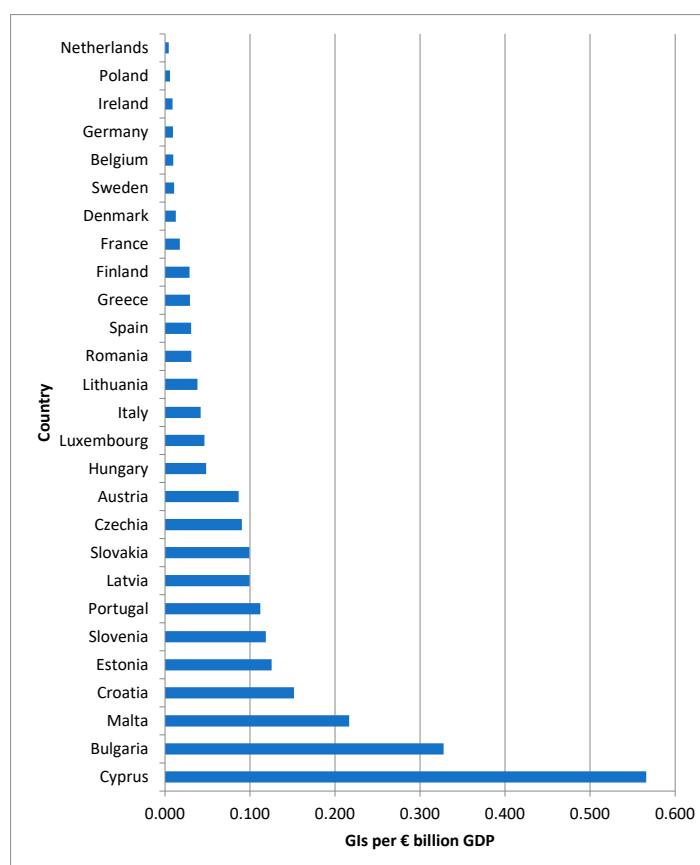


Figure 3. Density of non-food GIs per € billion of GDP (GI/GDP), EU-27 (2024) (Source: authors' elaboration).

4.4. Country Clusters

We group countries using Ward's hierarchical clustering (Euclidean) based on the standardised values of Total (registered + potential), GI/POP, and GI/GDP. The three clusters are labelled with a scale-first, intensity-second rule (Section 3.4). Figure 4 projects the partition onto the GI/POP–GI/GDP plane; dashed lines mark the medians (GI/POP $\approx$ 1.43; GI/GDP $\approx$ 0.04).

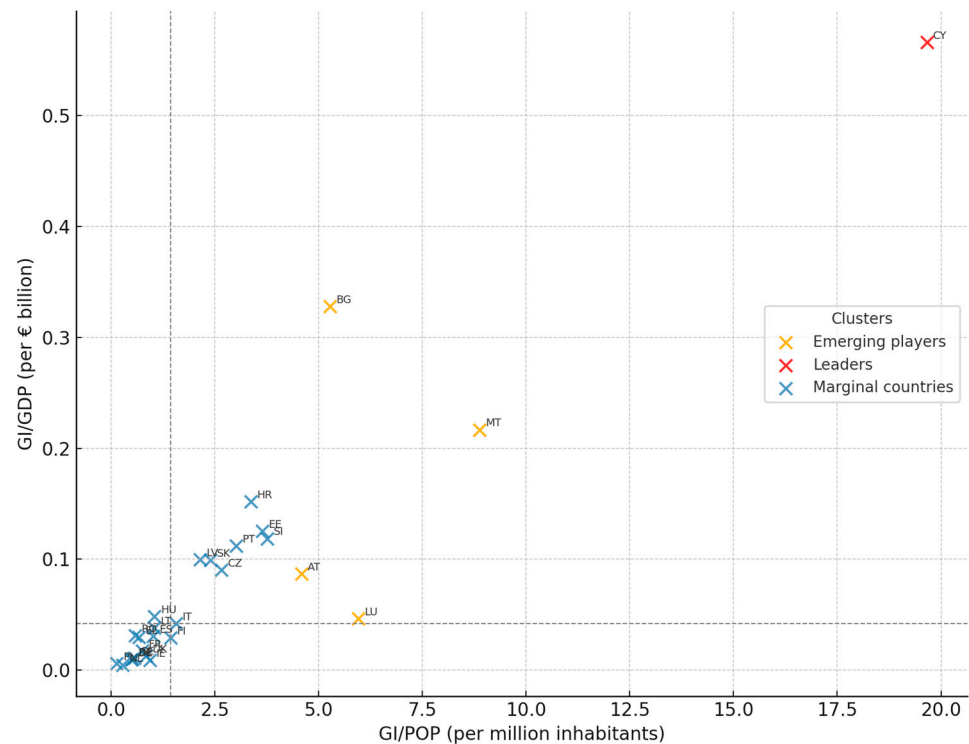


Figure 4. Hierarchical clustering of EU Member States by GI/POP and GI/GDP (Source: authors' elaboration).

Leaders sit in the upper-right corner, combining very high intensity on both axes with at least a non-trivial scale; in this dataset, Cyprus is the clear case (GI/POP $\approx$ 19.7; GI/GDP $\approx$ 0.57).

Emerging players occupy the mid-to-upper band of intensity, typically above one or both medians while still building overall stocks; Austria, Portugal, and Czechia are illustrative cases in our data.

Marginal countries cluster at or below the medians on both indicators; Malta, Luxembourg, Bulgaria and several Northern/Baltic members fall here, despite some posting strong ratios on a single metric.

The resulting typology is stable (global silhouette $\approx$ 0.456) and decision-useful: leaders indicate mature GI ecosystems, emerging reveals activation potential, and marginal points to capacity-building needs.

Overall, the typology is robust (global silhouette $\approx$ 0.46) and decision-useful: leaders signal mature GI ecosystems; emerging players point to activation potential given high intensity; and marginal countries highlight areas where capacity-building and institutional support are most needed.

The three-cluster typology highlights clear differences in both scale and intensity. Beyond these quantitative contrasts, governance structures also vary significantly across groups, as discussed in Section 4.5.

4.5. Governance Patterns Across Clusters

Beyond numerical contrasts, the clustering results also reflect different governance configurations that influence how geographical indications (GIs) are created, registered, and monitored across the EU.

Leaders such as Italy, France, Spain, and Portugal operate under mature and centralised governance systems, where ministries or national agencies coordinate certification, control, and marketing functions. These frameworks are characterised by institutional continuity, clear division of roles between state authorities and producer consortia, and well-developed channels for collective promotion and dispute resolution.

Emerging players including Slovenia, Czech Republic, Cyprus, Croatia, and Greece exhibit hybrid governance models that combine national oversight with regional or sectoral initiatives. In these contexts, intermediate organisations, chambers of commerce, and EU-funded development programmes play an active role in bridging administrative gaps and supporting producers through technical assistance, training, and cluster-based mentoring.

Marginal countries, particularly in the Nordic, Baltic, and parts of Central Europe, reveal fragmented governance architectures and low institutional awareness of GI protection. Registration processes are often driven by local associations or individual enterprises, with limited coordination at the national level.

These qualitative differences help explain variations in cluster intensity and potential for regulatory adoption. Countries endowed with more articulated governance systems tend to mobilise stakeholders more effectively, align administrative procedures with EU standards, and accelerate the conversion of potential into registered GIs.

This finding is consistent with previous evidence on the role of governance capacity, multi-level coordination, and networked institutions in EU quality schemes.

4.6. Integration with Socio-Economic Indicators

Linking GI intensity to macroeconomic size adds an interpretive layer and speaks directly to RQ2. Using data Eurostat population and GDP with our indicators, the association between country size and GI density is non-linear: intensity does not grow mechanically with population or GDP.

Small or medium-sized economies can achieve disproportionately high intensity once size is normalised. As shown in Figures 2 and 3, countries such as Cyprus and Malta (and, among non-micro states, Bulgaria, Austria and Portugal) register top-tier values on GI/POP and/or GI/GDP. These outcomes are consistent with the idea of GIs as place-anchored assets that convert cultural endowments and institutional capacity into competitiveness independently of sheer economic scale.

Conversely, several large economies, for example, Germany and Poland, and to a lesser extent France and Spain, display mid- to low values on GI/POP and GI/GDP despite sizeable total counts. This decoupling between scale and intensity (see the cluster plot in Section 4.4) cautions against using market size as a proxy for GI specialisation.

Taken together, these contrasts lend empirical weight to the place-based rationale of Regulation (EU) 2023/2411: non-food GIs can help smaller or mid-sized economies diversify, retain value locally, and project identity beyond what raw macro indicators would predict. Policy-wise, tracking GI/POP and GI/GDP over time enables targeted support—from capacity-building where intensity is low to consolidation where density already signals strong ecosystems.

4.7. Scenario Analysis

The final step combines the descriptive evidence with a forward-looking assessment of regulatory implementation, addressing the second part of RQ2. We translate the stock of potential non-food GIs into indicative socio-economic effects under three adoption paths, using Cost of Non-Europe (CoNE) and European Added Value (EAV) benchmarks as conversion orders of magnitude. Results are illustrative, not forecasts: they assume proportional conversion of potential into registered GIs, static partial-equilibrium effects (jobs, intra-EU trade), and no displacement, in line with scenario-based approaches adopted in policy evaluation and innovation studies [86,91–93].

4.7.1. Scenarios and Assumptions

To ensure transparency, each scenario is based on a clear set of quantitative assumptions.

- Business as usual (BAU): limited adoption of Regulation (EU) 2023/2411, with about 0–10% of potential titles registered within five years. Effects on jobs and intra-EU trade remain marginal, and country rankings do not change.
- Intermediate adoption: partial implementation, with around 40–50% of potential titles registered, mostly in Member States that already have governance capacity (Emerging players). Estimated effects: +150,000–180,000 jobs and +€18–25 billion of intra-EU trade.
- Full implementation: widespread registration of 80–100% of potential GIs within five years, producing the highest territorial benefits and aligning with previous EPRS estimates (+284,000–338,000 jobs and +€37–50 billion of intra-EU trade).

Underlying coefficients come from the 2019 EPRS Cost of Non-Europe study, applying constant multipliers per registered GI. The approach follows the European Commission's Better Regulation Guidelines [86,92], which recommend using scenario analysis to explore possible policy effects under uncertainty.

4.7.2. Sensitivity and Robustness

To test robustness, alternative conversion rates (30%, 60%, 90%) were simulated.

The results show that impacts increase almost proportionally at lower adoption levels but tend to stabilise beyond 80%, as highly active countries approach saturation. This step follows standard sensitivity-testing practices in EU policy analysis [74,94].

If most new registrations were concentrated among large incumbents, overall gains would decrease by about 10–15%. Conversely, a more balanced geographical uptake could increase job creation by up to 8%. These differences highlight how policy sequencing and institutional capacity can shape the effectiveness of regulation.

4.7.3. Potential Bias and Risk of Overestimation

As with any proportional simulation, these estimates may overstate total benefits if market overlap or administrative delays slow down registrations. Conversely, they may underestimate long-term gains if innovation or cluster effects increase the economic value of new GIs. Similar cautions are reported in EU multi-sector impact assessments [12,74].

For this reason, scenario results should be seen as indicative rather than predictive; they provide an order-of-magnitude view of possible outcomes, not precise forecasts.

4.7.4. Distributional Effects by Cluster

Leaders consolidate their positions as scale advantages persist. Emerging players capture disproportionate gains because normalised intensity (GI/POP, GI/GDP) rises quickly once registrations activate existing pipelines. Marginal countries benefit modestly

unless supported by capacity-building measures such as technical assistance and EU mentoring schemes.

Table 3 summarises these outcomes (registration shares, macro effects, and impact on relative ranking), while Figure 3 visualises the trade-off between regulatory ambition and expected benefits.

Table 3. Socio-economic impacts of alternative implementation scenarios.

Scenario	% of Potential GIs Registered	Jobs (Estimate)	Intra-EU Trade (bn €)	Impact on Relative Ranking
Business as usual	~0%	marginal	marginal	No change
Intermediate adoption	40–50%	+150k–180k	+18–25	Growth of emerging players
Full implementation	100%	+284k–338k	+37–50	New relative leaders

Source: authors' elaboration.

Overall, the scenarios underscore that harmonisation is more than legal codification: it can act as a catalyst for institutional strengthening, regional resilience, and competitiveness across Europe's diverse territories [23,27].

5. Discussion

This paper offers the first EU-wide analysis of non-food geographical indications (GIs) using harmonised institutional data, normalised indicators (GI/POP, GI/GDP), a transparent Ward clustering, and a short scenario analysis. Read together, the results show how craft and industrial GIs function as territorial assets, institutional innovations, and sustainability niches. Four themes run through the findings, territorial development, governance, comparative insights, and sustainability transitions, and directly address RQ1 (geographical/sectoral specialisation) and RQ2 (socio-economic implications of Regulation (EU) 2023/2411) [21,55,69,79,80].

5.1. GIs as Drivers of Territorial Development

Non-food GIs are not just legal labels; they are place-anchored assets with measurable spillovers. Once we move from raw counts to relative intensity GI/POP and GI/GDP smaller or mid-sized Member States come to the fore (e.g., Cyprus, Malta; among non-micro-states Portugal, Austria), while larger economies lose ground when intensity is considered [21,69]. This pattern echoes work showing that GIs can diversify local economies, generate reputational rents, and strengthen social cohesion [51,94]. Our evidence extends that logic beyond food: artisanal and industrial clusters such as Murano glass or Limoges porcelain play roles for regional economies comparable to emblematic agri-food GIs. Policy-wise, GIs act as place-based instruments that reveal locally embedded resources in development strategies otherwise hidden by aggregate statistics [67].

5.2. The Role of Institutions and Governance

The adoption of Regulation (EU) 2023/2411 limits legal fragmentation. Yet a single set of rules cannot guarantee similar results across countries. Studies highlight three conditions that support effective implementation: active involvement of the public, genuine producer representation, and robust collective arrangements [4,95]. Our typology reflects this. Leaders combine very high intensity with at least a non-trivial scale (in our data, Cyprus is emblematic), whereas several large incumbents, Italy, Spain, and France, fall among the Emerging players: substantial scale but mid-range intensity. In short, volume

does not automatically translate into density. Sustained GI performance depends as much on governance and institutional capacity as on product traits [52,70].

5.3. Comparative Insights Beyond Europe

Although our database is EU-focused, international experience helps interpret these patterns. Studies from Latin America and Africa show that GIs strengthen links to terroir and heritage, yet they can raise distributional and access issues within producer groups [31]. Many see geographical indications as a route to sustainable development, yet outcomes vary sharply with institutional strength and local context [96]. Europe can draw a clear lesson. Building a single regulatory framework matters, but it will never guarantee identical results. Success still hinges on governance that fits local realities and on producers who take an active role.

5.4. GIs and Sustainability Transitions

Looking at non-food GIs from a sustainability-transitions angle shows how they protect knowledge networks and local resource flows that strengthen community resilience [13,19]. Their commitment to durable, repairable goods and to locally based resource cycles mirrors the principles of the circular economy and advances the EU's green–digital twin transition. As shown by the scenario analysis in Section 4.6, a full roll-out of the new regulation promises the highest European Added Value. Emerging players stand to capture the largest gains as latent pipelines mature into registrations, Leaders consolidate their positions, and Marginal countries benefit when capacity-building initiatives reduce entry barriers [55]. In short, in the non-food domain GIs tie artisanal and industrial heritage to contemporary sustainability challenges, turning local endowments into competitive advantages.

6. Conclusions

By positioning non-food geographical indications (GIs) at the intersection of intellectual-property policy, territorial development, and sustainability, this study shows both their transformative potential and their uneven diffusion across the EU. Using harmonised institutional sources (EUIPO; Eurostat); normalised indicators GI/POP (per million inhabitants); GI/GDP (per € billion of GDP), achieved using transparent Ward clustering on standardised variables; and a set of exploratory scenarios, we addressed RQ1 on geographical and sectoral patterns and RQ2 on the socio-economic implications of Regulation (EU) 2023/2411.

Empirically, the European system remains concentrated in absolute terms: Southern Member States, most notably Italy, France and Spain, hold the largest overall stocks. Yet the picture changes once size is taken into account. Normalisation by population and GDP reveals high relative intensity in several smaller or mid-sized economies, with Cyprus and Malta leading on GI/POP and Cyprus, alongside Bulgaria, ranking at the top for GI/GDP; Portugal and Austria also perform strongly on at least one of the two metrics. These patterns confirm that GI performance can thrive independently of market size and that intensity uncovers specialisations that raw counts obscure. Sector-wise, non-food GIs gravitate around mature craft industries—ceramics, textiles, and glass—where long-standing know-how and place-based reputation act as contemporary territorial assets.

To integrate scale and intensity, we developed a three-group typology via hierarchical clustering on Total, GI/POP, and GI/GDP, and labelled clusters with a scale-first, intensity-second rule. The solution attains a satisfactory global silhouette of ≈ 0.456 , indicating a stable partition. The typology clarifies why some large incumbents, despite sizeable stocks,

exhibit mid-range intensity, while several smaller economies appear as intensity leaders once size is controlled; in short, volume does not automatically translate into density.

A forward-looking exercise suggests that policy ambition matters. Under fuller implementation of the new regulation, and assuming proportional conversion of potential titles into registrations, order-of-magnitude benefits are plausible, in line with European Added Value benchmarks: roughly 284,000–338,000 additional jobs and €37–50 billion in intra-EU trade. Gains would be uneven: countries with strong intensity but still-developing scale stand to reap disproportionately large improvements as pipelines convert into registered GIs, while intensity leaders consolidate and lower-intensity settings benefit when institutional capacity reduces the fixed costs of first-time adoption.

Conceptually and methodologically, the paper bridges legal–institutional debates with comparative metrics. It transfers established tools from the agri-food literature, normalised indicators, Ward clustering, and scenario building to the non-food domain, offering a replicable framework with clear formulas, open data sources, and transparent labelling choices. Theoretically, it reframes non-food GIs as hybrid institutions: simultaneously legal protections, collective resources, and sustainability niches that can support the EU’s twin green and digital transitions.

These conclusions are subject to limitations. The analysis relies on institutional datasets compiled between 2021 and 2024; this enables EU-wide comparability but leaves micro-processes underexplored, from internal bargaining within producer groups to day-to-day enforcement frictions and the symbolic work of authenticity. The scenario component is illustrative rather than predictive: it assumes proportional conversion of potentials, partial-equilibrium effects (jobs, trade), and no displacement. Results are also sensitive to statistical revisions in population and GDP, to alternative ways of scaling such as per labour force or value added, and to the influence of micro-states on intensity metrics.

These conclusions are subject to limitations. The analysis relies on institutional datasets compiled between 2021 and 2024; this enables EU-wide comparability but leaves micro-processes underexplored, from internal bargaining within producer groups to day-to-day enforcement frictions and the symbolic work of authenticity. The exclusive use of secondary institutional sources may also underrepresent informal or emerging craft traditions that are not yet formalised in official registries. Local and hybrid productions often depend on community networks or cultural associations instead of protected designations, which skews results toward well-established sectors like ceramics and textiles.

Meanwhile, harmonised indicators (GI/POP, GI/GDP) are effective for benchmarking but simplify complex socio-economic settings. Their advantage is transparency, not completeness. The scenario component is illustrative rather than predictive: it assumes the proportional conversion of potentials, partial-equilibrium effects (jobs, trade), and no displacement. Results are also sensitive to statistical revisions in population and GDP, to alternative scale definitions such as per labour force or value added, and to the influence of micro-states on intensity metrics.

These constraints are consistent with the exploratory and policy-oriented design of the research and are typical of cross-country assessments conducted under data-limited conditions. They do not weaken the analytical validity of the findings but rather delineate future research directions, especially the need for field-based and qualitative investigations that capture informal innovation dynamics and emerging craft ecosystems.

Future research should combine macro indicators with fieldwork, using comparative case studies and mixed-methods designs to examine how governance models, community engagement, and enforcement practices condition real-world outcomes. Methodologically, testing alternative normalisations, auditing robustness to outliers, and building panel-type tracking of GI/POP and GI/GDP would refine cross-country comparisons. Interdisci-

plinary work linking industrial policy, cultural governance, and transition studies can further illuminate how GIs operate as living institutions embedded in local communities.

From a policy perspective, legal harmonisation is a starting framework, not an endpoint. A cluster-sensitive approach follows naturally from our findings: contexts with high intensity and non-trivial scale should consolidate and leverage branding and enforcement; settings with strong intensity but limited stocks should activate pipelines through streamlined procedures, technical assistance, and seed funding for GI governance; and lower-intensity environments should build capacity—from national inventories and model specifications to shared legal/quality services and EU-level mentoring. The regular monitoring of GI/POP and GI/GDP, combined with transparent data sources and periodic robustness checks, enables adaptive policy as countries evolve across the typology.

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