



August 2025

D2.2

Analysis of the spatial distribution of the video game industry in Europe



Co-funded by
the European Union



UK Research
and Innovation

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Research Executive Agency. Neither the European Union nor the European Research Executive Agency can be held responsible for them.
Grant Agreement no. 101132585

Project Details

Acronym: **GAME-ER**
 Title: Gaming Clusters Across Multiple European Regions
 Coordinator: **INOVA+ - INNOVATION SERVICES, SA** (Portugal)
 Call: HORIZON-CL2-2023-HERITAGE-01
 Type: HORIZON Research and Innovation Actions
 Topic-ID: HORIZON-CL2-2023-HERITAGE-01-06

 Start: **1 March 2024**
 End: **28 February 2027**
 Duration: **36 months**
 Website: **www.game-er.eu**

Consortium:

No	Participant Name	Short Name	Country
1	INOVA+ - INNOVATION SERVICES, SA	INOVA+	Portugal
2	UNIVERSITA DEGLI STUDI DI TORINO	UNITO	Italy
3	ASSOCIATION POUR LA RECHERCHE ET LE DEVELOPPEMENT DES METHODES ET PROCESSUS INDUSTRIELS	CRG	France
3.1	ECOLE POLYTECHNIQUE	EP	France
4	ASOCIACE CESKYCH HERNICH VYVOJARU ZS	GDACZ	Czechia
5	SPIN SYSTEM	SPIN	Belgium
5.1	NOVARECKON	NR	Italy
6	UNIVERZITA KARLOVA	CUNI	Czechia
7	OGR-CRT - SCPA	OGR-Torino	Italy
8	PLUG AND PLAY PLATFORM SPAIN SL	PNPTC	Spain
9	KLASTER HRVATSKIH PROIZVODACA VIDEOIGARA	CGDA	Croatia
10	GAME ONLY	GO	France
11	HERNÍ KLASTR Z.S.	HK	Czechia
12	MUNICIPIO DO FUNDAO	CMF	Portugal
13	THE UNIVERSITY COURT OF ABERTAY UNIVERSITY	AU	United Kingdom

Disclaimer

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Research Executive Agency. Neither the European Union nor the European Research Executive Agency can be held responsible for them.

Grant Agreement no. **101132585**

© Partners of the GAME-ER Consortium, 2024

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both. Reproduction is authorized provided the source is acknowledged.

Acknowledgements

This deliverable was developed based on collective efforts from all partners of the GAME-ER consortium.

Deliverable Details

Number: **D2.2**

Title: **Analysis of the spatial distribution of the video game industry in Europe**

Lead beneficiary: **UNITO**

Work package: **WP2**

Dissemination level: **Public**

Nature: **Document, report (excluding the periodic and final reports)**

Due date: **31/08/2025**

Submission date: **28/08/2025**

Authors:

Enrico Bertacchini, Department of Economics and Statistics “Cognetti de Martiis”, University of Turin;

Cecilia Maronero, Department of Economics and Statistics “Cognetti de Martiis”, University of Turin;

Pier Paolo Patrucco, Department of Economics and Statistics “Cognetti de Martiis”, University of Turin.

Reviewers:

Stefano De Paoli, AU;

Darshana Jayemanne, AU;

Jose Gomez, AU;

Lynn Love, AU;

Martin Lynagh, AU;

Luís Leça, INOVA;

Mafalda Trigueiro, INOVA.

Version History:

Date	Version No.	Author	Note
16/07/2025	0.1	Darshana Jayemanne, AU	First revision and input provided
18/07/2025	0.2	Enrico Bertacchini, Cecilia Maronero, Pierpaolo Patrucco, UNITO	Integration of inputs and revised version sent for second revision.
25/07/2025	0.3	Jose Gomez, Lynn Love, Martin Lynagh, AU	Second revision and input provided
31/07/2025	0.4	Enrico Bertacchini, Cecilia Maronero, Pierpaolo Patrucco, UNITO	Integration of inputs and revised version sent for third revision.
05/08/2025	0.5	Stefano De Paoli, AU	Third revision and input provided
14/08/2025	1.0	Enrico Bertacchini, Cecilia Maronero, Pierpaolo Patrucco, UNITO	Revised version sent for final revision and submission.
28/08/2025	1.1	Luís Leça, Mafalda Trigueiro, INOVA	Final Revision and Submission

Glossary and Abbreviations

Bureau Van Dijk identification code	BVD ID
Cultural and Creative Industries	CCIs
Communication, Dissemination and Exploitation	CDE
European Commission	EC
European Union	EU
European Games Developer Federation	EGDF
Geographical Information System	GIS
General Data Protection Regulation	GDPR
Herfindahl-Hirschman Index	HHI
Information and Communication Technology	ICT
Large Language Model	LLM
Location Quotient	LQ
Nomenclature statistique des activités économiques dans la Communauté européenne (Statistical Classification of Economic Activities)	NACE
Nomenclature of Territorial Units for Statistics	NUTS
Organisation for Economic Co-operation and Development	OECD
Online Games Daten Bank	OGDB
Standard Industrial Classification	SIC
UN Trade and Development	UNCTAD
United Nations Educational, Scientific and Cultural Organization	UNESCO
Video Game Industry	VGI
Virtual Reality	VR
World Intellectual Property Organization	WIPO
Work Package	WP

Table of Content

1	INTRODUCTION.....	14
1.1	PROJECT OVERVIEW	14
1.2	OBJECTIVES OF THE DELIVERABLE	14
1.3	RESEARCH QUESTIONS AND STRUCTURE OF THE DELIVERABLE	15
1.4	CHALLENGES AND ISSUES IN THE IDENTIFICATION AND MAPPING OF THE VIDEO GAME SECTOR.....	16
1.5	THE GAME-ER DATA-DRIVEN MAPPING STRATEGY.....	18
2	DATA AND METHODOLOGY	20
2.1	DATA SOURCES	20
2.2	DATABASE CONSTRUCTION: A TWO-STEP DATA-DRIVEN APPROACH	24
3	MAPPING THE VIDEO GAME INDUSTRY IN EUROPE	36
3.1	THE EUROPEAN GEO-REFERENCED VIDEO GAME COMPANIES DATABASE: KEY FIGURES.....	36
3.2	INDUSTRIAL CLASSIFICATION OF THE VIDEO GAME INDUSTRY IN EUROPE ..	45
3.3	GEOGRAPHICAL VISUALISATION	50
4	REGIONAL ANALYSIS	63
4.1	DATASET AND DESCRIPTIVE MAPS	63
4.2	IDENTIFICATION OF SPECIALIZED REGIONS	69
5	CONCLUSIONS.....	97
6	REFERENCES.....	99
7	APPENDIX	102
7.1	APPENDIX: TABLES	102
7.1.1	APPENDIX: RETENTION RATES AND ROBUSTNESS.....	102
7.1.2	APPENDIX: TURNOVER AND EMPLOYMENT.....	106
7.1.3	APPENDIX: DATABASE OF EUROPEAN VIDEO GAME COMPANIES: KEY FIGURES.....	107
7.1.4	APPENDIX: NACE CODE DISTRIBUTION.....	109

List of Figures

Figure 1. Database construction overall procedure	24
Figure 2. : Database construction: Identification of videogame companies and their nationality...	25
Figure 3. Results of the first matching - Top European Countries by Number of Video Game Companies	26
Figure 4. Number of companies in selected countries reported by the EGDF in 2020 vs. GAME-ER first-step matching procedure	27
Figure 5. Database Construction - Localization of firms and linkage with business information	28
Figure 6. Distribution of total and active European companies (displayed only top 15 European countries by number of total companies)	29
Figure 7. Video game company employment of active companies in 2020-2024 vs. games, collectors, and credited people (all variables transformed in logarithmic scale)	34
Figure 8. <i>Temporal trend in the number of active videogame companies in selected countries (number of companies in each country in period 2000-04 used as a baseline and set to 1)</i>	40
Figure 9. Top 12 most frequent NACE codes per active video game companies	48
Figure 10. Distribution of NACE codes: Top 3 NACE codes by GAME-ER operational partners as % of total active companies in the 2020-2024 period.....	49
Figure 11. <i>The geography of the video game industry over time (n. of active companies by number of games)</i>	51
Figure 12. Distribution of European video game companies by role (all companies)	52
Figure 13. Number of active developers and publishers	53
Figure 14. Number of active companies (all roles) specialised in Console games	54
Figure 15. Number of active companies (all roles) specialised in Computer games.....	55
Figure 16. Companies specialized in Mobile, IOs, and Other mobile	56
Figure 17. Active companies (across roles) specialized in Mobile, Other mobile and iOS	57
Figure 18. Location of active video game companies across roles in the cities of Barcelona, Hamburg and Lyon	58
Figure 19. GAME-ER project clusters, active companies (2020-2024) in the Dundee, Lyon, Bordeaux, Turin, Brno, and Fundão clusters.....	60

Figure 20. Number of companies, games released, and MobyGames collectors per region	65
Figure 21. Selection of European Regions specialized in Videogame industry according to GAME-ER metrics.....	69
Figure 22. Platform specialization in companies per region	71
Figure 23. Specialization by company role per region.....	74
Figure 24. Number of active companies 2020-2024 (horizontal axis) per share of main role performed by local firms: (vertical axis). Dashed line: European average	77
Figure 25. Number of companies and number of average games per region	82
Figure 26. Number of companies and number of average games collected per region (GAME-ER clusters in green)	84
Figure 27. Number of active companies 2020-2024 vs 2000-2004.....	87
Figure 28. VGI Location quotients based on the number of companies and compared to country level (axis X) and European average (axis Y). GAME-ER clusters in green. GDP used as an economic indicator of regional and the total size of the economy.....	90
Figure 29. VGI Location quotients based on the number of games released and compared to country level (axis X) and European average (axis Y). GAME-ER clusters in green. GDP used as an economic indicator of regional and the total size of the economy.....	91
Figure 30. VGI Location quotients based on the number of games collected by MobyGameea users and compared to country level (axis X) and European average (axis Y). GAME-ER clusters in green. GDP used as an economic indicator of regional and the total size of the economy.....	92
Figure 31. Regional concentration of VGI as measured by number of games per company (horizontal axis) and number of games collected by users (vertical axis), 2020-2024	95

List of Tables

Table 1. Methodological trade-offs and strategies adopted (in bold)	18
Table 2. Data sources deployed and key features	20
Table 3. List of the relevant NACE Rev. 2 codes	23
Table 4. Top 10 countries and GAME-ER partner countries per n. matched companies, retention rates and average number of games	30
Table 5. Retention rates across countries (by total number of active companies matched in Step 2 vs. companies matched in Step 1)	31
Table 6. Top 10 countries plus GAME-ER partners per number of companies identified: overview of the coverage relative to turnover and employment	32
Table 7. Orbis employment and turnover data coverage: aggregate key figures by data availability category	33
Table 8. Orbis data availability on firms' period of activity	36
<i>Table 9. Distribution of companies, games and key figures per country</i>	<i>37</i>
Table 10. Distribution of active companies across European countries per period of analysis	38
<i>Table 11. Distribution of active companies' games across European countries and platforms (as a percentage of total number of games)</i>	<i>41</i>
Table 12. Distribution of active companies across European countries by main roles in the video game value chain	43
Table 13. Average number of games across platforms and company roles	44
Table 14. Distribution of primary NACE codes for the 4,067 European companies identified	46
Table 15. GAME-ER Clusters: Role and Platform Specialization	81
Table 16. Retention rates and total average number of games across all European countries (by total number of companies matched in Step 2 vs. companies registered in MobyGames)	102
Table 17. Retention rates across countries (by total number of active companies matched in Step 2 vs. companies matched in Step 1)	103
Table 18. Correctness of company matching per quartile based on the number of games developed or published	105
Table 19. Correctness of geo-localisation per quartile based on the number of games developed or published	105

Table 20. Comparison between turnover and employment information (available in Orbis) for the final set of European companies localized at NUTS-2 level in the countries analysed	106
Table 21. Number of games across platforms and countries of companies active between 2020 and 2024.....	107
Table 22. Number of active companies between 2020 and 2024 across roles and countries	108
Table 23. Top 15 NACE codes per GAME-ER partner countries (as a % of total number of companies)	109
Table 24. Top 10 NACE Rev.2 codes per GAME-ER partner countries (as percentages).....	110
Table 25. Top 3 most frequent NACE codes in each GAME-ER project partner country	111
Table 26. Top 3 most frequent NACE codes in each GAME-ER project partner country (total number of companies vs. active companies)	111
Table 27. Distribution of active companies' NACE codes	112

EXECUTIVE SUMMARY

The **GAME-ER** project aims to understand the spatial organisation and clustering dynamics of the video game industry (VGI) in Europe, focusing on local and regional clusters outside major cities. This report responds to the objectives of the **GAME-ER** project by addressing the following research questions:

- 1. What strategies can be adopted to overcome current limitations in data availability and industry classification for accurately mapping the video game industry at the European level?*
- 2. Which types of data sources and methodological approaches are most suitable for developing a robust, data-driven framework to identify, geo-locate, and profile video game companies across European regions?*
- 3. In what ways can quantitative spatial analysis contribute to understanding patterns of industrial specialization and the emergence of clustering dynamics in the European video game sector?*

The report, prepared by **UNITO**, is the output of T2.2, run between M4 and M18 of the **GAME-ER** project, whose goal has been the collection of firm level data of companies using a data-driven approach to produce a spatial analysis of video game clusters. More specifically, the objectives of report are:

- To present the data-driven strategy (rationales, sources, methods and challenges) developed within the **GAME-ER** project for the identification and geolocation of video game companies operating in Europe.
- To provide a comprehensive geographical knowledge base on the video game industry in Europe.
- To carry out a quantitative spatial analysis of the European video game industry at the regional (NUTS-2) level.

The main key outputs of the deliverable can be summarized as follow:

- The data-driven mapping strategy implemented by **GAME-ER** provides for the first time a **spatially representative sample of 4000 companies operating in the European videogame industry**, obtained by combining company information through text-similarity matching few but rich and harmonized sources, privileging temporal depth and analytical consistency of data.

- The company database addresses the measurement challenges revealing the distribution of videogame companies according to their primary Standard Industrial Classification (SIC) codes. A significant **41.44% of active firms are classified under code 62.01 "Computer programming activities"**, followed by **25.50% under code 58.21 "Publishing of computer games"**. The remaining **33% of companies are distributed across more than 30 different primary SIC codes**. Notably, the distribution of these codes varies partly across countries.
- The research highlights significant **challenges in obtaining a comprehensive economic overview of the video game sector** at the European level. The analysis reveals substantial **limitations in using business registers due to the lack of homogeneity and completeness of information** sources across different countries. To address these limitations, the **GAME-ER** project employed **alternative proxy indicators more directly linked to video game production**.
- Through the use of metrics of regional specializations, **the regional analysis, carried out at the NUTS-2 level**, provides a first comparative view of the sector's spatial concentration and helps identify and characterize **62 European regions displaying degrees of specialization in the video game industry**, including those where **GAME-ER** clusters are located.

1 INTRODUCTION

1.1 Project overview

The Gaming Clusters Across Multiple European Regions (**GAME-ER**) project aims to explore the emergence, development, and sustainability of video game clusters, with a specific focus on local and regional clusters. The project will develop a comprehensive Interactive Methodological Toolkit, featuring policy and practical recommendations designed to assist local and national policymakers in establishing or enhancing Cultural and Creative Industries (CCIs) clusters within their regions or cities. Existing research often focuses on clusters outside Europe or within major metropolitan areas like Helsinki or Hamburg. However, **GAME-ER** addresses a critical gap by studying the dynamics of smaller, regional clusters, which play a significant role in driving innovation, growth, and regional cohesion. The project's core component involves a comparative analysis of six clusters in five European countries—France, the Czech Republic, Italy, Scotland, and Portugal. These clusters were chosen for their diverse levels of maturity and unique characteristics, including concentrations of creative talent and companies. In addition to this comparative study, **GAME-ER** will conduct a Europe-wide analysis of the spatial organization of the video games industry, specifically focusing on local and regional ecosystems. This research, conducted in collaboration with policymakers and industry stakeholders, will guide the formulation of actionable recommendations using a participatory approach. **GAME-ER** brings together 15 partners from 9 countries, encompassing expertise in social sciences, humanities, policymaking, business, and innovation.

1.2 Objectives of the Deliverable

Deliverable 2.2 (D2.2) presents the spatial quantitative analysis conducted by GAME-ER to map the geography of the videogame industry and identify European regions with major specialisation and video game clusters.¹ More specifically, the objectives of D2.2 are:

- **To present the data-driven strategy developed within the **GAME-ER** project for the identification and geolocation of video game companies operating in Europe**, including the methodological innovations adopted to address existing data and classification limitations.
- **To carry out a quantitative spatial analysis of the European video game industry at the regional (NUTS-2) level**, with the aim of identifying the spatial structure of this sector, in terms of both major industrial hubs and emerging loci of specialization.
- **To provide a comprehensive geographical knowledge base on the video game industry in Europe**, delivering empirically grounded insights that can inform and be used in other WPs.

¹ The focus of the GAME-ER project is on the video game industry consisting of companies involved in the creation, publishing, and distribution of video games.

1.3 Research questions and structure of the deliverable

The **GAME-ER** project aims to provide the first comprehensive mapping of the economic and spatial organisation of the European video game industry through a data-driven, experimental methodology.² This deliverable contributes to this goal by tackling one of the central methodological challenges: how to delineate and measure the geography of the sector in the absence of clear standardised industrial classifications and robust statistical data at the European level.

The main research questions of this report are the following:

1. *What strategies can be adopted to overcome current limitations in data availability and industry classification for accurately mapping the video game industry at the European level?*
2. *Which types of data sources and methodological approaches are most suitable for developing a robust, data-driven framework to identify, geolocate, and profile video game companies across European regions?*
3. *In what ways can quantitative spatial analysis contribute to understanding patterns of industrial specialization and the emergence of clustering dynamics in the European video game sector?*

This report is the output of Task 2.2, run between Month 4 and Month 18 of the **GAME-ER** project, whose goal has been the collection of firm level data of companies using a data-driven approach to produce a spatial analysis of video game clusters.

The report is divided into three main sections. The first part illustrates the methodological framework, and the data construction process developed to identify and geolocate video game companies operating in Europe. It introduces the primary sources and details the two-step matching strategy used to integrate digital traces of game production with firm-level business registers. This part also discusses the robustness of the resulting dataset and addresses the main limitations that persist in terms of coverage and precision.

The second section introduces the database of European video game companies obtained and presents some illustrative patterns using a granular perspective, based on the geolocation of firms across Europe. Drawing on company-level data, it explores the sector's spatial distribution through a set of visualisations that captures temporal dynamics, production roles, and platform specialisation. This part is mainly intended to show the potential of the information system built within the **GAME-ER** project to observe different spatial patterns.

The third section reports findings from the regional analysis of the industry using measures of industrial specialisation and other indicators to characterize the regional videogame production

² The 2014 NESTA report provides the methodological benchmark and departure point for the GAME-ER project, however, this previous study was limited to the mapping and analysis of the UK video game industry.

systems. The analysis, carried out at the NUTS-2 level, provides a first comparative view of the sector's spatial concentration and helps identify European regions displaying specialization in the video game industry, laying the groundwork for further analyses that will be performed on Task 2.3 (T2.3), devoted to a full characterization of videogame clusters based on regional data and their linkages with the industrial and innovation ecosystems.

1.4 Challenges and issues in the identification and mapping of the video game sector

Deliverable 2.1 (D2.1) – *“Report on the current state-of-knowledge of the videogame industry as CCI”* – already emphasised how traditional business statistics and standard industrial classifications currently represent a major limitation for measuring and mapping the videogame industry. The NACE (Statistical Classification of Economic Activities in the European Community) classification, which serves as the standard system for categorising European industries, has been long acknowledged to provide an incomplete or inaccurate coverage of the Cultural and Creative sectors in general, but this limitation especially applies for the video games ecosystem, leading to a partial representation of activities within the sector (EU Commission, 2023).

So far, existing attempts to map the video game industry have been conducted by industry and trade associations mainly at the national level (NESTA, 2014), generally based on members' information or ad-hoc surveys (EGDF, 2020, 2021; UKIE 2025), which might not guarantee a representative coverage of the sector, also in terms of comparability across European countries. To overcome the limitations imposed by standard industrial classifications to accurately identify firms operating in the videogame industry, more data-driven and bottom-up approaches have been proposed and tested, in particular with reference to the UK context.

In particular, the 2014 NESTA report *“A Map of the UK Games Industry”* (Mateos-Garcia et al., 2014) represents pioneering research that has proven the feasibility of applying a data-driven method to measure and map the videogame sector. The NESTA study has developed a methodology that combines web sources with business registries to identify and map the companies operating across different segments of the video games value chain in the UK (i.e., developers, publishers, distributors, etc.). Data on video game companies has been collected through web directories with information about video games titles, developers and publishers, and other websites covering the video games industry. By using validated data scraping and text matching techniques, the name of the active companies in the UK has been linked to business information available in company register databases, allowing obtaining information on their location and economic structure.

The 2014 NESTA report demonstrated the feasibility and potential of using a data-driven approach to map a country's video game industry and served as inspiration for the **GAME-ER** project. However, the **GAME-ER** project faced methodological challenges and trade-offs in the design of such an approach, especially considering the scale and complexity of the European video game industry.

1.4.1 *Methodological challenges and trade-offs in a data-driven mapping strategy*

The spatial mapping of the video game industry in Europe entails several methodological challenges that are particularly relevant when adopting a data-driven and bottom-up approach. In this context, different strategies for data collection and integration come with inherent trade-offs, which shape the quality, scope, and analytical potential of the resulting dataset. The following dimensions illustrate the key decisions and tensions that this approach implies.

Sectoral coverage vs. Analytical consistency of companies' information: in a data-driven strategy, a broad array of sources – including web directories, databases of video game titles, developer and publisher listings, information from trade associations and business registers – is essential to ensure wide coverage of companies involved in game production. This heterogeneity enhances sectoral representativeness, but risks introducing inconsistencies across sources in terms of the information available for each firm. While some sources offer rich metadata, others provide only minimal identifiers. As a result, a trade-off lies at the risk that this variability results in uneven coverage across variables such as firm activity, number of games produced, or date of establishment. Such gaps, if not harmonized, may generate missing data that weaken the analytical robustness and cross-sectional comparability of the dataset. In contrast, focusing on few, high-quality sources for identifying companies and then matching them to harmonized business registers might allow for better data integration and analytical coherence. This approach sacrifices some sectoral granularity but might enable the construction of a representative and analytically reliable sample of the European video game sector.

Scalability vs. Certainty in linking firm data: a further methodological challenge emerges when attempting to link firm names available in structured business registers with those present in web directories and videogame companies' databases. In the absence of unique identifiers, this process requires resolving company identities from unstandardized textual inputs. Text-matching techniques, which rely on similarity thresholds, offer a scalable solution to this task and enable the inclusion of a larger number of potentially relevant firms. However, they also entail a significant risk of misclassification or false positives, particularly when firm names are ambiguous or only partially informative. Deterministic approaches – such as selecting firms through verified industry codes or direct manual validation – can yield greater classification accuracy but are substantially more resource-intensive and may not be feasible at scale. The trade-off, therefore, lies between reducing the cost and increasing the reach of firm identification versus maintaining higher precision in firm selection, with direct consequences for the consistency and reliability of the resulting dataset.

Breadth of Coverage vs. Temporal Depth of Information: maximizing the coverage of active companies – particularly start-ups and indie developers – is facilitated by using recent and dynamic online sources. However, such sources often lack information with temporal depth (e.g. information on active companies or games released only in recent times), thereby limiting the ability to conduct longitudinal analyses of industry development or firm trajectories.

Conversely, relying on data sources that privilege companies' activity over time may under-represent the most recent actors and dynamics of the sector, but might ensure the temporal continuity needed to analyse industrial evolution over time, which is also a perspective pursued by **GAME-ER** in the study of videogame clusters (such as in Task 4.3).

Country-specific coverage vs. Cross-national harmonization: Geo-locating firms at the European scale raises the issue of how to obtain spatially precise and consistent data across countries. National industry directories or local trade associations may provide accurate data, but their availability and quality vary significantly between countries. This heterogeneity complicates the integration of geographic and other relevant firm information in a pan-European framework. The trade-off here is between exploiting rich, country-specific sources – at the cost of potential spatial biases and inconsistency – or relying on more aggregated data sources of business registers (such as Orbis), which provide uniform, though sometimes less updated or detailed data. The latter option enhances cross-country comparability, a critical requirement for spatial analyses at the European level.

1.5 The GAME-ER data-driven mapping strategy

Table 1 summarizes the methodological trade-offs identified by **GAME-ER** in setting up the data-driven mapping strategy, displays the alternative paths that were considered, and highlights (in green) the options chosen.

Table 1. Methodological trade-offs and strategies adopted (in bold)

Trade-off	Description	Alternative Options
1. Sectoral coverage vs Analytical consistency	Richer sectoral coverage vs. risk of inconsistent and fragmented information; potential analytical weaknesses due to missing data across variables	• Multiple heterogeneous sources (e.g. directories, databases, associations) • Few harmonized and information-rich sources
2. Scalability vs Certainty in firm data matching	Higher inclusiveness and coverage vs. lower confidence in firm relevance; risk of false positives or sector misclassification impacting analysis	• Direct selection from official registers with verified codes • Text matching with similarity thresholds

3. Coverage breadth vs. temporal depth	Better representation of present-day dynamics vs. reduced ability to trace firm or sector trajectories over time	• Focus on current and emerging companies • Privilege sources with historical data for longitudinal analysis
4. Country-specific coverage vs Cross-national harmonization	Greater spatial accuracy vs. reduced cross-national comparability; risk of uneven coverage and integration difficulties	• Country-level sources of business registers • Aggregated data on different business registers

For the first dimension – **Sectoral coverage vs. Analytical consistency** – the strategy prioritized has been to opt for a limited number of harmonized and information-rich sources. This choice reduces sectoral granularity but enhances data consistency across variables and national contexts, ensuring a more coherent analytical foundation. In relation to **Scalability vs. Certainty in firm data matching**, the approach has adopted text-matching techniques based on similarity thresholds. This enables broader firm inclusion, especially for companies not classified under conventional industry codes, albeit at the cost of lower certainty in firm identification and relevance. Concerning **Coverage breadth vs. Temporal depth**, it has been decided to privilege sources that allow for historical reconstruction of firm trajectories. This facilitates longitudinal analysis and the investigation of structural patterns within the industry over time, beyond static snapshots of current market actors. Finally, to address the trade-off between **Country-specific coverage and Cross-national harmonization**, the selected approach has been to obtain firm-level data from a harmonized database of different business registers. This ensures spatial representativeness while supporting a degree of harmonization across diverse national registry systems.

While the next section clarifies in more detail the source of data selected and the methods adopted to design the data-driven strategy, it is worth to synthesise here the strategy adopted.

In a nutshell, the data-driven mapping strategy implemented by **GAME-ER** provides a spatially representative sample of the European videogame industry obtained by combining companies' information through text-similarity matching few but rich and harmonized sources, prioritizing temporal depth and analytical consistency of data.

2 DATA AND METHODOLOGY

To identify video game companies at the European level, T2.2 adopted a two-step data-driven methodology combining data from different sources, leading to the construction of a database at company level. First, information from online web repositories of video game titles and companies has been obtained and matched to create a first list of firms with their respective video game titles and headquarters location (at the national level). When the information on the country of origin was missing, T2.2 deployed an open-source large language model (LLM) to determine the nationality of the company. In a second step, more detailed business and location information has been added matching the European companies previously identified with data from proprietary business registers. In what follows, Section 2.1 first illustrates the databases deployed as main sources of information and their characteristics, while Section 2.2 presents in greater detail the implementation of the two-step approach elaborated, and the characteristics of the final dataset of video games companies thus obtained.

2.1 Data sources

Three main databases have been used as information sources. Firstly, data on video game companies and titles have been extracted through web-scraping techniques, cleaned and combined from MobyGames and the Online Games Daten Bank (OGDB). Secondly, the dataset obtained from the first match between MobyGames and OGDB has been integrated with information from the Moody's Orbis business register. The following sections provide an overview of the three data sources selected, and Table 2 outlines the main characteristics and the specific variables that could be constructed.

Table 2. Data sources deployed and key features

Data source	Type of information	Variables at the company level	Variables at the game level	Pros of the Database	Limitations of the Database
MobyGames	- Video game companies (55,000 ~) - Game titles (180,000 ~ including different releases)	- Role of the company: developer, publisher, distributor, game engine, other tasks (i.e. music, sound, middleware)	- Year of release of the game, - Title and Platform of release (first platform of release), - Artistic attributes of the game: genre, perspective, visual attributes, gameplay, - Moby Score (proxy for quality), number of collectors (proxy for popularity), n. of critics - Business model	- Identify active companies in periods based on the year of game release, - Characterize companies in the VG sector based on game info, - Identifying Publisher-Developers relations or other form of collaborations	Information on the nationality of the company is missing

Online Games Daten Bank (OGDB)	- Video game companies (30,000 ~ worldwide, of which 12,000 ~ at the EU level) - Game titles (100,000 ~)	- Nationality - Status of the company (active, inactive, bought out, etc.)	- Title and platform of release - Year of release, - Status of the game (out, in development, unknown)	Systematic info on the nationality of the company	Not as rich as MobyGames
Orbis	- Global database of company information	- Company name, BvD ID - NACE codes - Geo localization at the NUT2 level: Country, City, Address, NUTS-2 and NUTS3 codes - Company status: Active/Inactive - Business and financial data: Operating revenues/turnover, N. employees, management structure	No information on final products	- Possibility to precisely locate at NUTS-2 level videogame companies - Possibility of using the Country and NACE codes information to delimit the perimeter of the company searches	Uneven data availability (across countries and industries)

2.1.1 MobyGames

The first, and pivotal, data source exploited in the database construction process is MobyGames.³ The website provides an open and comprehensive catalog of video games companies and titles, which has been already extensively exploited in both academic (Storz, 2015; Balland, De Vaan, and Boschma 2013; De Vaan, Boschma, and Frenken 2013; De Vaan, Frenken, and Boschma 2019; Storz, Riboldazzi, and John 2015) and policy studies on the video game sector (NESTA & UKIE, 2014).

Supported by a large and active community of contributors, MobyGames currently contains almost 55,000 companies and more than 300,000 game titles and releases. Recently acquired by Atari,⁴ the database spans a broad temporal range, from the first arcade games of the 1950s up to the most recent game titles. Notably, MobyGames offers rich and detailed records at various levels, including company, game, and individual game releases.

Specifically, for the purposes of the database construction, relevant information was collected via web scraping across these three levels. At the company level, the firm name and its unique MobyGames identifier have been extracted. This company-level data was then linked to the game title pages, which contain detailed attributes of the game, such as the year of release, the platforms

³ For further information, please visit: <https://www.MobyGames.com/info/about/>

⁴ For further information, please visit MobyGames: <https://www.MobyGames.com/info/faq5/>

of release, genre, visual and gameplay perspective, the commercialization model adopted, and several rating metrics (such as, the critics score, the Moby Score, and the number of collectors).

Additionally, data from the game release page was used to identify the roles of the companies involved in each game's development and distribution process. These roles include, but are not limited to, developer, publisher, distributor, game engine provider, sound or music engineering.

2.1.2 *Online Games Daten Bank (OGDB)*

The Online Games Daten Bank (OGDB) is a German web repository containing information on video game titles and companies.⁵ In the construction of the **GAME-ER** project database of video game companies, OGDB served as a key complementary data source. Although its structure and content are similar to MobyGames, OGDB is less comprehensive, listing approximately 30,000 companies (De Vaan, Boschma, and Frenken, 2013; De Vaan, 2015; De Vaan, Frenken, and Boschma, 2019).

A distinctive advantage of OGDB lies in its systematic inclusion of company nationality, a feature not consistently available in MobyGames. Due to this important feature, OGDB was scraped and used specifically to assign national identifiers to the video game companies originally extracted from the MobyGames database.

2.1.3 *Moody's Orbis*

Orbis is a comprehensive commercial database owned by Moody's. It provides cross-country financial and business information on private and listed companies in all industries except agriculture and the public services (OECD et al., 2020). Despite its broad coverage and frequent use in academic and policy research, Orbis is subject to known limitations in data completeness and consistency. These limitations vary significantly across countries, industries, time periods and across variables (Arndt, 2023; Kalemli-Ozcan et al., 2022).

Within the context of the **GAME-ER** project, and particularly the T2.2, the Orbis database was essential in retrieving the necessary firm-level information – primarily, company' addresses – allowing for the georeferencing and location of the video game firms, identified in MobyGames and matched with OGDB, at the city level. In addition, Orbis was instrumental in identifying the industrial classification codes under which these companies report their economic activities.

A standardized search protocol was applied for each European country included in the analysis.⁶ Specifically, every country-based Orbis search retained companies with the following uniform set of criteria: active, inactive, and unknown statuses with information from the January 1, 2000, onwards

⁵ Please visit OGDB: <https://ogdb.eu/>

⁶ In this study, the European countries considered in the analysis are the 27 EU member states together with the UK, Iceland, Norway, Switzerland, Serbia, Montenegro, Bosnia, North Macedonia, Albania, Moldavia, and Türkiye.

and operating under at least one of the 31 primary NACE Rev. 2 codes deemed relevant to the video game sector. This set of NACE codes was compiled by the T2.2 team based on an accurate review of previous studies and reports analysing the positioning of sector within standard industrial classifications (UNCTAD, 2010; UNESCO, 2013; EU Commission, ECORYS, and KEA, 2023; KEA and PPMI, 2019) and subsequently validated by **GAME-ER** partners. The complete list of NACE codes used to identify videogame companies is provided in Table 3.

Table 3. List of the relevant NACE Rev. 2 codes

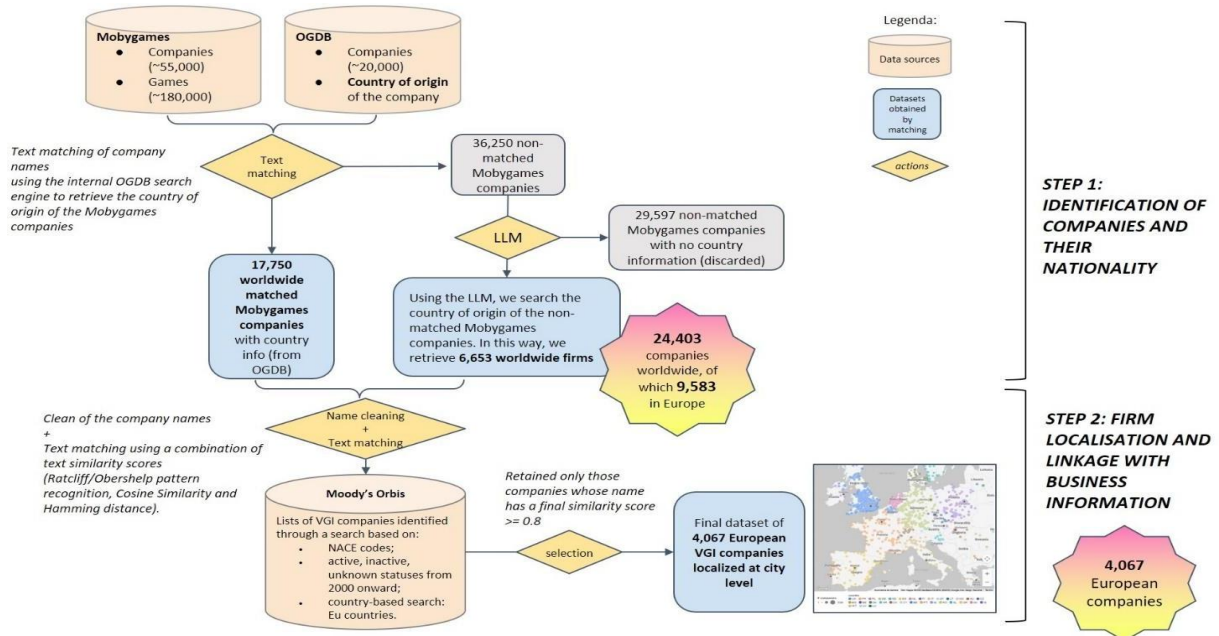
NACE CODES	Description
32.40	Manufacture of games and toys
46.43	Wholesale of electrical household appliances
46.49	Wholesale of other household goods
46.51	Wholesale of computers, computer peripheral equipment and software
46.90	Non-specialised wholesale trade
52.10	Warehousing and storage
58.21	Publishing of computer games
58.29	Other software publishing
59.10	Motion picture, video and television programme activities
59.11	Motion picture, video and television programme production activities
59.13	Motion picture, video and television programme distribution activities
62.00	Computer programming, consultancy and related activities
62.01	Computer programming activities
62.02	Computer consultancy activities
62.09	Other information technology and computer service activities
63.10	Data processing, hosting and related activities; web portals
63.11	Data processing, hosting and related activities
63.12	Web portals
72.20	Research and experimental development on social sciences and humanities
73.11	Advertising agencies
74.10	Specialised design activities
74.30	Translation and interpretation activities
82.99	Other business support service activities
85.60	Educational support activities
90.00	Creative, arts and entertainment activities

90.01	Performing arts
90.02	Support activities to performing arts
90.03	Artistic creation
93.19	Other sports activities
93.20	Amusement and recreation activities
93.29	Other amusement and recreation activities

2.2 Database construction: a two-step data-driven approach

In order to create a database of European video game companies with information on their location and other relevant information about business characteristics and videogame production, the work of the T2.2 relied on the web-scraping of both MobyGames and OGDB to retrieve an extensive list of videogame firms, and on several searches on the Orbis database to identify the specific location and business information of such companies. Therefore, once the data from these three main sources has been collected, T2.2 implemented a two-step data matching procedure. Figure 1 graphically summarizes the whole two-step process for database construction, including the outputs in terms of number companies processed in the different steps. The specific tasks performed are described in greater detail in the following sections.

Figure 1. Database construction overall procedure

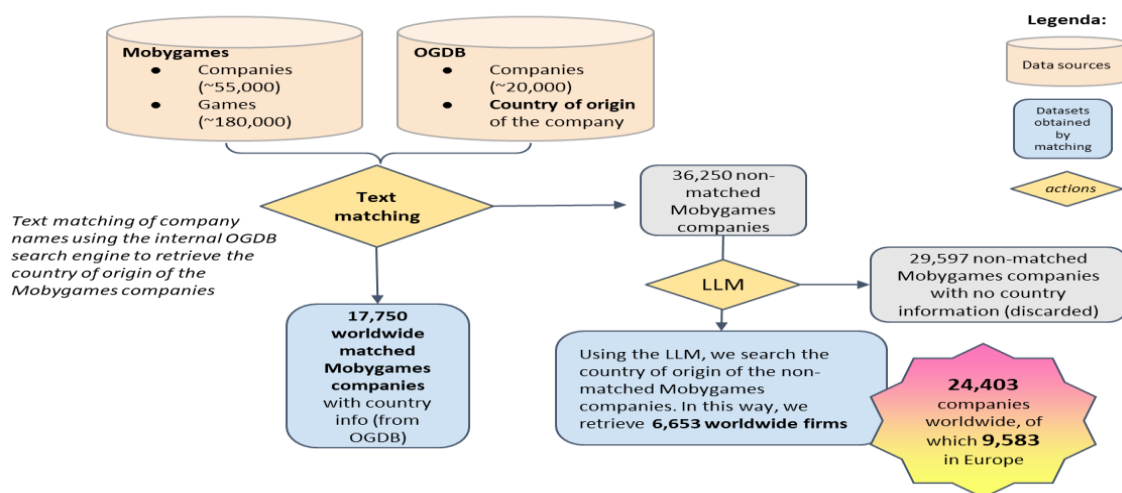


Notes: The orange boxes represent the data sources deployed, the blue and grey squares the datasets resulting from our matching procedures, with the blue ones indicating the datasets used in the subsequent steps and the grey ones representing the data discarded or not matched/available. The yellow diamonds represent the actions taken.

2.2.1 First step: Identification of companies and their nationality

The first phase of the database construction, illustrated in Figure 2, consisted in the matching of the company names retrieved from MobyGames, with those of the companies listed in the OGDB repository. Linking the MobyGames companies with those reported in OGDB was essential as OGDB provides information on the nationality of its companies, which is crucial to localize at the national level the companies reported in MobyGames.

Figure 2. Step 1: Database construction: Identification of videogame companies and their nationality



In doing so, T2.2 exploited the internal OGDB search engine to systematically match the names of the companies collected from both databases. Given that the two web repositories report information on the videogame sector in a similar fashion, the OGDB internal text search provided an efficient and accurate solution to the text matching task as it did not require any prior cleaning and harmonization of company names. Moreover, the internal OGDB search engine proved to be case insensitive and rather flexible in the presence of company names misspellings.⁷

This first matching procedure (represented as the first yellow diamond on the top-left side of Figure 2) resulted in 17,750 matched MobyGames companies worldwide with the country information retrieved from OGDB. At this stage, around 36,000 MobyGames companies were still unmatched. Focusing on this unmatched subset of MobyGames firms, T2.2 used an LLM to determine their country of origin and thus retrieve part of these records. The objective was to associate the most probable country with each unmatched MobyGames company in order to proceed to the second step of the matching with the highest number of companies localised at the national level. Following this approach, an additional set of 6,653 worldwide MobyGames companies have been located at the national level. Appending the two lists and then deduplicating the records, in the first step of the procedure T2.2 managed to identify 24,403 worldwide companies, of which 9,583 were located in Europe.

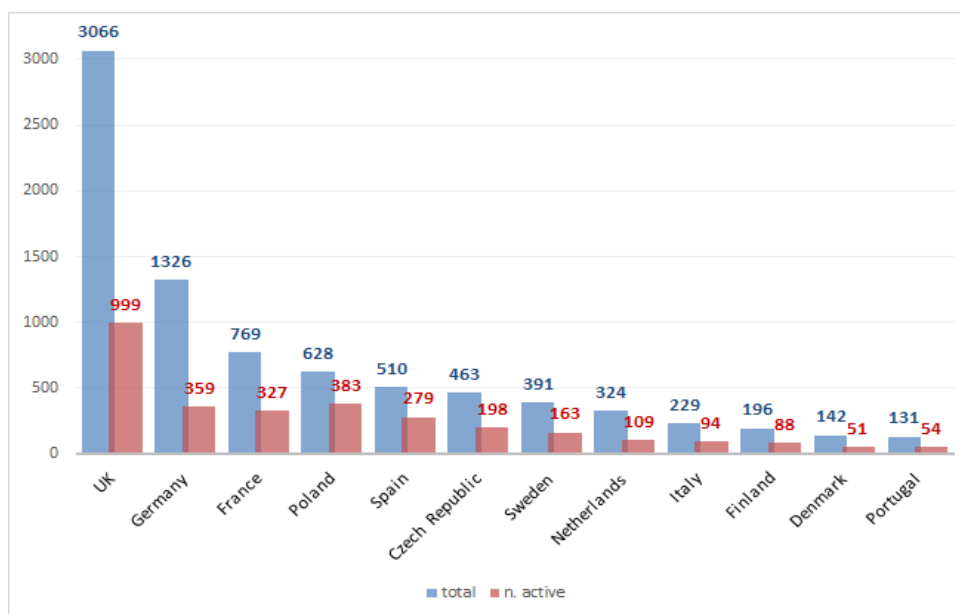
⁷ The OGDB internal search engine could correctly match company names up to three different characters.

2.2.1.1 Results of the first matching: key figures at the European level

The first step of our database construction allowed T2.2 to locate at the national level 24,403 companies spread worldwide which contributed to the release of at least one game from 1970 to 2024. Focusing on the European region, the data-driven methodology adopted by the **GAME-ER** identified 9,583 European video game firms during the same time span. Figure 2 reports the distribution of European companies by country and activity status.⁸ Based on the first release year of the first and the last video game title developed or published,⁹ the **GAME-ER** project considers active those companies that have published, developed or contributed to the release of at least one game between 2020 and 2024.

Figure 3 highlights the uneven distribution of the video game sector across European countries. The United Kingdom hosts the largest number of companies operating in the sector, with a total of 3,066 total companies, of which 999 were active in the 2020-2024 period, based on the **GAME-ER** project estimates. Germany, France, Poland, and Spain follow, each with approximately 300 active companies over the same period.

Figure 3. Results of the first matching - Top European Countries by Number of Video Game Companies



Notes: The figure displays the distribution of video game companies identified in the first step of data-driven database construction methodology in the countries with higher number of firms. Blue bars report the total number of companies, while the red bars only the number of active companies. GAME-ER elaboration.

⁸ Out of the firms identified in this step, 465 companies were excluded from the visualization reported in Figure 2 as these firms have not yet developed or published any game titles. Therefore, the histogram is based on the 9,118 companies with at least one video game title on MobyGames.

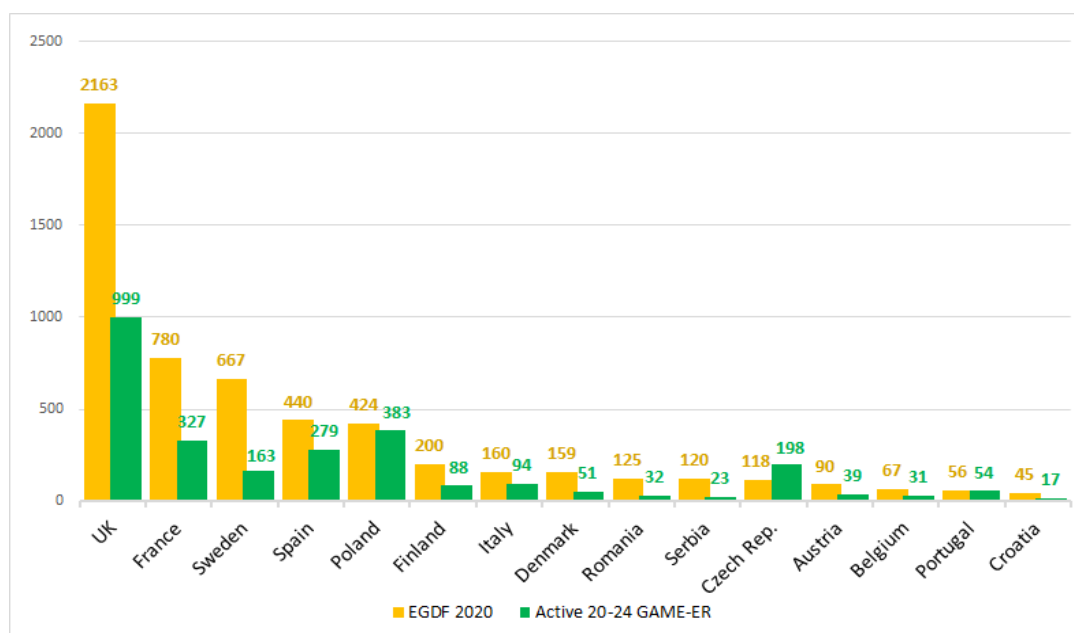
⁹ The date of release is a game-level information available in MobyGames that was easily associated with the companies identified and scraped.

2.2.1.2 Testing the robustness of the first matching: benchmarking with trade associations' estimates

To test the robustness of the adopted data-driven methodology, T2.2 presents a comparison between the results obtained from the matching performed in the first step of database construction and the data published by industry associations. In this context, the annual reports produced by the European Games Developer Federation (EGDF), and particularly the 2020 estimates, have been used as the primary benchmark (EGDF, 2020).

Figure 4 compares the distribution of video game companies across European countries. In particular, the figure contrasts the EGDF 2020 numbers and the **GAME-ER** estimates for the active companies in the period 2020-2024. Overall, the methodology implemented in the T2.2 of the **GAME-ER** project managed to identify between one-third and one-half of the number of companies reported by the EGDF in its 2020 estimates. This outcome is particularly significant given that the EGDF figures are based on direct industry observations, whereas the **GAME-ER's** Task 2.2 estimates rely on an indirect, data-driven approach to map the sector.¹⁰

Figure 4. Number of companies in selected countries reported by the EGDF in 2020 vs. GAME-ER first-step matching procedure



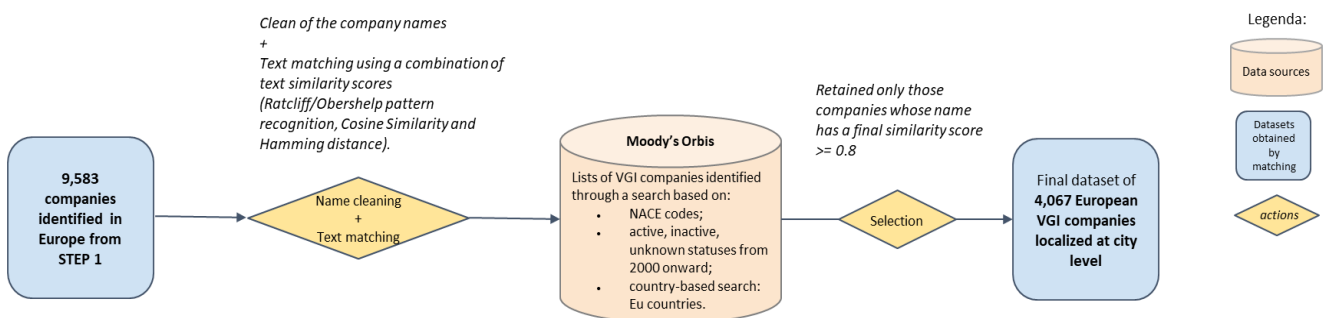
Notes: Yellow bars refer to the number of video game companies reported by the EGDF (EGDF, 2020), the green bars report the number of active companies obtained from the matching performed in the first step of database construction

¹⁰ The GAME-ER project adopts several research methodologies. On the one hand, it relies on quantitative methods, such as in the case of the data-driven methodology developed and carried out in Task 2.2. On the other hand, it adopts qualitative methods, such as interviews conducted with video game industry experts and stakeholders, as in the case of Task 4.1.

2.2.2 Second step: Firm localisation and linkage with business information

The second phase of the database construction, as illustrated in Figure 5, consisted in matching the video game companies identified in the first step to the ones contained in the lists obtained through the Orbis search by country of interest. In this way, T2.2 of the **GAME-ER** project aimed to geo-localise the 9,583 MobyGames companies located in Europe, and integrate, when available, additional business and financial data from Orbis.

Figure 5. Step 2 Database Construction - Localization of firms and linkage with business information



More precisely, the T2.2 second-step matching procedure comprised two main components.

First, company names from both Orbis and MobyGames-OGDB have been cleaned, harmonised and standardized to enhance the matching outcomes. In practice, all company legal entity acronyms, business suffixes and legal wording have been removed,¹¹ together with white spaces between names. Subsequently, T2.2 developed a specific selection procedure using text similarity score based on three metrics: the Ratcliff/Obershelp pattern recognition (Gestalt pattern matching), the Cosine similarity, and the Hamming distance. To ensure the highest accuracy of the matching process, the mean of the three resulting scores was computed, and a match was confirmed only in the case it met the following two conditions: (1) the average score was greater than a threshold level of 0.8, (2) and the most similar string found by each of the three algorithms was the same.

Following this methodology, T2.2 obtained a final dataset of 4,067 European video game companies matched to Orbis records.

2.2.2.1 Results of the second matching: The European video game companies localized at the NUTS-2 level

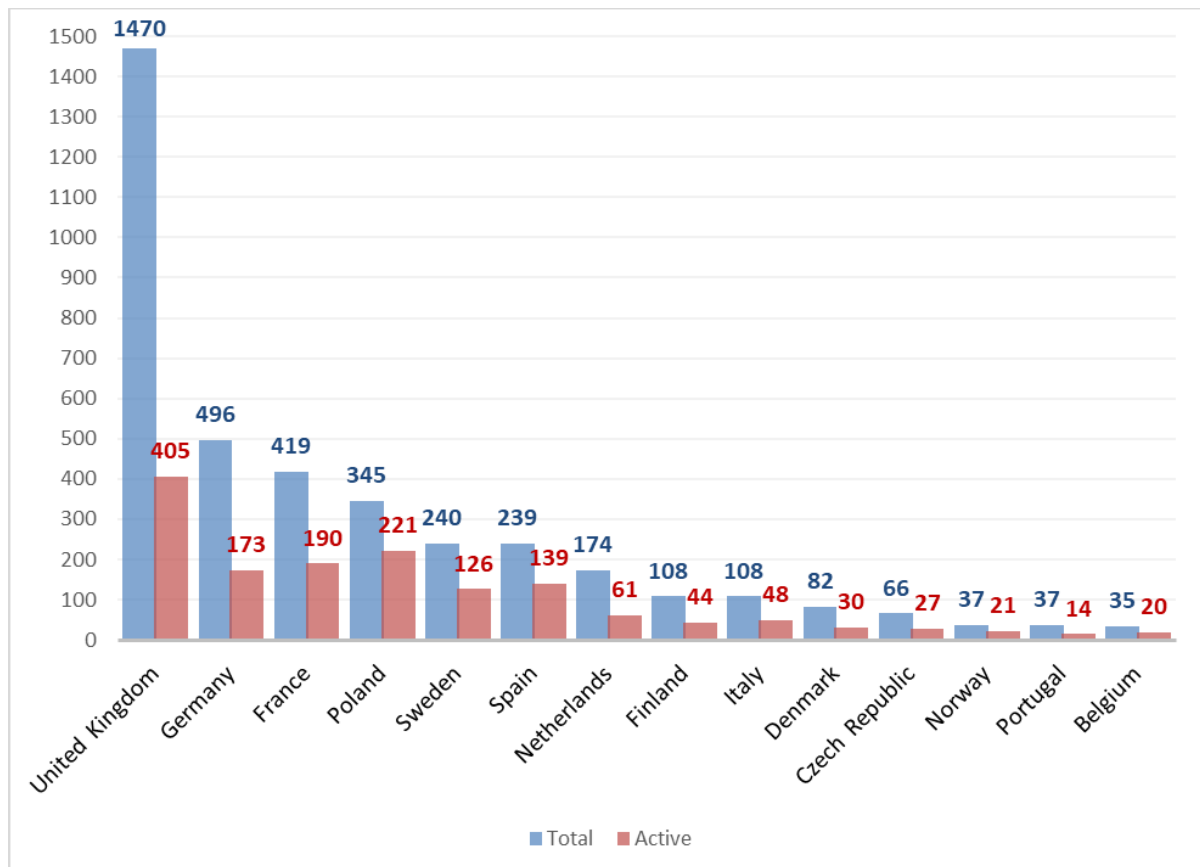
The final dataset of European companies operating in the video game sector consisted of 4,067 firms, of which 1,612 active in the period 2020 and 2024. Figure 4 shows the distribution of both total and active companies identified in the second, and final, step of T2.2 of the **GAME-ER** project database construction process.

¹¹ Examples of such terms include: "s.a.", "n.v.", "s.r.l.", "inc.", "ltd.", "limited liability company", etc.

The geographical distribution of the European video game companies matched in the second step generally follows the distribution obtained from the first step of the T2.2 data-driven identification process and previously reported in Figure 3.

As outlined in Figure 6, The United Kingdom hosts the highest number of video game companies in Europe, ranking first both in terms of total firms and those active during the 2020-2024 period. Germany and France follow, with 496 and 419 companies respectively, although in both cases fewer than half are active. Notably, Poland ranks second in terms of active companies, with 221 identified as operational in the same timeframe. This positioning highlights Poland's rapid emergence as one of the most dynamic countries in the video game landscape, whose prominence can be largely attributed to the country's specialization in video game translation and localisation services, focused primarily on PC and console games (WIPO, 2024).

Figure 6. Distribution of total and active European companies (displayed only top 15 European countries by number of total companies)



Notes: The distributions, in blue and red respectively, illustrate the total and the active video game companies identified at the country level using the two-step data-driven approach developed by the T2.2 of the GAME-ER project.

2.2.2.2 Testing the robustness of the second matching: retention rates

To evaluate the robustness of the final dataset of European video game companies, T2.2 assessed the retention rates of matched companies by country. This validation step focused on verifying possible differences across countries in the effectiveness of the data-driven methodology to geo-

localise companies and link with business information. More specifically, a retention rate is defined as the ratio between the number of companies in the final matched dataset and the number of companies initially identified in MobyGames. In this context, retention rates represent the percentage of companies retained from step 1 to step 2 of the matching procedure.

Table 4 reports the top 10 countries plus the **GAME-ER** partner countries per number of companies matched, together with the first retention rate elaborated and the additional information of the total average number of game titles per country. Overall, the retention rates reported in Table 4 are below 60%, with some particularly low values, for instance in the case of Czech Republic and Portugal. However, considering the complete sample of countries included in the analysis, approximately half of them report a retention rate above 30%, with several notable instances of retention rates well above 50%.¹² Additionally, comparing the average number of games developed or published by matched and unmatched companies reveals that matched companies tend to have, on average, a higher number of game titles. This result may indicate that the matched companies are generally bigger companies, commercially active, and thus better reported in MobyGames.

Table 4. Top 10 countries and GAME-ER partner countries per n. matched companies, retention rates and average number of games

	N. video game companies			Average n. of game titles	
Country	Matched in step 2	Unmatched in step 2	Retention rate (%)	Matched companies	Unmatched companies
United Kingdom	1470	1758	45,54	18,9	12,7
Germany	496	919	35,05	17,8	14,1
France	419	394	51,54	24,8	13,3
Poland	345	313	52,43	18,2	9,0
Sweden	240	175	57,83	12,9	4,0
Spain	239	294	44,84	10,4	7,1
Netherlands	174	164	51,48	13,3	13,8
Finland	108	97	52,68	5,4	8,0
Italy	108	130	45,38	11,0	9,9
Denmark	82	71	53,59	9,1	6,4
Czech Republic	66	401	14,13	19,9	16,5
Portugal	37	95	28,03	15,6	13,6
Belgium	35	36	49,30	8,7	4,6
Croatia	13	29	30,95	5,2	8,7

¹² See Tables 1A and 2A in Appendix for the full list of countries analysed with their respective retention rates.

Note: The retention rate is calculated as the percentage of companies retained from the first step to the second (final) step of our data-driven database construction process. Values are shown for the top 10 countries by matched-company count, plus the GAME-ER partner countries (highlighted in green). The last two columns report the average number of games released by matched companies and by unmatched companies, respectively. In the “Retention Rate” column, colour coding indicates performance levels: red for low retention, yellow/orange for average, and green for high. GAME-ER elaboration.

Additionally, to detect potential differences in the goodness of the matching procedure between active and inactive companies, a retention rate has been computed in relation to the number of active companies in the period 2020-2024 identified in the first match between MobyGames and OGDB. Table 5 reports the top 10 countries together with the **GAME-ER** partners by number of active companies matched in the final dataset, together with their respective retention rates.

This second retention rate, calculated considering only the active companies, shows, overall, better results, suggesting that matching Orbis data performed better for companies active in more recent periods. For instance, with the sole exceptions of the Czech Republic and Portugal, most of the European countries present retention rates around or above 50%.

Table 5. Retention rates across countries (by total number of active companies matched in Step 2 vs. companies matched in Step 1)

	Active companies 2020-2024		
Country	N. Active Matched in Step 2	N. Active Matched in Step 1	Retention rate step2-step1 (%)
United Kingdom	405	999	40,54
Germany	173	359	48,19
France	190	327	58,10
Poland	221	383	57,70
Sweden	126	163	77,30
Spain	139	279	49,82
Netherlands	61	109	55,96
Finland	44	88	50,00
Italy	48	94	51,06
Denmark	30	51	58,82
Czech Republic	27	198	13,64
Portugal	14	54	25,93
Belgium	20	31	64,52
Croatia	9	17	52,94

Notes: The retention rates reported have been calculated as the ratio of the number of matched companies active in the period 2020-2024 obtained in the second matching to those obtained in the first matching, for each country. In the “Retention Rate” column, colour coding indicates performance levels: red for low retention, yellow/orange for average, and green for high. GAME-ER elaboration.

2.2.2.3 Orbis data limitations

While the **GAME-ER** aimed to obtain reliable economic data of videogame companies from business register sources, T2.2 found that the main limitation in terms of data availability is generally related to Moody's Orbis uneven coverage and completeness of data across countries. The data limitations were particularly evident with company turnover and employment.

Table 6 reports the coverage of Orbis business and economic data for the companies identified in the second and final step, for major European countries and **GAME-ER** partners, showing that it is generally fragmented. Notably, the data reveals both gaps and persistent heterogeneity in the patterns of missing information across European countries.

Table 6. Top 10 countries plus GAME-ER partners per number of companies identified: overview of the coverage relative to turnover and employment

Country	Turnover			Employment		
	N. Companies Without	N. Companies With	% With Turnover Data	N. Companies Without	N. Companies With	% With Employment Data
United Kingdom	1241	229	15,58	778	692	47,07
Germany	451	45	9,07	183	313	63,10
France	167	252	60,14	357	62	14,80
Netherlands	164	10	5,75	46	128	73,56
Poland	114	231	66,96	154	191	55,36
Spain	92	147	61,51	106	133	55,65
Czech Republic	43	23	34,85	55	11	16,67
Belgium	32	3	8,57	27	8	22,86
Italy	11	97	89,81	54	54	50,00
Portugal	10	27	72,97	7	30	81,08
Croatia	1	12	92,31	1	12	92,31

Notes: The table reports the number of companies for which the information of turnover and employment is available and the percentage of information coverage by country (in green the GAME-ER partner countries).

Table 7 shows how video game companies are distributed according to the availability of turnover and employment data. It also shows metrics derived from MobyGames data, including aggregate and average numbers of games and credited people and the average number of MobyGames users

collecting the games (Avg. Collected by)¹³. It is notable that only around 20% of the final dataset of European video game companies contains complete information on both turnover and employment. Companies in this group with comprehensive information report on a higher average number of games and credited individuals, suggesting that they represent the most substantial and established industry players. However, the correlation between the availability of business information and video game production metrics becomes less pronounced when examining other data categories. Specifically, companies with partial business information (i.e. either employment or turnover data) exhibit comparable, or even lower, production metrics than companies with no business information at all. This observation highlights the limitations of using incomplete business data to analyse the structural dynamics of the video game sector.

Table 7. Orbis employment and turnover data coverage: aggregate key figures by data availability category

Category of data availability	N. Companies	N. Games	N. People Credited	N. Collected by	Avg. Games	Avg. People Credited	Avg. Collected by
Complete (With both Turnover and Employment)	974	20.855	2.671.298	691.473	22,4	174,0	23,1
Employment only	1.112	1.061	1.600.181	418.246	14,6	134,3	20,8
Turnover only	577	6.114	1.065.155	225.508	11,0	149,3	23,8
Incomplete (Without both Turnover and Employment)	1.404	21.753	2.716.960	660.030	16,5	117,2	22,5

Notes: The table reports the aggregate number of companies and their corresponding key figures (total number and average number of video games, collectors, and credited people) for the four different Orbis data coverage categories: complete information of both turnover and employment is available, information on employment only, information on turnover only, and missing information on both turnover and employment. GAME-ER project T2.2 elaboration.

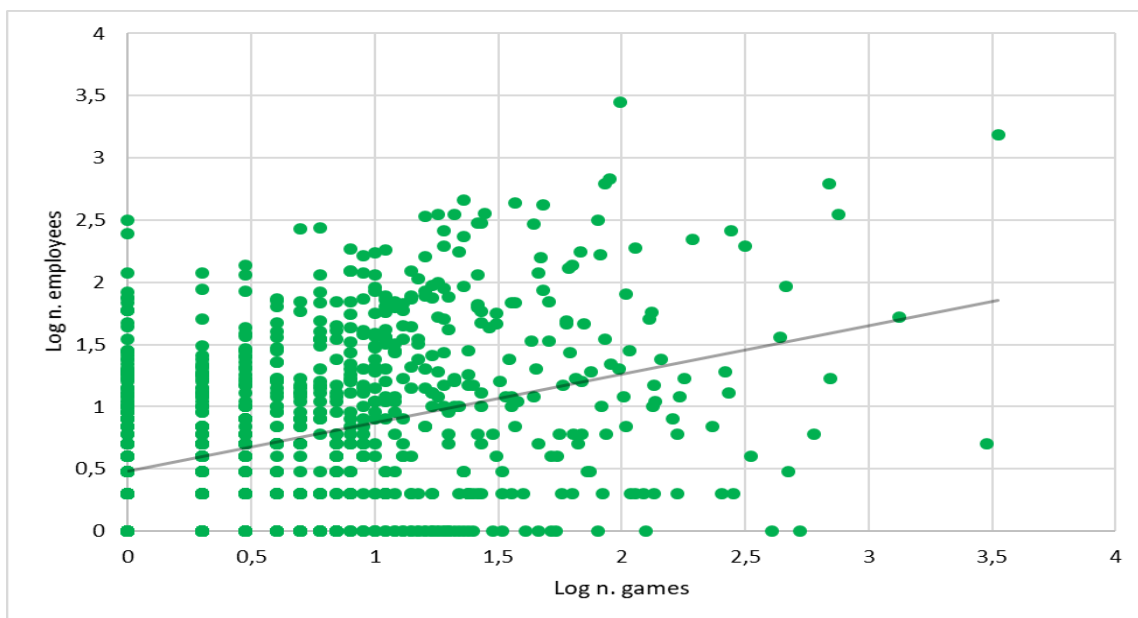
Notwithstanding such limitations, it is possible to identify a positive relationship between firm size and video game production and demand metrics. Considering companies with employment data on Orbis, Figure 7 presents the distribution of companies according to their number of employees (as recorded in the last available year by Orbis) alongside the total number of video games released,

¹³ MobyGames user community have the possibility to signal through the “collect” option if they own or played a game. Users with a MobyGames account can create and manage their personal game collection, adding titles to a list of games they have acquired or experienced. This feature helps users keep track of their gaming history and share it with others. This metric could be considered as a proxy of the popularity of a videogame.

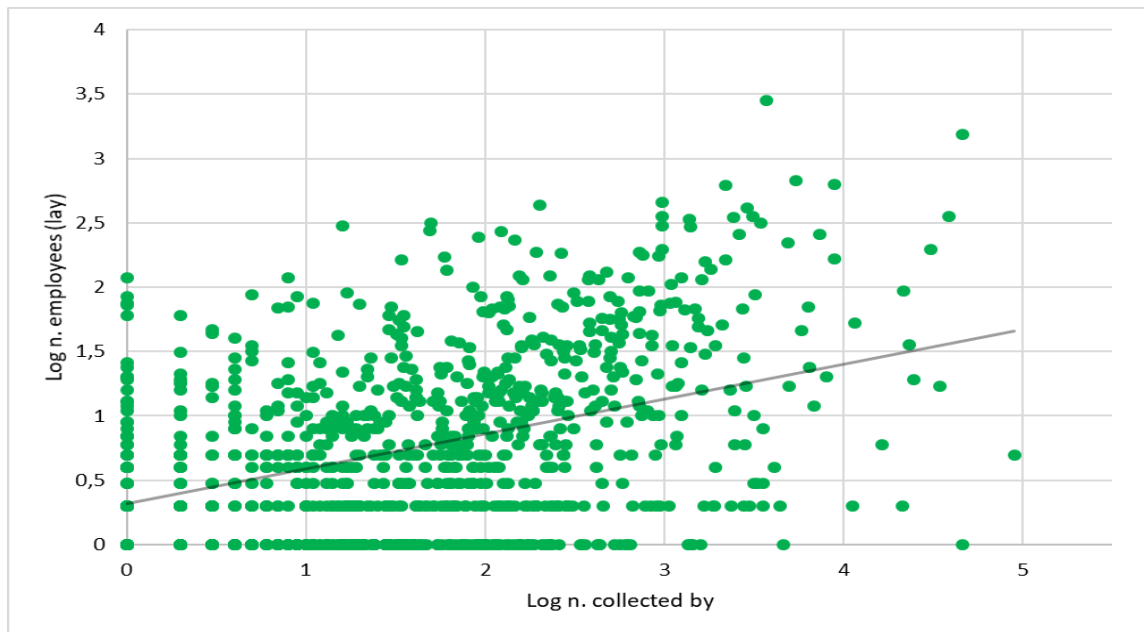
number of MobyGames collectors and people credited in the video games. Across all the scatter plots, a positive relationship emerges, indicating that larger companies – those with more employees – tend to release a higher number or video games (or videogames more acclaimed), and involve more individuals in their development projects. This evidence suggests that, despite the constraints in comprehensive economic information, MobyGames-derived metrics might provide a potential alternative for understanding the structural dynamics of the videogame industry.

Figure 7. Video game company employment of active companies in 2020-2024 vs. games, collectors, and credited people (all variables transformed in logarithmic scale)

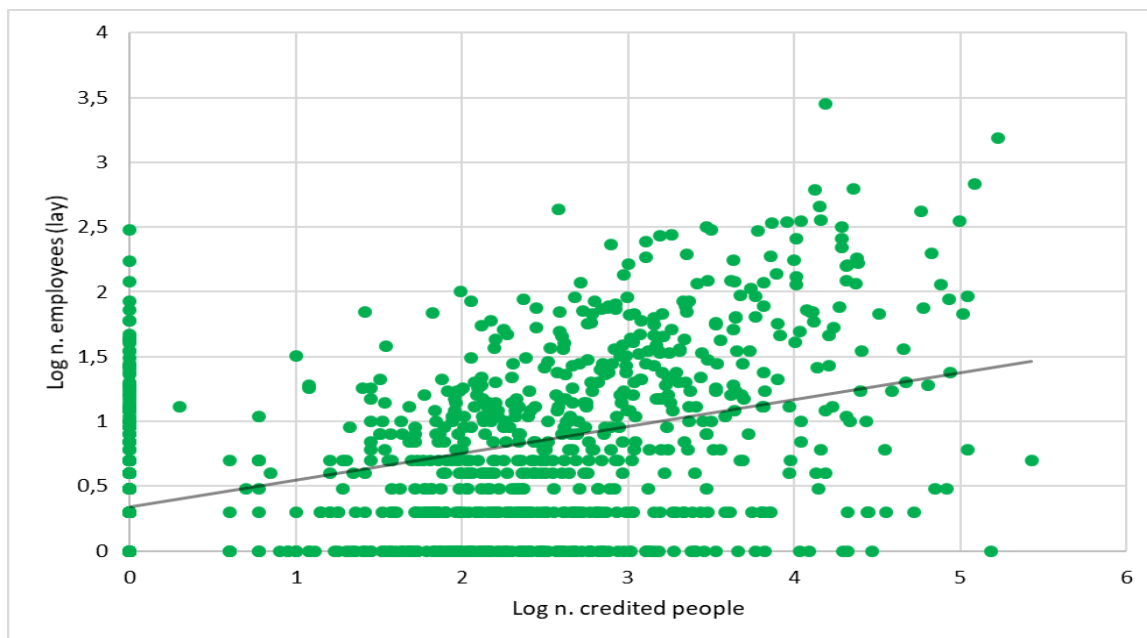
1. Log of employment (last available year) and log of n. games



2. Log of employment (last available year) and log of n. collected by



3. Log of employment (last available year) and log of n. people credited



Notes: The scatter plots display the distribution of companies based on the logarithm of the number of employees recorded in the last available year in the Orbis database and the three MobyGames variables, respectively, the logarithm of the number of games produced, the logarithm of the number of collectors, and the logarithm of the number of credited people. GAME-ER T2.2 elaboration.

Like business data, the information regarding the period of activity of the companies recorded in Orbis is partly incomplete or not perfectly coherent with that which can be inferred from the game release data via the MobyGames metrics. Table 8 illustrates this problem displaying the information about company status and the accuracy of information about recorded years of establishment.

While a total of 2,630 companies is considered active according to Orbis, for only 1,784 firms (67%) there is available information about the year of establishment. Similarly, for the inactive companies, only 937 have information on the year of establishment (65%).

Table 8. Orbis data availability on firms' period of activity

		Year of establishment	
		Available	Missing
Company status	Active	1784	846
	Inactive	937	500

Given that Orbis risks losing information about the period of activity for 1,346 companies, MobyGames metrics still present a more comprehensive source of information to analyse the temporal evolution of video game companies. For instance, the information provided by MobyGames offers game release data for all companies in our dataset. This allows to track each company's period of activity by identifying their first and last game releases. While game releases are an imperfect proxy of the precise period of activity of the company (a company might be operating even in years in which it does not release games) they nonetheless represent a viable alternative to Orbis company activity data.

3 MAPPING THE VIDEO GAME INDUSTRY IN EUROPE

The final dataset of video game companies georeferenced in European countries by the T2.2 of the **GAME-ER** project allows for an in-depth exploration of the sector's geographic distribution and industrial composition. In the following sections, an illustration of key stylized facts and patterns is provided.

3.1 The European geo-referenced video game companies database: key figures

The final dataset of European video game companies consists of 4,067 firms, of which 1,612 active in the period 2020-2024. The companies included in the final dataset account for a total number of 64,238 games, of which 53,064 are original game titles excluding add-ons, published and marketed across several platforms between 2000 and 2024. Table 9 reports the distribution of the 4,067 video game companies across the European countries analysed alongside the main MobyGames metrics constructed by the T2.2 of the **GAME-ER** project.

Table 9. Distribution of companies, games and key figures per country

Country	N. companies	N. active companies (2020-2024)	N. games	N. games excluding add-on	Avg. Moby Score	Avg. Collected By	Avg. People Credited
UK	1470	405	26086	20986	4,5	24,9	2173,8
Germany	496	173	8384	7566	4,3	20,6	2819,5
France	419	190	9932	7553	4,4	25,3	4999,0
Poland	345	221	5889	4993	3,9	18,5	2993,1
Sweden	240	126	2999	2122	4,4	26,1	3682,5
Spain	239	139	2360	2254	3,8	17,1	2253,4
Netherlands	174	61	2209	1869	3,9	20,7	2623,3
Finland	108	44	568	515	4,6	21,5	533,3
Italy	108	48	1131	1040	4,1	16,4	2107,1
Denmark	82	30	690	620	4,4	20,4	877,2
Czech Republic	66	27	1291	1158	4,2	19,3	5955,4
Norway	37	21	178	151	4,1	16,3	1182,4
Portugal	37	14	576	521	3,8	13,7	1776,3
Belgium	35	20	287	254	3,8	28,3	917,2
Austria	32	11	394	376	4,1	21,9	1130,9
Switzerland	25	12	117	99	5,3	25,7	292,4
Romania	23	9	171	167	3,2	11,1	7536,5
Hungary	21	4	221	130	3,9	16,6	706,9
Lithuania	17	7	213	209	4,6	22,5	2556,1
Ireland	16	7	116	112	4,8	36,0	4698,5
Bulgaria	15	9	77	75	5,2	15,1	1810,8
Slovakia	14	4	86	80	4,3	7,2	171,0
Croatia	13	9	68	58	3,2	13,9	223,1
Estonia	11	8	32	32	2,9	16,7	1659,2
Cyprus	7	6	125	86	2,6	13,6	581,8
Slovenia	6	1	13	13	4,7	8,6	210,5
Greece	4	1	4	4	0,0	2,0	66,0
Iceland	3	2	7	7	3,6	37,1	107,0
Malta	2	1	8	8	6,5	116,0	2569,0
Luxembourg	1	1	5	5	2,8	7,2	36,0
Latvia	1	1	1	1	0,0	2,0	103,0
TOTAL	4067	1612	64238	53064	4,3	22,4	2666,8

Notes: The table reports the distribution across European countries of the 4,067 video game companies identified in the second, and final, step of the GAME-ER T2.2 database construction process along with their main key figures. GAME-ER elaboration. “Moby Score” metric (ranging from 1 to 10) represents a Bayesian average of professional critic and user ratings recorded in the MobyGames website; “Collected by” metric is the number of MobyGames users who have added a game in their account’s collection.

To account for the evolution of the European videogame sector over time, T2.2 defined each company's operational timeline by considering the year of its first and last game release and constructing five-year periods as unit of observation from 2000 onward. Based on this methodology, the industry's temporal evolution was then examined across six distinct time intervals: pre-1999, 2000-2004, 2005-2009, 2010-2014, 2015-2019, and 2020-2024. Table 10 reports the distribution of active companies per period across the European countries analysed.

Table 10. Distribution of active companies across European countries per period of analysis

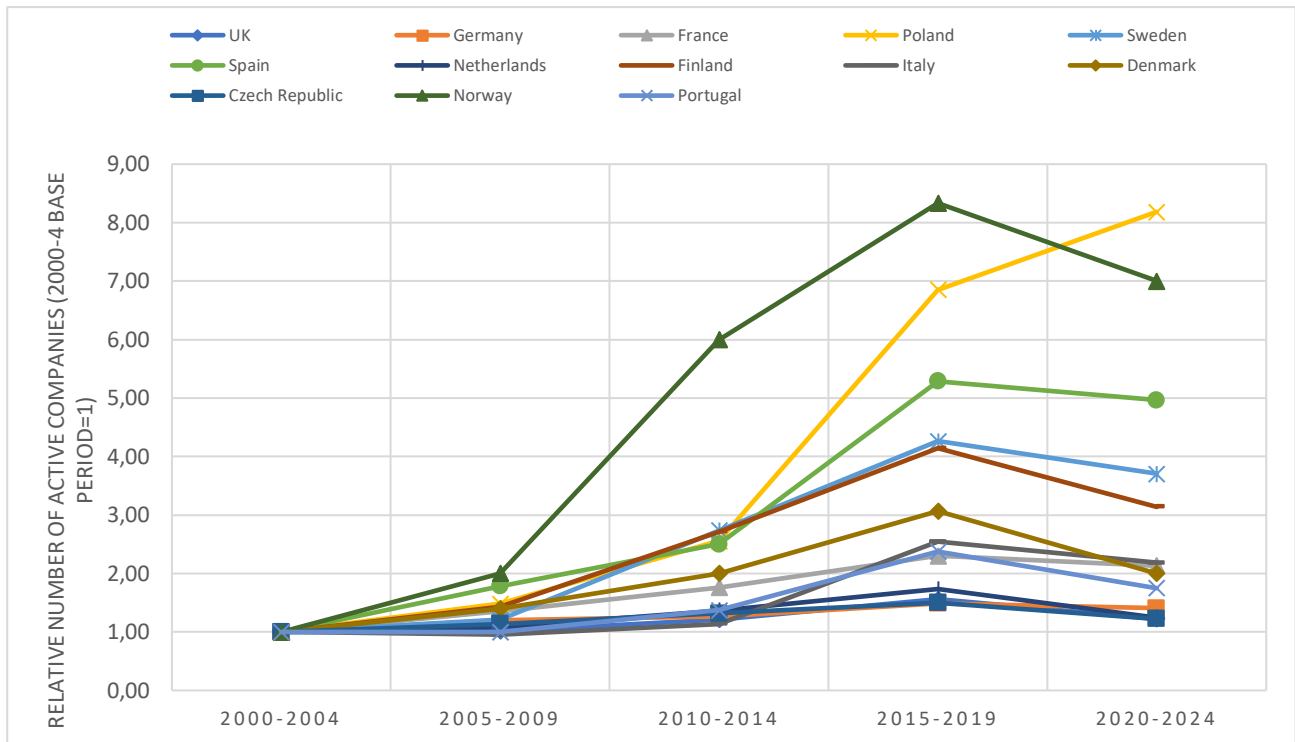
Country	pre-1999	2000-2004	2005-2009	2010-2014	2015-2019	2020-2024
UK	581	330	336	400	515	405
Germany	142	123	147	156	183	173
France	73	89	120	157	205	190
Poland	23	27	40	69	185	221
Sweden	21	34	41	93	145	126
Spain	23	28	50	70	148	139
Netherlands	35	49	53	67	85	61
Finland	5	14	20	38	58	44
Italy	17	22	21	25	56	48
Denmark	14	15	21	30	46	30
Czech Republic	15	22	25	29	33	27
Norway	4	3	6	18	25	21
Portugal	6	8	8	11	19	14
Belgium	10	9	10	9	20	20
Austria	2	6	8	14	20	11
Switzerland	3	4	5	6	10	12
Romania	1	1	4	3	17	9
Hungary	5	5	8	11	10	4
Lithuania	0	2	4	5	10	7
Ireland	0	1	0	2	9	7
Bulgaria	0	2	2	4	8	9
Slovakia	2	5	5	3	3	4
Croatia	0	0	0	0	9	9
Estonia	0	0	0	1	4	8

Cyprus	1	1	1	2	5	6
Slovenia	0	1	2	4	2	1
Greece	0	0	0	0	3	1
Iceland	0	0	0	0	3	2
Malta	0	0	0	1	1	1
Luxembourg	0	0	0	0	1	1
Latvia	0	0	0	0	0	1
TOTAL	983	801	937	1228	1838	1612

Notes: The table reports, for each European country included in the present study, the number of active video game companies across the six periods identified. GAME-ER project elaboration.

Considering the past twenty years, Figure 8 illustrates the temporal evolution in the number of active companies within the European video game landscape for some selected countries. Overall, the data illustrates an expansion of the industry in Europe. However, the observed decrease in the number of active companies, except for Poland, during the most recent period (2020-2024), compared to previous one (2015-2019), may signal a potential contraction of the video game sector, possibly linked to the economic and operational impacts of the COVID-19 pandemic. However, it may be equally plausible that this decline reflects a reporting bias in the MobyGames database, as there may be a time lag in documenting more recent companies and game releases.

Figure 8. Temporal trend in the number of active videogame companies in selected countries (number of companies in each country in period 2000-04 used as a baseline and set to 1)



Notes: the above figure reports the evolution of the number of active video game companies in the major European countries and GAME-ER partners in relative terms. The number of companies in period 2000-04 is set as baseline and equal to 1. GAME-ER project elaboration.

To explore the patterns of videogame first release according to the type of gaming platform, nine distinct platform categories were created to aggregate and organise the highly heterogeneous and detailed platform from MobyGames. Specifically, the 323 individual platforms and video game hardware types listed on the website were consolidated into the following categories: “Arcade machine”, “Browser-based”, “Computer”, “Console”, “IOs”, “Mobile”, “Other mobile”,¹⁴ “Portable consoles”, “Virtual Reality” (“VR”). The aggregation of the platforms listed in MobyGames has been conducted based on the description provided on the web repository. When such information was not available, unclear, or incomplete, a web search of the platform was performed by T2.2 members and subsequently validated by the other GAME-ER partners.

Table 11 presents the total number of video game titles produced by the active companies between 2020 and 2024 in the European countries analyzed, along with the percentage distribution across platform categories. In aggregate, 60% of games were released for PC/computer, followed by Console and Portable Consoles (31% in total) and iOS (4,1%). The table also highlights some differences in the patterns of platform specialisation. at the country level. For instance, companies

¹⁴ The platform category “Other mobile” refers to mobile phones prior to the introduction of app-based ecosystems.

in countries with a more mature videogame industry (such as UK, France, Germany, Spain) tend to have a more balanced mix of specialization in both computer games and console games (considering both classical consoles and portable ones). At the same time, companies based in Finland, Romania, or Croatia have a relatively higher proportion of games published in iOS and mobile respectively.

Table 11. Distribution of active companies' games across European countries and platforms (as a percentage of total number of games)

Country	N. games	% Computer	% Console	% Portable consoles	% Arcade machine	% Browser based	% iOS	% Mobile	% Other mobile	% VR
UK	15120	48,1	37,2	5,9	1,3	1,4	3,8	1,7	0,5	0,1
France	7823	59,6	22,4	6,1	0,9	1,2	5,0	1,5	3,4	0,0
Germany	5790	66,2	19,4	10,5	0,8	0,3	1,6	0,8	0,3	0,0
Poland	4988	80,1	12,1	0,8	0,9	0,2	3,2	2,2	0,4	0,2
Sweden	2112	75,9	13,4	0,8	0,8	0,9	4,1	3,5	0,4	0,2
Spain	1825	61,4	22,4	4,4	0,2	0,6	5,8	3,3	1,8	0,2
Netherlands	1237	59,2	21,1	9,1	0,2	1,4	6,4	2,3	0,1	0,3
Czech Republic	636	89,3	3,1	1,6	0,0	1,1	2,8	1,7	0,3	0,0
Italy	458	77,3	11,6	4,1	0,2	0,7	3,9	1,5	0,7	0,0
Denmark	442	51,8	11,8	4,1	0,0	20,4	9,3	2,0	0,5	0,2
Portugal	441	78,9	9,5	0,0	0,0	0,2	5,4	5,9	0,0	0,0
Finland	345	64,1	7,2	2,0	0,3	2,0	14,5	5,8	4,1	0,0
Lithuania	158	67,7	12,7	7,6	0,0	0,6	10,1	1,3	0,0	0,0
Belgium	145	72,4	13,1	2,1	1,4	1,4	6,2	2,8	0,0	0,7
Norway	143	79,0	6,3	5,6	1,4	0,7	4,9	2,1	0,0	0,0
Hungary	133	83,5	6,0	0,8	0,0	0,0	8,3	0,8	0,0	0,8
Romania	129	39,5	16,3	3,1	0,0	0,8	24,0	6,2	10,1	0,0
Cyprus	121	71,1	2,5	0,0	0,0	0,0	21,5	5,0	0,0	0,0
Ireland	100	85,0	9,0	0,0	0,0	1,0	5,0	0,0	0,0	0,0
Switzerland	87	77,0	16,1	2,3	0,0	0,0	4,6	0,0	0,0	0,0
Austria	85	61,2	17,6	11,8	0,0	1,2	4,7	3,5	0,0	0,0
Slovakia	57	22,8	50,9	21,1	0,0	0,0	1,8	3,5	0,0	0,0
Croatia	55	80,0	3,6	0,0	0,0	0,0	3,6	10,9	0,0	1,8
Bulgaria	40	77,5	5,0	0,0	0,0	0,0	12,5	5,0	0,0	0,0
Estonia	30	73,3	10,0	0,0	0,0	0,0	6,7	6,7	3,3	0,0
Iceland	5	80,0	0,0	0,0	0,0	20,0	0,0	0,0	0,0	0,0

Luxembourg	5	40,0	20,0	0,0	20,0	0,0	20,0	0,0	0,0	0,0
Malta	2	100,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Greece	1	100,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Latvia	1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	100,0	0,0
Slovenia	1	100,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
TOTAL	42515	60,8	24,5	5,5	0,9	1,2	4,1	1,9	1,1	0,1

Notes: The table above reports the total number of active companies' video game titles produced across the European countries analysed, along with the percentage distribution across platform categories. GAME-ER project T2.2 elaboration.

In addition, the comprehensive information provided by MobyGames also enabled the identification of the primary role of each company within the video game production and value chain. This was made possible thanks to MobyGames' detailed reporting of the information on the role played by each company appearing in the credits of each game.¹⁵ More specifically, T2.2 assigned a new aggregate role defined using the relative frequency of each company's involvement in one of the three following key functional areas: development, publishing, and other roles.¹⁶ These proportions were calculated for each company's percentages of the three key areas, respectively. The classification followed a threshold-based approach on the frequencies calculated according to the dominant area of activity:

- **Developer:** assigned when the company acted as a developer in at least 60% of its credited appearances.
- **Publisher:** assigned when publishing accounted for 60% or more of its roles.
- **Integrated:** applied to companies showing a relatively balanced involvement in both development and publishing, specifically when both the relative percentages of developer and publisher roles fell between 40% and 60%.
- **Complementary Services:** assigned if the share of activities outside development and publishing (e.g., distribution, music, additional graphics, porting, testing etc.) exceeded 60%.
- **Diversified:** used as a residual category for companies not falling under any of the above conditions (i.e. those with no clear specialisation or balanced role in the value chain).

¹⁵ Along with the roles of developer and publisher, MobyGames also tracks whether the company has provided additional graphics and development services, design, sound, graphic or game engine, etc.

¹⁶ To maintain analytical clarity, the T2.2 of the GAME-ER project assigned the numerous but rather specialistic roles that are outside development or publishing – such as game and platform design, music and graphics, or game engine – to this third macro functional area.

Table 12 reports the distribution of the 1,612 active European companies across main functional roles across the countries analysed. On average, 36,5% of companies across Europe are primarily developers, with some countries, such as Croatia (55,6%), exhibiting even stronger developer dominance that suggests a strong focus on game creation rather than publishing. While the overall share of publishers is 13,9%, some countries in the **GAME-ER** dataset stand out for the absence of pure publishers, such as Croatia, Hungary, and Romania, suggesting less articulated video game sectors, possibly reflecting more limited local publishing infrastructure or a reliance on external publishers.

Focusing on large and more established markets, Table 12 suggests diverse articulation of the national video game sectors. The United Kingdom shows a varied and relatively balanced sector with 32,8% developers, 14,6% of publishers, 24,9% integrated companies, 8,9% of diversified companies, and a large proportion of complementary services firms accounting for 18,5%. This profile reflects both specialization and vertical integration. Poland, instead, has one of the highest shares of integrated firms among larger markets (29,9%), underscoring its fast-growing industry. France sees developers as the largest group (40%), but also a notable 16,3% in complementary services, indicating a broader ecosystem beyond core game development.

Table 12. Distribution of active companies across European countries by main roles in the video game value chain

Country	N. Companies	% Developer	% Publisher	% Integrated	% Diversified	% Complementary Services
UK	405	32,8	14,6	24,9	8,9	18,5
Poland	221	35,3	19,5	29,9	5,9	9,5
France	190	40,0	13,2	20,0	10,0	16,3
Germany	173	38,2	15,6	22,0	9,8	13,9
Spain	139	41,7	12,2	27,3	5,8	12,2
Sweden	126	36,5	12,7	33,3	7,9	9,5
Netherlands	61	32,8	13,1	39,3	6,6	8,2
Italy	48	39,6	14,6	22,9	12,5	10,4
Finland	44	34,1	11,4	45,5	6,8	2,3
Denmark	30	40,0	13,3	33,3	6,7	6,7
Czech Republic	27	25,9	7,4	40,7	7,4	18,5
Norway	21	47,6	9,5	33,3	4,8	4,8
Belgium	20	35,0	0,0	30,0	10,0	25,0
Portugal	14	35,7	7,1	42,9	7,1	7,1
Switzerland	12	50,0	16,7	33,3	0,0	0,0

Austria	11	54,5	0,0	36,4	0,0	9,1
Bulgaria	9	33,3	0,0	33,3	11,1	22,2
Croatia	9	55,6	0,0	22,2	11,1	11,1
Romania	9	22,2	0,0	44,4	11,1	22,2
Estonia	8	25,0	0,0	62,5	0,0	12,5
Ireland	7	28,6	28,6	0,0	0,0	42,9
Lithuania	7	28,6	14,3	28,6	14,3	14,3
Cyprus	6	0,0	33,3	33,3	0,0	33,3
Hungary	4	75,0	0,0	25,0	0,0	0,0
Slovakia	4	50,0	25,0	0,0	25,0	0,0
Iceland	2	100,0	0,0	0,0	0,0	0,0
Greece	1	0,0	0,0	100,0	0,0	0,0
Luxembourg	1	0,0	0,0	100,0	0,0	0,0
Latvia	1	100,0	0,0	0,0	0,0	0,0
Malta	1	0,0	0,0	100,0	0,0	0,0
Slovenia	1	100,0	0,0	0,0	0,0	0,0
TOTAL	1612	36,5	13,9	27,8	8,0	13,5

Notes: The table above shows the number of active companies across the European countries analysed, along with the percentage distribution across roles. GAME-ER project T2.2 elaboration.

Finally, Table 13 reports the average number of games released per company across different platforms for the 4,067 European video game companies, segmented by their main roles.

Table 13. Average number of games across platforms and company roles

Role	N. Companies	N. Games	Avg. Arcade Machine	Avg. Browser Based	Avg. Computer	Avg. Console	Avg. iOs	Avg. Mobile	Avg. Other mobile	Avg. Portable Consoles	Avg. VR
Developer	1380	7359	0,05	0,05	3,05	1,07	0,29	0,12	0,14	0,56	0,01
Diversified	277	7964	0,89	0,55	16,18	5,81	1,06	0,42	0,41	3,42	0,01
Integrated	979	5356	0,01	0,12	3,62	0,68	0,59	0,24	0,05	0,16	0,01
Complementary Services	593	16715	0,37	0,18	19,58	5,56	0,70	0,37	0,09	1,32	0,02
Publisher	617	26764	0,32	0,32	26,99	11,28	1,10	0,42	0,56	2,37	0,01

Notes: the above table reports the total number of companies and games per main role and the respective average number of games across different release platforms. The data refers to the 4,067 European companies identified in the final dataset of the GAME-ER T2.2.

Overall, the aggregate averages do not reveal strong patterns of platform specialization as every role shows activity across multiple platforms without clear exclusive focus. The Developer category stands out as the largest group, comprising 1,380 companies, yet it shows only modest averages across platforms relative to other company roles. This trend may suggest a fragmented landscape characterized by numerous small game development studios throughout Europe.

In contrast, Publishers, though fewer in number at 617 companies, report significantly higher average game titles, particularly on Computer (26.99) and Console (11.28) platforms. This reflects their larger scale and pivotal role in coordinating and distributing game releases. Integrated companies, while numerous at 979 firms, exhibit much lower averages than publishers across platforms. This suggests that these firms are typically smaller studios engaged in limited self-publishing rather than large, vertically integrated entities. Diversified and Complementary Services firms report high averages on specific platforms, such as Computer and Console, underscoring their involvement in a wide array of projects. However, they too lack evidence of narrow specialization.

3.2 Industrial classification of the video game industry in Europe

The methodology developed by the T2.2 of the **GAME-ER** project also enables the exploration of the European video game sector from an industrial classification perspective. More precisely, the T2.2 used an initial list of 31 NACE Rev.2 codes,¹⁷ deemed most relevant to the video game sector, to perform the country-based searches of video game companies in the Orbis database and retrieve their respective location information. This targeted selection of codes was essential to strike the proper balance between completeness and accuracy of the firms searched and retrieved for data matching purposes.¹⁸

In fact, relying solely on narrowly defined codes – such as, for instance, the 58.21 “Publishing of computer games” or the 59.11 “Motion picture, video and television programme production activities” – would have produced a highly restrictive and incomplete sample of companies. Conversely, attempting to retrieve all companies listed in Orbis without any filtering criteria would have been computationally unfeasible within the project’s constraints. Instead, the use of a curated list of NACE code to restrict the company search allowed for a more manageable and meaningful selection process, which ultimately led T2.2 to match a final sample of 4,067 European companies with their location information.

¹⁷ Reported in Table 3, see Section 2.1.3.

¹⁸ The GAME-ER project T2.2 identified a list of 31 relevant NACE Rev. 2 codes for the video game section by combining various sources of information. In particular, the list of SIC (Standard Industrial Classification) codes reported in the NESTA 2014 report acted as the initial selection. This first selection was then expanded based on a bibliographic search and analysis of policy documents and sectorial reports (see GAME-ER's Task 2.1 and Deliverable 2.1). Finally, the T2.2 complemented and consolidated the final list of NACE codes through Orbis searches and internal cross checks with GAME-ER partners.

To analyse the distribution of the industrial classification codes within this final dataset of European video game companies, T2.2 conducted a second company search on Orbis based on the unique Orbis identifiers (Bureau van Dijk identification codes, or BvD ID codes), verifying and validating their corresponding primary NACE codes. Table 14 presents the aggregate distribution of the primary NACE codes appearing at least twenty times within the final dataset of European geo-referenced video game companies.

The overall distribution of NACE codes retrieved from the second Orbis search reveals a diverse composition of industrial classifications, indicating a high degree of heterogeneity in terms of activities and specializations under which the identified companies operate. As expected, the largest shares of companies are classified under NACE codes 62.01 “Computer programming activities” (34,89%) and 58.21 “Publishing of computer games” (16,11%), followed by 62.02 “Computer consultancy activities” (6,54%), 62.09 “Other information technology and computer service activities” (6,12%), and 58.29 “Other software publishing” (5,26%).

The remaining NACE codes identified, each representing less than 5% of the dataset, reflect a broad spectrum of economic activities. These include, among others, motion picture and television production and post-production (NACE codes 59.11 and 59.12), toy and game manufacturing (32.40), artistic creation and performing arts (90.03 and 90.01), amusement and recreation activities (93.29), and specialised design services (74.10).

Table 14. Distribution of primary NACE codes for the 4,067 European companies identified

NACE Rev.2 Code	Description	Frequency	% Tot. Companies	% Cum.
62.01	Computer programming activities	1419	34,89	34,89
58.21	Publishing of computer games	655	16,11	51,00
62.02	Computer consultancy activities	266	6,54	57,54
62.09	Other information technology and computer service activities	249	6,12	63,66
58.29	Other software publishing	214	5,26	68,92
82.99	Other business support service activities	177	4,35	73,27
59.11	Motion picture, video and television programme production activities	138	3,39	76,66
32.40	Manufacture of games and toys	90	2,21	78,87
73.11	Advertising agencies	76	1,87	80,74
74.10	Specialised design activities	68	1,67	82,41
90.03	Artistic creation	66	1,62	84,03
46.51	Wholesale of computers, computer peripheral equipment and software	54	1,33	85,36

93.29	Other amusement and recreation activities	46	1,13	86,49
59.12	<i>Post-production of film, video production and television programs</i>	45	1,11	87,60
46.90	Non-specialised wholesale trade	41	1,01	88,61
62.00	Computer programming, consultancy and related activities	34	0,84	89,45
62.03	<i>Computer consultancy and computer facilities management activities</i>	29	0,71	90,16
46.49	Wholesale of other household goods	28	0,69	90,85
90.01	Performing arts	25	0,61	91,46
63.11	Data processing, hosting and related activities	23	0,57	92,03
63.12	Web portals	21	0,52	92,55
46.43	Wholesale of electrical household appliances	20	0,49	93,04

Notes: The two codes in italics – specifically, the 59.12 “Post-production of film, video production and television programs” and 62.03 “Computer consultancy and computer facilities management activities” – were not initially included in the list of 31 relevant NACE codes for the video game sector, but were rather found in the second Orbis validation search of the companies in the final dataset.

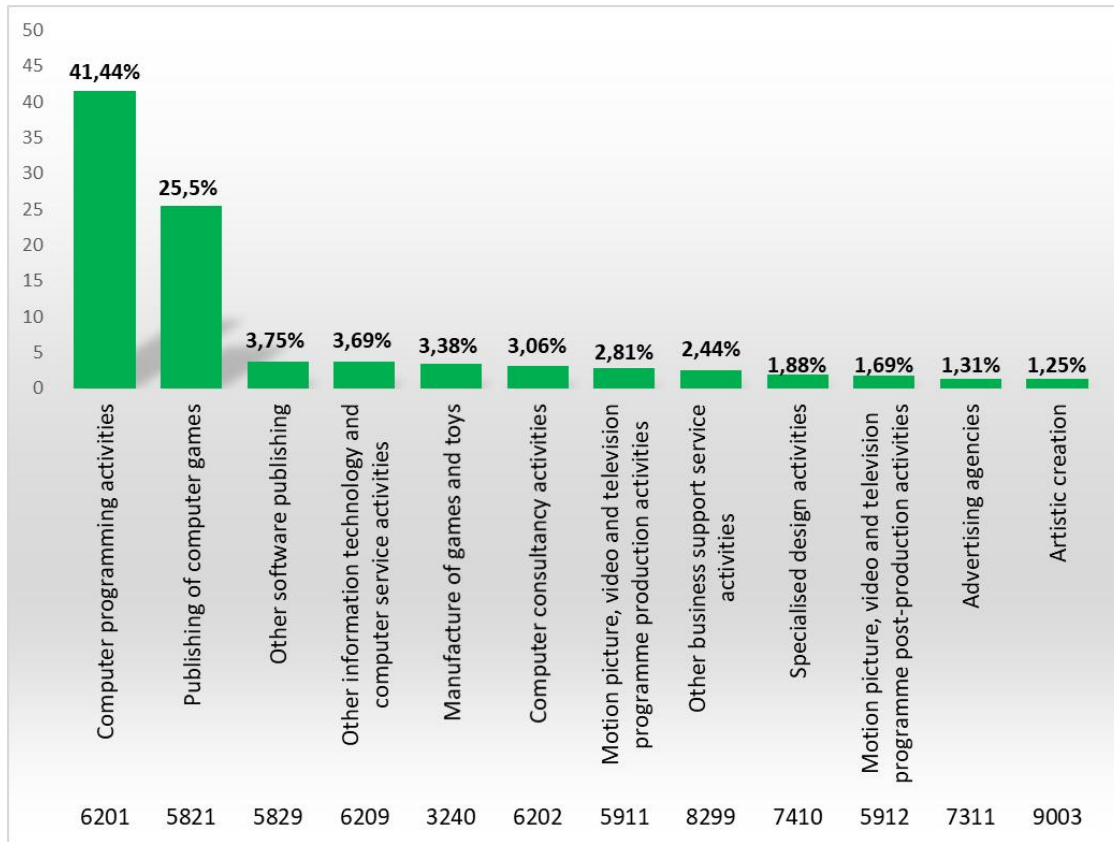
Focusing on the companies that are active in Europe in the period 2020-2024, Figure 9 presents the 12 most frequently occurring NACE codes.¹⁹ Among the active firms, a significant share, 41,44% of the total number active companies, is classified under code 62.01 “Computer programming activities”. This is followed by code 58.21 “Publishing of computer games”, which accounts for 25,50% of the active companies.

Other codes associated with the ICT and software sector, such as 58.29 “Other software publishing”, 62.09 “Other information technology and computer service activities”, and 62.02 “Computer consultancy activities”, as well as code 32.40, “Manufacture of games and toys,” represent smaller proportions, generally ranging between 3% and 3,75%. Additional NACE codes, each representing between 1% and 2% of the dataset, cover other activities related to “Motion picture, video, and television programme production activities” (59.11) and “Motion picture, video, and television programme post-production activities” (59.12), “Other business support service activities” (82.99), “Specialised design activities” (74.10), “Advertising agencies” (73.11), and “Artistic creation” (90.03).

Notably, all 31 NACE codes identified as relevant to the video game sector are represented by at least one company in the dataset. Also, in the case of active companies, the reported NACE codes distribution highlights the heterogeneity of activities within the videogame industry in Europe.

¹⁹ See Appendix for Table 12A for the complete distribution of NACE codes and respective frequencies for the active companies with NACE information identified.

Figure 9. Top 12 most frequent NACE codes per active video game companies



Notes: The histogram displays the 12 most frequent NACE Rev.2 codes, with at least twenty appearances, among the active companies of the final sample identified by T2.2 of the GAME-ER project.

Figure 10 displays the three most frequently occurring NACE Rev. 2 codes for the countries with **GAME-ER** clusters (France, the United Kingdom, Italy, Portugal, and the Czech Republic) as a percentage of the companies active between 2020 and 2024. The figure reveals a substantial overlap between Italy and the UK in terms of their most common primary NACE codes observed, and a good degree of similarity between Portugal and France.

For what concerns Italy and the UK, both countries share the same top three primary NACE codes, meaning 62.01 “Computer programming activities”, 58.21 “Publishing of computer games”, and 62.09 “Other information technology and computer service activities”, while also presenting the same pattern of frequency.

Portugal and France also exhibit notable similarities, with both countries showing 58.21 “Publishing of computer games” and 62.01 “Computer programming activities” as the most frequent codes, though in differing proportions. The main point of divergence lies in the third NACE code: in France, almost 9% of active companies are classified under code 59.11 “Motion picture, video and television programme production activities”, while, in Portugal, approximately 7% are classified under the general code 58.29 “Other software publishing”.

In contrast, the Czech Republic presents a more diverse distribution of primary NACE codes among active firms. In this respect, Czech companies predominantly fall under broader software and ICT categories, specifically with code 58.29 “Other software publishing” and 62.00 “Computer programming, consultancy and related activities”, being the most frequent primary NACE code. Interestingly, code 46.90 “Non-specialised wholesale trade” ranks third for Czech active video game companies, suggesting a stronger orientation towards publishing activities within the Czech video game sector.

Figure 10. Distribution of NACE codes: Top 3 NACE codes by GAME-ER operational partners as % of total active companies in the 2020-2024 period



Notes: The histograms display the top 3 most frequent NACE codes, as a percentage of active companies, per GAME-ER partner country.

3.3 Geographical visualisation

The methodology used in constructing the database, particularly the integration of MobyGames companies with Orbis location data, enables a visual representation of the geographic patterns and trends among the 4,067 European video game firms included in the final dataset.

While the Geographic Information System (GIS) is utilized internally by the **GAME-ER** partners and will feed the Interactive Methodological Toolkit developed in WP5, the following section, for illustrative purpose, report on some key potential applications that can provide a clearer understanding of the distribution and concentration of these companies across Europe, highlighting spatial dynamics and trends within the videogame industry.

3.3.1 *The spatial evolution of the European video game industry*

The identification of distinct periods for the analysis of the European videogame industry provides the opportunity to map both the temporal and geographical distribution of the active companies in each period, thus allowing the exploration of the patterns of firms' emergence and agglomeration.

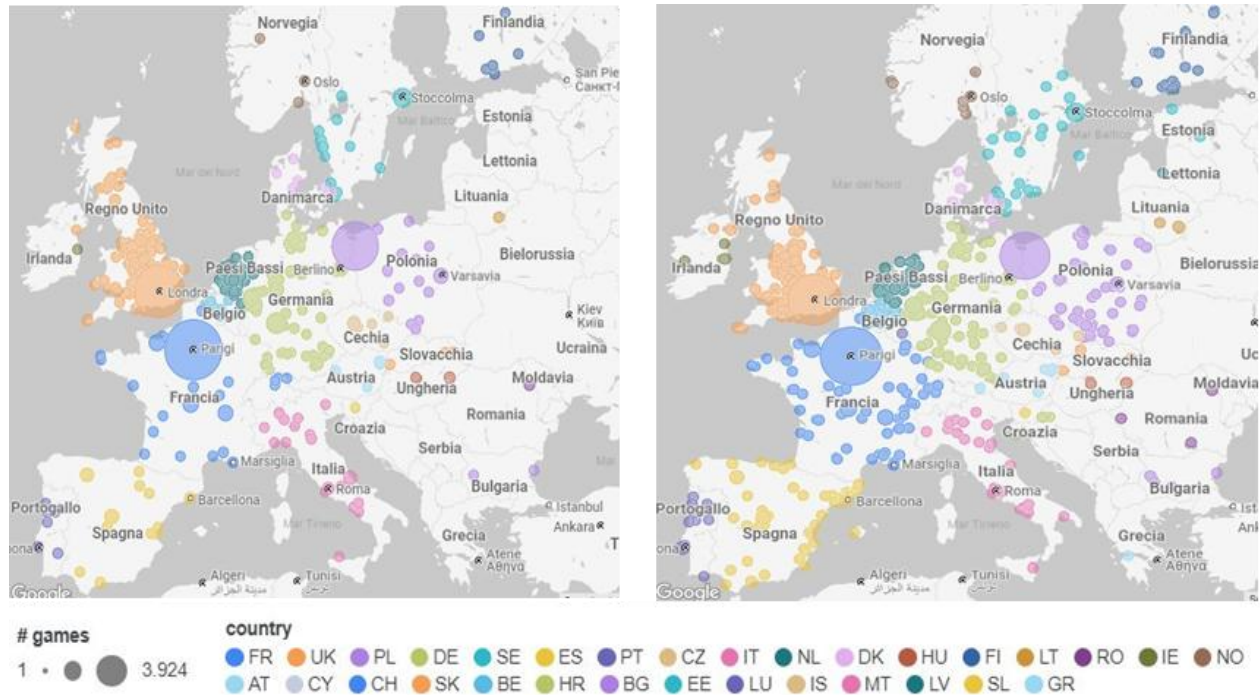
For example, Figure 11 displays the change in the geography of the European video games sector over a twenty-year period, from the early 2000s to the present. More precisely, every point on the map is a video game firm, whose size varies according to the number of video game titles developed or published. Figure 11 (a) shows the distribution of active video game companies between 2000 and 2004, while Figure 11 (b) refers to the 2020-2024 period. Already from the early years of the 2000s, it is possible to observe large and highly productive companies based in major European capitals.

However, over the twenty years analysed, the overall number of active companies grew substantially, rising from 797 in the earliest period to 1,612 in the most recent years. Notably, the emergence of new firms has been especially evident in countries such as Portugal, Spain, France, Germany, Poland, and Sweden.

Figure 11. The geography of the video game industry over time (n. of active companies by number of games)

a. Active companies 2000-2004

b. Active companies 2020-2024



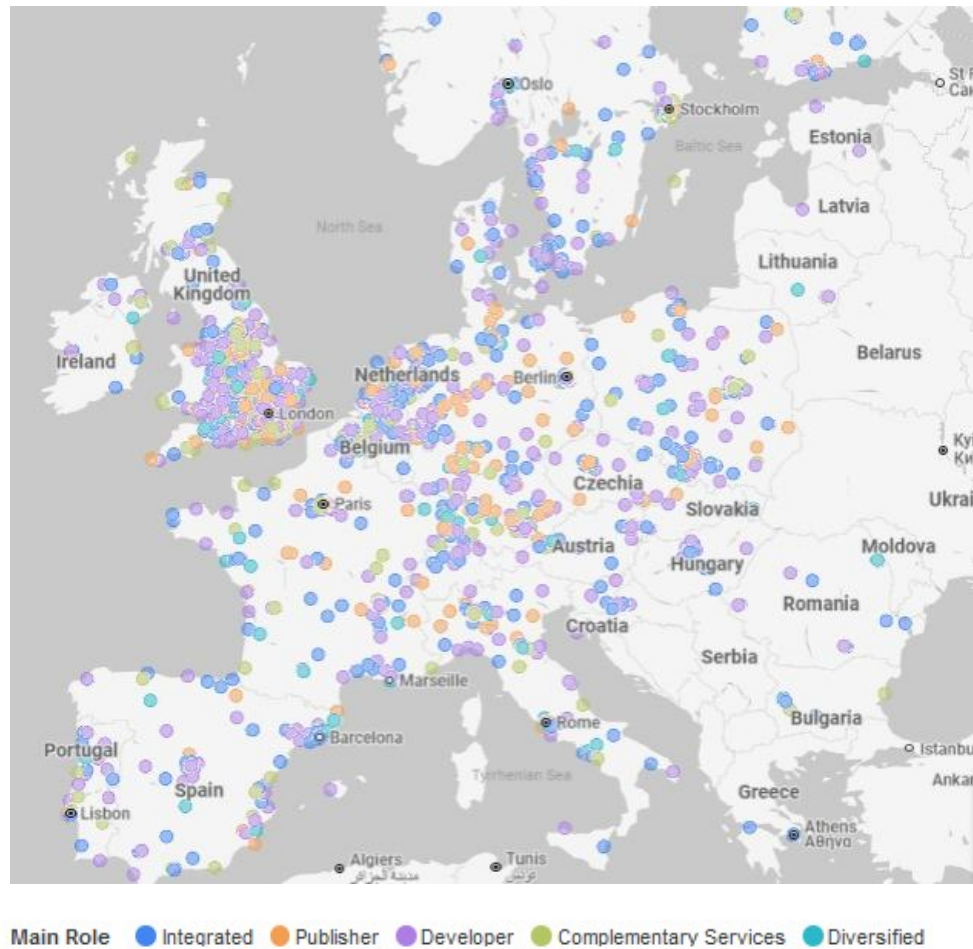
Notes: The figure shows the distribution of active video game companies in Europe during two time periods: 2000-2004 (Figure 9.a) on the left-hand side, and 2020-2024 (Figure 9.b) on the right-hand side. Each dot represents a company, with the size indicating the number of game titles produced. Created by the GAME-ER project using Looker Studio.

3.3.2 Specialisation by role

Leveraging the information about company roles constructed by **GAME-ER** T2.2, (“Developer”, “Publisher”, “Integrated”, “Diversified”, or “Complementary Services”), it is possible to have a glimpse into the spatial organization of the European videogame industry.

Figure 12 shows the geographical distribution of the 4,067 European video game companies localised by the T2.2 according to their primary role.

Figure 12. Distribution of European video game companies by role (all companies)



Notes: The above visualisation shows the distribution of 4067 video game companies across European countries and roles. Created using Looker Studio by the GAME-ER project.

Taking a closer look at the two primary main roles in the videogame production chain, Figure 13 shows the geographical location of both publishers (in orange) and developers (in purple). The geographical visualisation underscores the significant number of developers, who are generally spread evenly across countries, whereas publishers tend to be fewer in number and more concentrated in certain regions.

Figure 13. Number of active developers and publishers

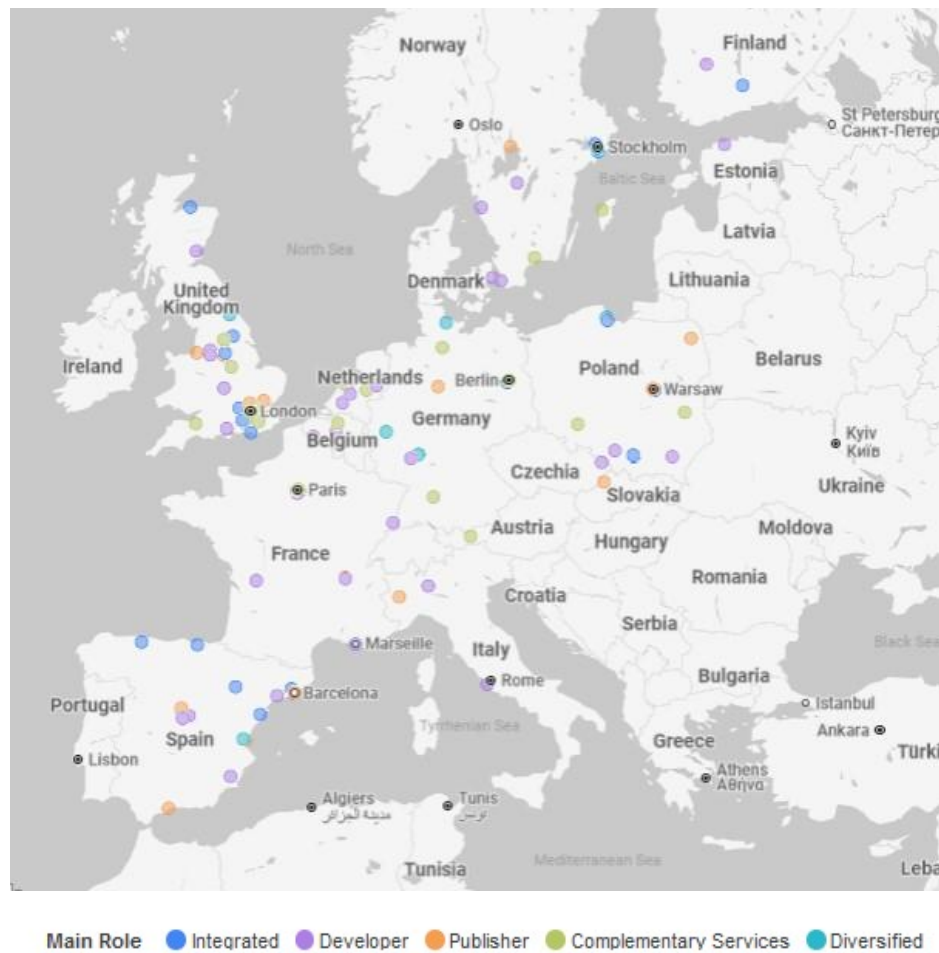


Notes: The above visualisation reports the number of active companies in the period 2020-2024, whose role in the video game production value chain is either publisher (in orange) or developer (in purple). Created by the GAME-ER project using Looker Studio.

3.3.3 Specialisation by platform

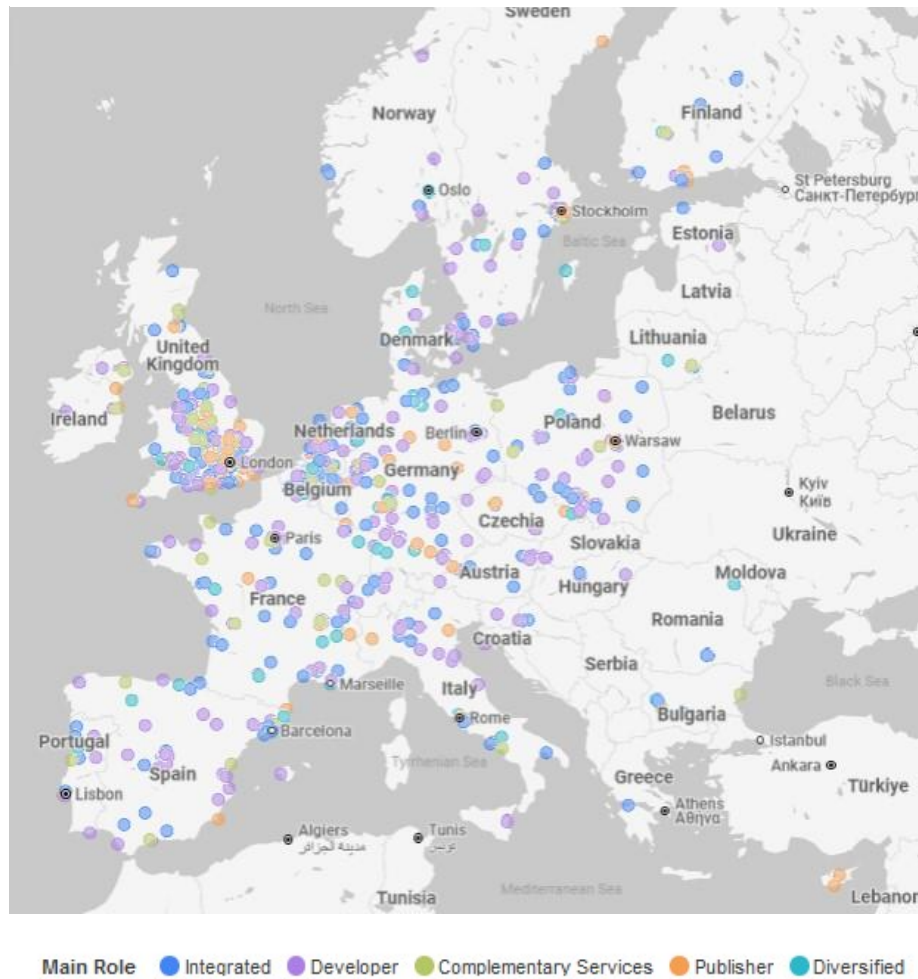
The database construction methodology adopted by GAME-ER's T2.2 also allows for a spatial visualisation of the distribution of companies based on their respective platform specialisation. Figure 14 shows the distribution of companies specialised in Console games across roles, while Figure 15 illustrates the distribution of firms specialised in Computer games in Europe.

Figure 14. Number of active companies (all roles) specialised in Console games



Notes: The above figure reports the companies active between 2020 to 2024 specialised in Console games, for all the roles identified by the GAME-ER T2.2. Created using Looker Studio by the GAME-ER project.

Figure 15. Number of active companies (all roles) specialised in Computer games



Notes: The above figure reports the companies active between 2020 to 2024 specialised in Computer games, for all the roles identified by the GAME-ER T2.2. Created using Looker Studio by the GAME-ER project.

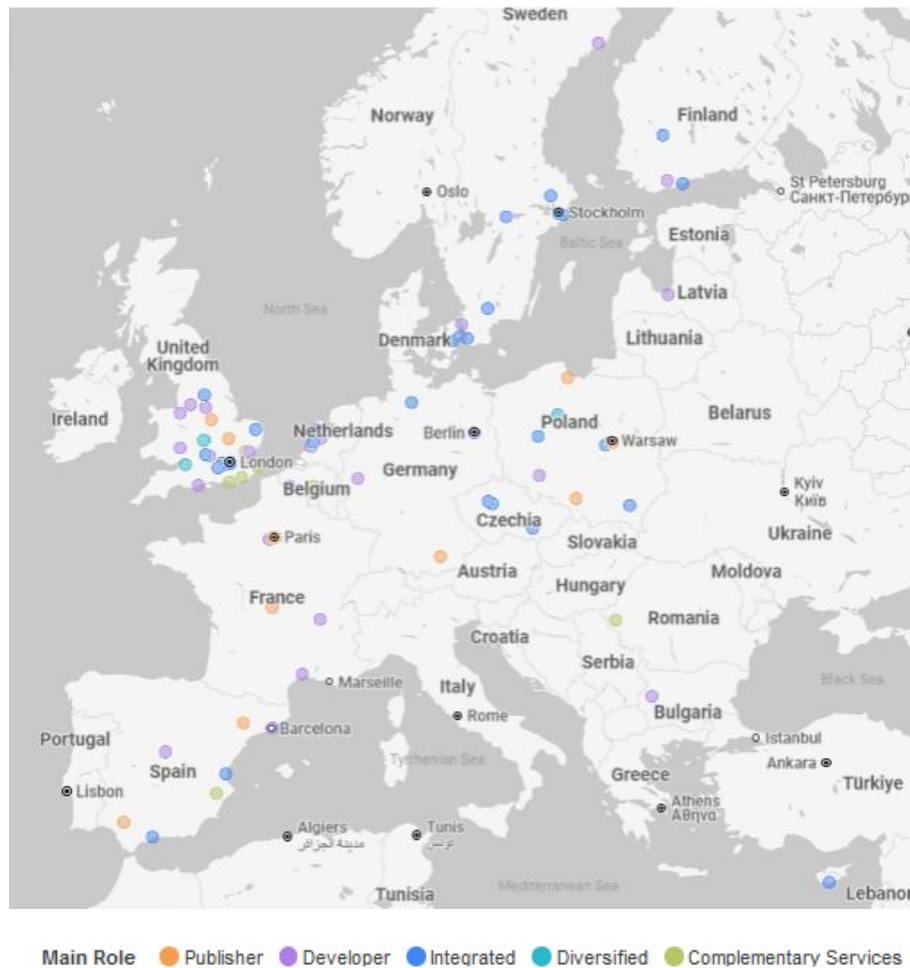
Figures 16 (all companies IOs, mobile, other mobile) and 17 (active mobile, IOs and other mobile) show the European mobile games landscape. Figure 16 reports the distribution across Europe of the complete set of companies whose platform of specialization is either Mobile, IOs, or Other mobile. Figure 17 illustrates the active companies, those that have contributed to the release of at least one Mobile, IOs, or Other mobile game in the 2020-2024 period.

Figure 16. Companies specialized in Mobile, IOs, and Other mobile



Notes: The above figure reports the European companies specialised in Mobile, IOs, and Other mobile games. Each dot is a company, with the size indicating the number of game titles produced. Created using Looker Studio by the GAME-ER project.

Figure 17. Active companies (across roles) specialized in Mobile, Other mobile and iOS



Notes: The above figure reports the companies active between 2020 to 2024 specialised in Mobile, IOs, and Other mobile games, across the roles identified by the GAME-ER T2.2. Created using Looker Studio by the GAME-ER project.

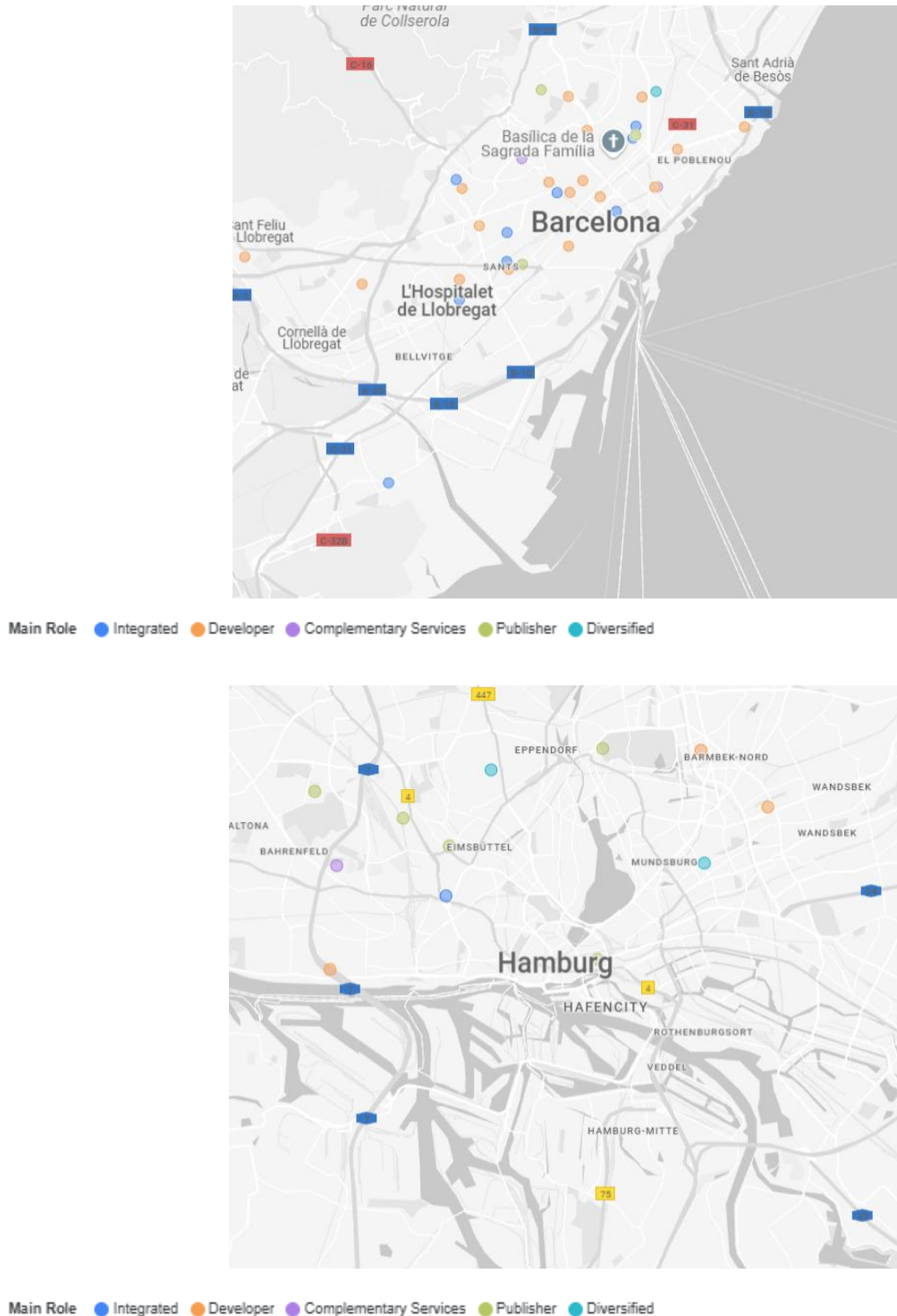
3.3.4 City-level visualisation

The visualisation tool developed within the T2.2 of the **GAME-ER** project provides a powerful means to map and explore the geographic distribution of video game companies across Europe. Beyond a continental or national perspective, the system allows detailed visualisation at the urban scale, enabling the identification of industry hubs not only within cities but also down to the neighbourhood level. This approach makes it possible to highlight the concentration of companies in major European urban centres and to illustrate the localised clustering dynamics of the industry.

By showcasing a few prominent hubs, the tool offers precise visualisations of the spatial distribution of the video game ecosystem, offering several insights into how the sector is structured within metropolitan areas. For example, focusing on the active companies between 2020 and 2024 period,

Figure 18 illustrates the geographical distribution of firms, across main roles, within the same prominent cities.

Figure 18. Location of active video game companies across roles in the cities of Barcelona, Hamburg and Lyon





Notes: The figures reports the localisation of the companies active in the period 2020-2024 in the three major cities of Barcelona, Hamburg and Lyon. Created using Looker Studio by the GAME-ER project.

Considering the **GAME-ER** case studies, the tool allows to specifically focus and map the distribution of video game companies within the video game clusters of Dundee (UK), Lyon and Bordeaux (France), Turin (Italy), Brno (Czech Republic), and Fundão (Portugal).

Figure 19 illustrates the **GAME-ER** cluster areas. While concentration of active companies from the **GAME-ER** database can be found in most GAME-ER case studies, the Fundão area stands out as the only exception. No active video game company is recorded in the Portuguese town itself, except for one single firm identified near the neighbouring city of Covilhã.

These findings underscore the need for a mixed method approach. While the quantitative data-driven mapping approach developed in T2.2 is effective in capturing the emerging **GAME-ER** clusters — particularly in urban centres where firms are likely to have been more established over time — qualitative insights are more effective to uncover emerging videogame entrepreneurial activities in smaller and peripheral contexts — such as in the case of Fundão, where new firms might be recently formed or located.

Figure 19. GAME-ER project clusters, active companies (2020-2024) in the Dundee, Lyon, Bordeaux, Turin, Brno, and Fundão clusters

a. Dundee cluster (UK)

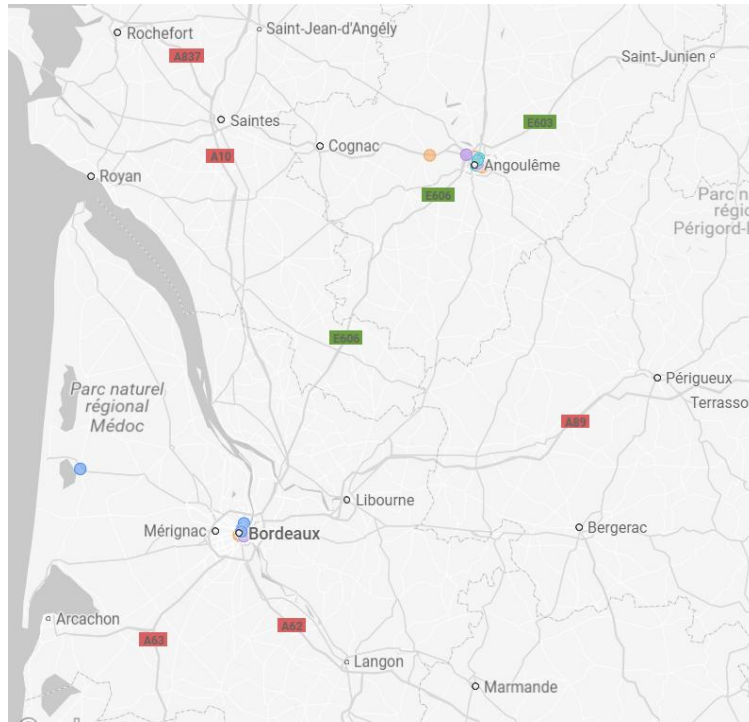


Main Role ● Integrated ● Developer ● Complementary Services ● Publisher ● Diversified

b. Lyon cluster (France)



c. Bordeaux (and Angoulême) cluster (France)



Main Role ● Integrated ● Developer ● Complementary Services ● Publisher ● Diversified

d. Turin cluster (Italy)



Main Role ● Integrated ● Developer ● Complementary Services ● Publisher ● Diversified

e. Brno cluster (Czech Republic)



Main Role ● Integrated ● Developer ● Complementary Services ● Publisher ● Diversified

f. Fundão cluster (Portugal)



Main Role ● Integrated ● Developer ● Complementary Services ● Publisher ● Diversified

4 REGIONAL ANALYSIS

As shown in the preceding sections, the georeferenced database of a spatially representative sample of European video-game companies produced in Task 2.2 offers a granular perspective on the industry's spatial organization. However, the **GAME-ER** project considers the regional scale as the most appropriate unit of analysis for deepening and broadening the economic and industrial understanding of the sector.

Specifically, a regional analysis at NUTS-2 level offers several key advantages:²⁰

- **Integration with official statistics:** NUTS-2 level data is the most granular for which exhaustive, harmonised data is available across Europe (e.g. Eurostat regional accounts, labour market indicators and innovation statistics). Anchoring the analysis at this level ensures a seamless link with complementary socio-economic and demographic datasets.
- **Detection of industry clusters:** using measures of industrial specialization, analysis at NUTS-2 level enables identifying regions with relatively high concentrations of video game development and publishing activity, which serve as proxies for the presence of established or emerging video game clusters.
- **Comparative territorial profiling:** examining the different characteristics and structural dimensions of the sector across regions enables a systematic comparison of production systems and is useful to articulate a classification of specialized regions and their clusters that will be performed in T2.3.

4.1 Dataset and descriptive maps

The regional dataset was derived by systematically aggregating firm-level information into NUTS-2 territorial units, thereby translating individual enterprise data into a regional-scale profile of the European VGI.

Due to the recognized limitations in the Orbis database – particularly concerning turnover and employment (Arndt, 2023) – the analysis draws primarily on MobyGames metrics, which proved to be a second-best but reliable alternative for firm production activity.

²⁰ NUTS-2 (Nomenclature of Territorial Units for Statistics, level 2) is a standardized geocode classification defined by Regulation (EC) No 1059/2003 of the European Parliament and of the Council (as amended) to divide the territory of the European Union into hierarchical statistical regions. It sits midway in the three-level NUTS hierarchy:

- NUTS 1: major socio-economic regions (population 3 million–7 million)
- NUTS-2: basic regions for the application of regional policies (population 800 000–3 million)
- NUTS 3: small regions for specific diagnoses (population 150 000–800 000)

In particular, the selected basic metrics to characterize the regional videogame industry system are:

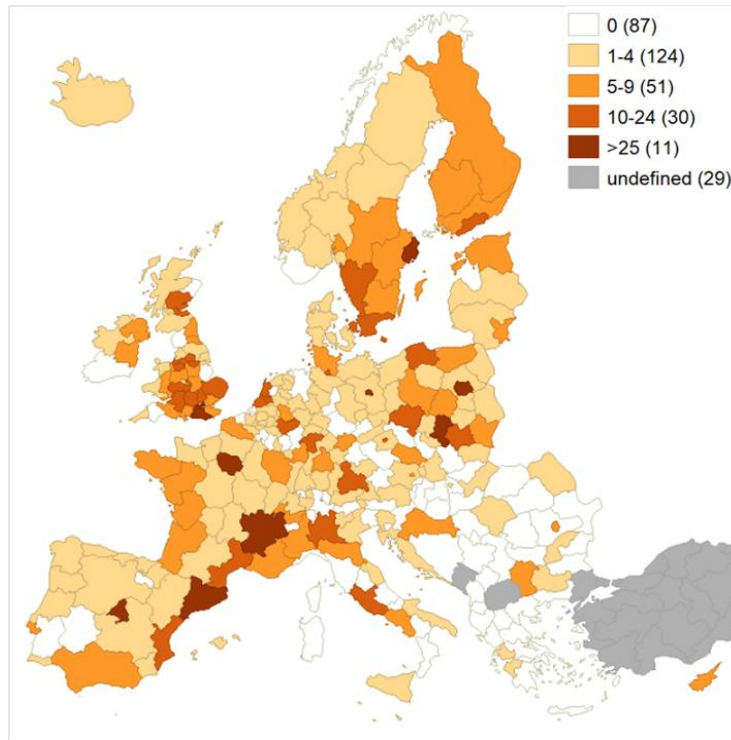
- **Number of companies per region:** this indicator reflects the concentration of industry actors and provides a basic measure of regional sector size.
- **Number of games released per region:** sums all titles published by firms headquartered in the region, serving as a proxy for regional production volume.
- **Number of MobyGames collectors of games released by companies per region:** this metric measures the total count of MobyGames users who have “collected” (i.e., added to their personal library) at least one title released by firms in the region. Since high-profile or AAA titles tend to attract a larger collector base, this indicator functions as an indicator of the market reach and popularity of a region's video-game output.

Figure 20 presents a visual summary of these three key metrics across European regions. The maps reveal a relatively wide presence of the VGI across regions, but with a markedly uneven spatial distribution common in cultural and creative industries (Boix et al., 2012; Cruz and Teixeira, 2021). Notable concentrations are found around large metropolitan areas such as Paris, London, Berlin, Stockholm, Barcelona, as well as Warsaw, Madrid, Prague, and Munich. In contrast, some regions, particularly in Eastern and Southern Europe, including the Balkans, show little to no presence of a video game sector, as indicated by the [GAME-ER Database](#).

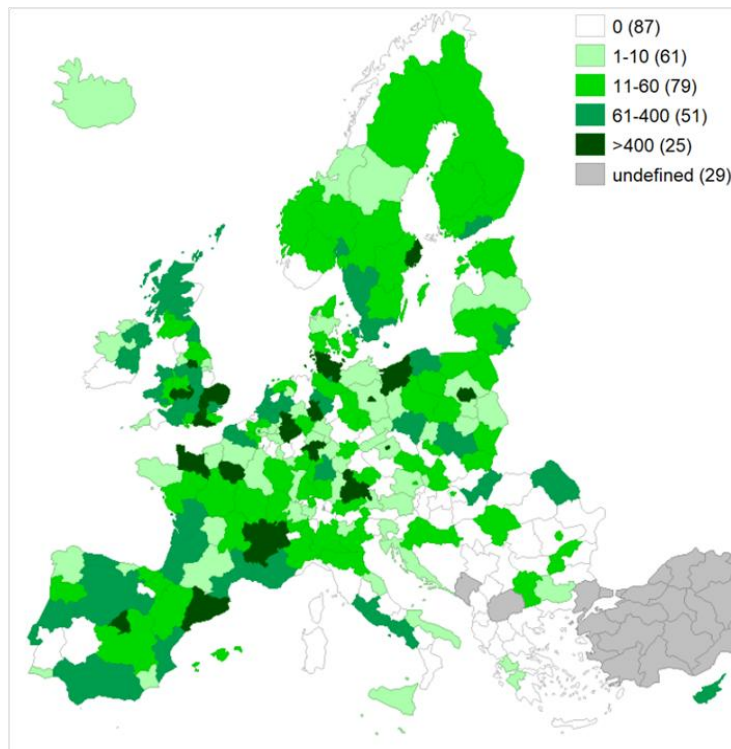
Additionally, it is possible to observe a general positive relationship between the size of the regional industry, the number of games released, and the number of MobyGames collectors. Regions with larger videogame sectors tend to produce a higher number of games and tend to release more commercial or popular titles. This highlights the interconnectedness of industry presence, production capacity, and the popularity of game outputs within the European video game landscape.

Figure 20. Number of companies, games released, and MobyGames collectors per region

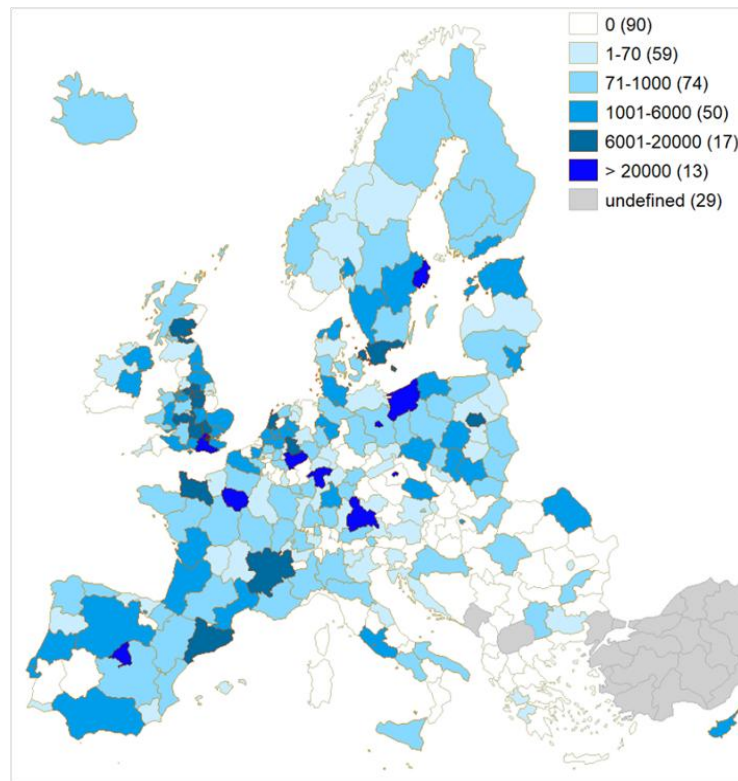
(a) Number of active companies (2020-24)



(b) Number of games of active companies



(c) Number of user collectors of games of active companies



Notes: data refers to active companies (2020-24). GAME-ER project elaboration.

Beyond these core metrics, which can already be utilized to construct more elaborated indicators of videogame production, additional information from MobyGames regarding companies and game data can be leveraged to develop further metrics that will be used to characterize regional video game production systems:

- **Distribution of games released by Platform:** This metric may be useful to identify potential specialization of regional videogame industry systems in specific game platforms (i.e., PC, Consoles, Mobile).
- **Distribution of Company Roles at the Regional Level:** This metric examines the different roles and specializations of companies within a region, highlighting the diverse functions present in local video game ecosystems.²¹
- **Concentration Indices of Regional Systems:** Utilizing metrics such as the number of games released (as a proxy for production) or the number of MobyGames collectors (as a proxy for popularity), this analysis can reveal the degree of concentration within regional video game markets, indicating the presence of dominant players or clusters.

²¹ The classification of companies by roles using MobyGames data has been described in section 3.1

4.1.1 *Measuring regional specialization in the videogame industry*

The **GAME-ER** project leverages quantitative spatial analysis to identify regions specialized in the VGI as a signal of the presence of video game clusters in these areas.

A common approach to study regional specialization of economic activities in economic geography and regional sciences is through the measurement of Location Quotients (LQs) (O'Donoghue and Gleave, 2004; Carrol et al., 2008). A LQ is an analytical statistic that measures a region's industrial specialization relative to a larger geographic unit. The LQ is computed as the region's j share of a given economic activity i (E_{ij}/E_i) divided by the regional share of the economy (E_j/E) for some economic statistic, such as the number of firms or employment, based on the following formula:

$$LQ_{ij} = \frac{E_{ij}}{E_i} / \frac{E_j}{E}$$

Values higher than 1 indicate that an industry is more concentrated in the region than the reference economy, suggesting regional specialization in that sector, while values less than 1 denote lower concentration compared to the economy's average.

Location quotients have been extensively used in the study of the spatial organization of creative industries in Europe (i.e. Lazzeretti et al., 2008; Boix et al., 2012; Bertacchini and Borriore, 2013 Mateos-Garcia and Bakhshi, 2016; Cruz and Teixeira, 2021), mainly using official firms and employment statistics based on NACE codes referring to these types of industries.

The main advantages of using Location Quotients include computational simplicity, low data requirements, and intuitive interpretation – making them accessible for policymakers and researchers seeking to highlight regions with above-average concentrations of specific industries. These are the positive aspects that have prompted the **GAME-ER** project, since its initial proposal, to choose this indicator to study the specialization of regions in the VGI.

However, LQs also have limitations when used to spatially delimit industrial agglomerations, especially compared to more sophisticated spatial analysis techniques, such as spatial clustering algorithms. One key drawback of Location Quotients is their sensitivity to region size (Pominova et al., 2022): in small economic areas, the addition or removal of a single establishment or firm can dramatically skew results, leading to unreliable or misleading indications of specialization. LQs also typically focus on pre-defined administrative boundaries, which may not capture the true spatial extent of clusters that cross borders or depend on inter-industry linkages (Boix et al., 2015). Some of these limitations can be mitigated by combining LQs with complementary approaches. For

example, the sensitivity of LQs to “small regions” can be overcome by selecting a minimum threshold of industry size.²²

Finally, another issue arises from how LQs compare the concentration of an industry in a region to that in a larger reference area, the choice of the base economy – whether national or European – as this can significantly influence both the interpretation and policy relevance of the results. This issue is especially salient for projects like GAME-ER, which seek to analyze the European videogame industry across multiple countries and regions. Using the national level as a benchmark highlights regions that are specialized within a single country, while using the European level reveals how regions stand out across the entire continent.

Both approaches can have both benefits and shortcomings. Using the European scale as the base economy for location quotients is generally more appropriate for comparing regional video game industrial systems across countries, as it allows for the identification of clusters that stand out continent-wide. However, this approach tends to favor regions in countries with more mature national gaming sectors – such as UK, France, Germany, or Poland – and may overlook emerging clusters in countries where the video games industry is less developed, thus potentially underestimating the dynamism of smaller or newer ecosystems. Conversely, applying LQs at the national level addresses this issue by providing a more country-specific perspective, helping to highlight emerging regions within each country’s video games industry.

Since the **GAME-ER** project is interested in emerging clusters, particularly in countries where the sector is still developing or consolidating, using national-level LQs is likely more appropriate to guide the identification of regions with potential clusters. At the same time, European-based LQs can be used as a complementary indicator to better characterize the degree of specialization of regions within a broader continental context, thus offering a more comprehensive and layered understanding of the video game sector dynamics across Europe.

Based on the previous discussion, the **GAME-ER** project will primarily use LQs calculated at the national level according to the following general formula:

$$LQ_{VGj} = \frac{\frac{VG \text{ indicator region } j}{VG \text{ indicator country}}}{\frac{Region \text{ } j \text{ economy}}{Country \text{ economy}}}$$

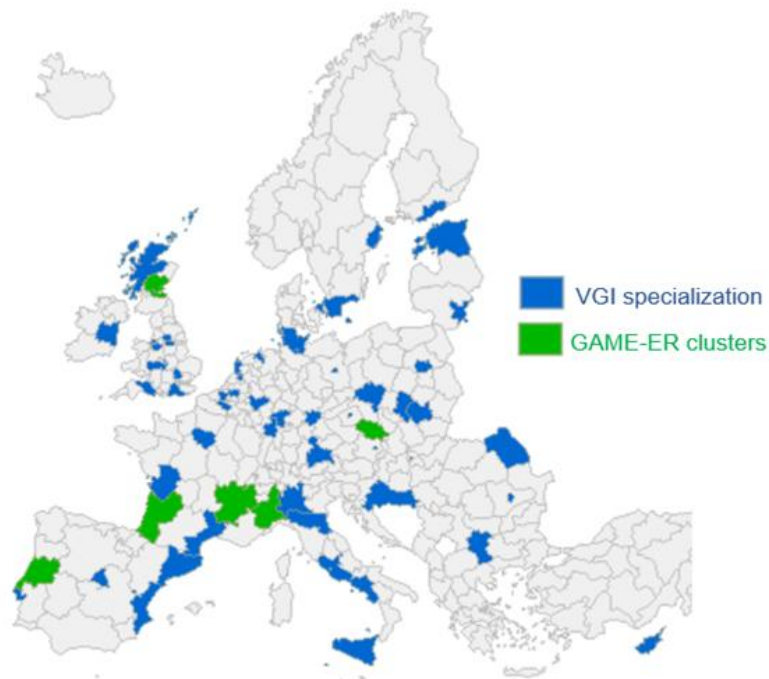
²² By selecting a minimum threshold of industry size, only industries with a substantial number of establishments are included in the LQ calculation, thereby reducing the impact of random fluctuations and providing a more stable and reliable measure of economic specialization.

Given the limitations of ORBIS data, the LQs for the videogame sector will be based on indicators derived from MobyGames data (i.e. number of firms, games released and collected by), which provide proxies of industry size and output. To measure the broader regional and national economy, employment and GDP data is drawn from official European statistics.

4.2 Identification of specialized regions

After a careful evaluation of possible metrics and conditions previously discussed, Task 2.2 of the **GAME-ER** project has defined a set of criteria to identify regions displaying a minimum level of specialization in the VGI. These regions must exhibit LQs greater or equal than 1 for the number of active videogame companies,²³ calculated simultaneously using employment and GDP to measure the economic size of the region. Furthermore, to ensure the robustness of the analysis, only regions with a minimum of three active videogame companies during the period 2020-2024 were considered.²⁴ This method allows **GAME-ER** to focus on and analyse a subset of 62 NUTS-2 regions, which demonstrate both relative specialization and a sufficient critical mass of industry presence. At the same time, the selected regions already incorporate the six regions in which the **GAME-ER** clusters. Figure 21 displays the selected regions.

Figure 21. Selection of European Regions specialized in Videogame industry according to GAME-ER metrics



²³ The location quotient based on the number of videogame companies was chosen as the baseline indicator to measure regions' specialization because, among MobyGames constructed metrics, the number of companies is likely the most reliable and consolidated data available for approximating the regional size of the sector.

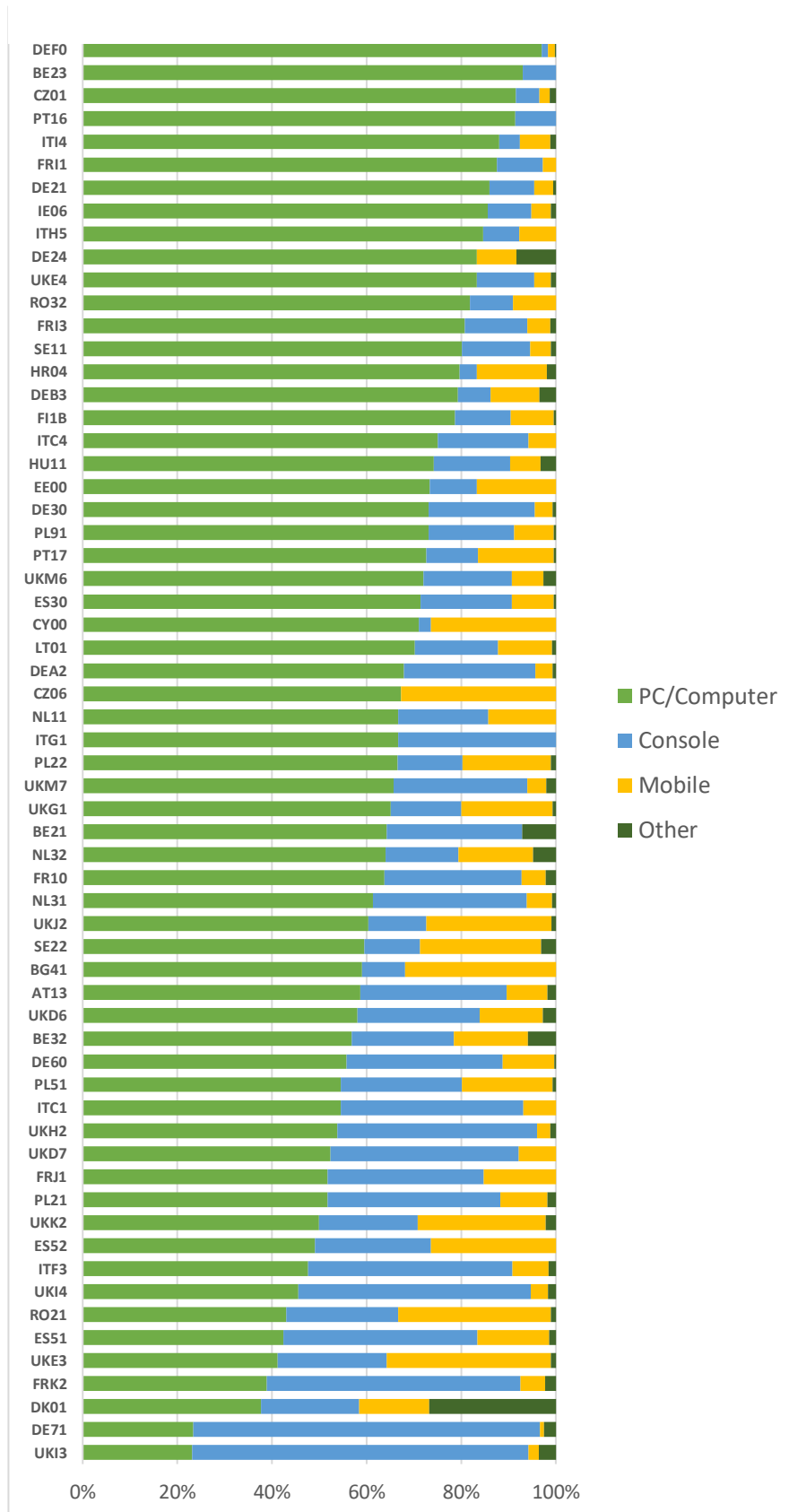
²⁴ The threshold of three active companies was selected as this value is above the median number of active companies per region, equal to 2 companies.

4.2.1 Regional specialization by technology and role in the supply chain

When looking across all 62 European regions identified for their specialization and potential in the VGI, Figure 22 shows the distribution of games released by active companies per region for the different platforms, according to the MobyGames data.²⁵ Distinct platform specialization patterns emerge that help us to understand differences across regions' videogame industry structure.

²⁵ The platform of the first release of the game is used as a proxy.

Figure 22. Platform specialization in companies per region



With an average of 65% of games released per region, PC is the dominant platform. In about half of the regions, PC's share rises above this average—sometimes exceeding **90%** in areas like Centro (Portugal), Praha (Czech Republic), Oost-Vlaanderen (Belgium) and Schleswig-Holstein (Germany). This indicates that many specialized regions maintain focused, PC-driven ecosystems, arguably driven by developers that choose PC for its accessibility, lower development costs, and easier distribution via global digital platforms (e.g., Steam, GOG) (EGDF, 2022, Ozalp, 2024).

With an average of 21% of games released per region, Console is the second most frequent platform. Yet few regions are characterised by companies involved in the release of console-based games. A smaller but significant group of regions stands out for a more balanced mix between PC and console games, showing signs of more mature and diversified production structures. Examples include:

- Inner London - West and Inner London - East (UK), with console shares around 49 and 71%.
- Hessen (Darmstadt, Germany) and Rhône-Alpes (Lyon, France), both with console shares over 70 and 50% respectively.
- Cataluña (Spain), Piemonte (Italy), and Eastern Scotland (Dundee and Edinburgh areas), all showing substantial console contributions, around 30 and 40%.

These regions may represent advanced or emerging ecosystems capable of supporting larger, more resource-intensive console projects. Their diversification suggests improved access to investment, specialized talent, and stronger integration into broader VGI networks.

Mobile gaming development and publishing systems are present in most regions but rarely dominant. Only in a few cases – such as South Yorkshire (UK), Nord-Est (Romania), and Jihovýchod (Czech Republic) – does mobile gaming exceed or approach 30% of the output. Where present, higher shares of mobile game releases by companies may signal strategic efforts to tap into rapidly growing mobile markets, where game development costs and time-to-release are also lower compared to other game platforms. However, they remain limited in scope, suggesting that mobile is still a complementary rather than leading focus in most European specialized regions. Notably, among the selected regions, only Hovedstaden (DK01) shows a balanced distribution across PC, console, and mobile platforms.

Focusing on the regions with clusters of the **GAME-ER** project, data from the quantitative analysis highlights distinct patterns of platform specialization potentially reflecting different strategies and stages of development for each cluster. In Centro (Portugal), it is possible to observe a striking dominance of PC games, accounting for over 91% of all releases, with the remaining share taken by console titles. There is no mobile or other platform activity. This very high concentration suggests a strongly focused and possibly emerging ecosystem, where development efforts concentrate on PC due to its lower barriers to entry and accessible distribution channels.

A similar PC-oriented profile is observed in Jihovýchod (Czech Republic), where PC titles account for approximately 67%. Interestingly, there is also a notable share of mobile games (around 33%), while there appears to be a lack of companies specializing in console games based on initial releases. This suggests a region that, although still heavily focused on PC, is strategically expanding into mobile, potentially reflecting an intention to diversify and access broader markets.

In Piemonte (Italy), the production is more balanced: around 55% of games are first released for PC, while nearly 39% are for consoles, and a small portion (about 7%) for mobile. This more distributed profile may point to a transitional and evolving ecosystem, where companies are moving beyond an exclusive PC focus and gradually building capacity for console-based projects. The presence of mobile games, albeit modest, also indicates some responsiveness to consumer trends and market diversification.

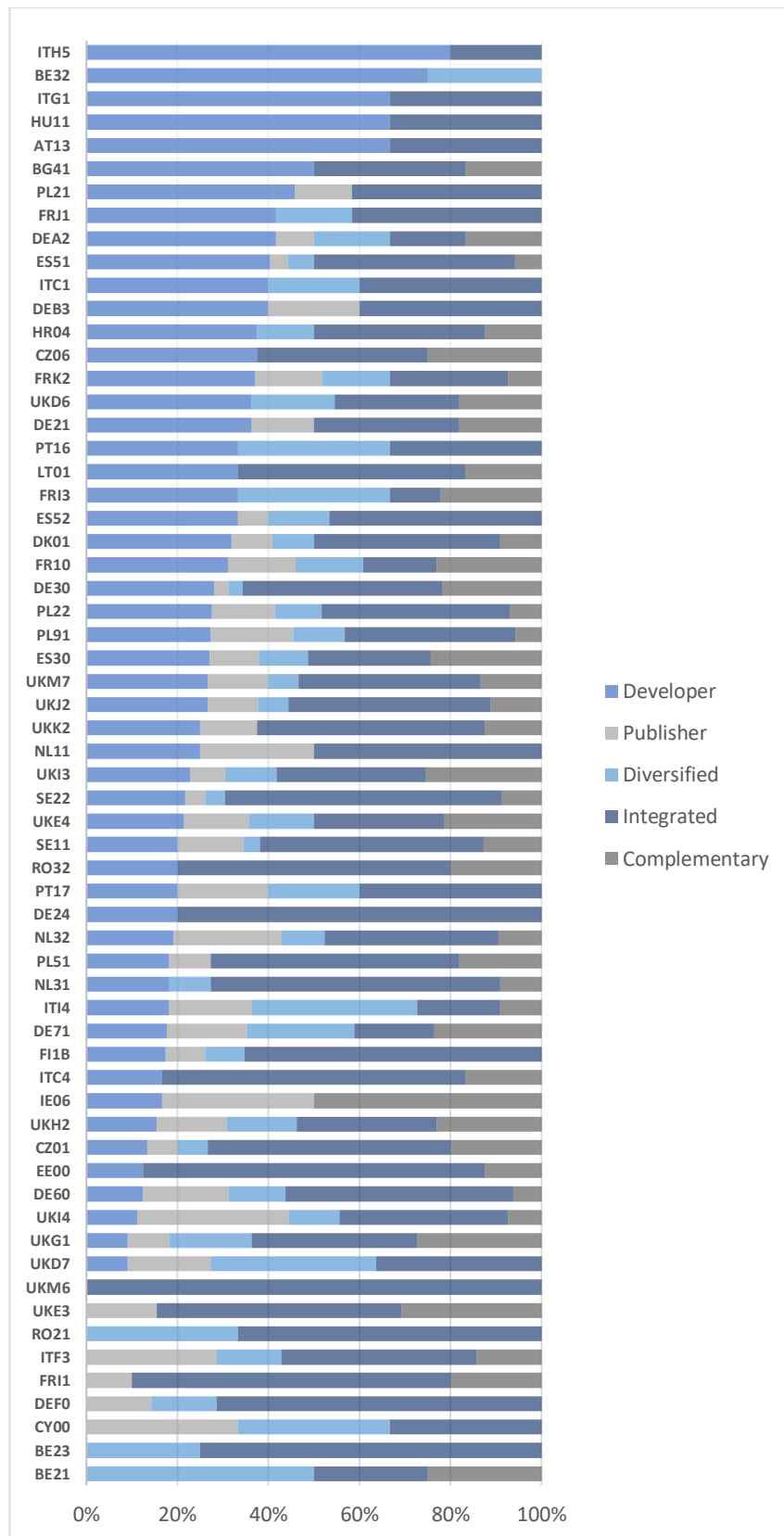
Moving to Eastern Scotland (UK), we see a fairly consolidated and diversified video game industrial system. Approximately 66% of games target PC, while about 28% are console games, and a small fraction (4%) are for mobile. This mix reflects a robust, historically grounded regional sector, likely supported by strong scientific and educational institutions and a tradition of both PC and console development. The moderate diversification suggests local studios are capable of handling multi-platform projects, including larger-scale console titles.

In Aquitaine (Bordeaux, France), the specialization is particularly strong on PC games, which represent around 88% of the total, with only about 10% going to consoles and almost no mobile games. This profile reflects a focused, PC-driven ecosystem, perhaps characterized by studios with strong ties to creative industries, but without significant expansion into mobile or console markets yet.

Finally, in Rhône-Alpes (Lyon, France), the distribution is more balanced: roughly, 39% of releases are PC games, about 54% are console games, and around 5% mobile, with a small remainder classified as "other." This indicates again a consolidated ecosystem, where firms have developed the capacity to produce console games at scale – often requiring more investment and larger teams – alongside PC titles. The presence of mobile games, though smaller, further underscores the region's flexibility and diverse production base.

Focusing instead on the regional distribution of companies according to their role in the videogame value chain (see section 3.1 for classification of company roles), Figure 23 offers further insights into how these local ecosystems function and develop.

Figure 23. Specialization by company role per region



A clear pattern across many regions is the strong predominance of developer-focused companies. In numerous cases – such as Emilia-Romagna, Sicilia, Budapest, and Wien – the share of developers exceeds 60%, sometimes reaching as high as 80%. This signals regions where the focus is clearly on content creation rather than market control. These ecosystems are typically characterized by a few firms, arguably small and medium-sized studios, often independent, that concentrate on game development while relying on external publishers or partners to distribute and promote their products.

Alongside these developer-dominated regions, T2.2 finds a significant group where integrated companies, i.e. those combining both development and publishing functions, play a major role. Generally speaking, in more than 1/2 of the 62 clusters, integrated companies are the most prevalent. In regions like Lombardia, Hamburg, Helsinki, Southern Sweden and Prague, the share of integrated firms exceeds 50%, and in the region of Bordeaux this share reaches 70%. This may suggest a move toward greater strategic autonomy, allowing local companies to retain control over a great part of the value chain, from production to market release. Such structures can be found in more mature ecosystems with stronger access to resources and investment, supporting larger-scale or more complex projects.

In contrast, purely publisher-focused regions are quite rare across Europe. Only a few areas, notably Inner London East, show publisher shares above 30%. This indicates that, unlike in North America or Japan, Europe has comparatively few regions specialized exclusively in publishing, highlighting a broader tendency toward development-centered or integrated business models.

Regions with a significant share of diversified companies, i.e. firms without a single predominant role but active across multiple activities, illustrate another interesting pattern. These hybrid structures appear for instance in regions such as Lazio or Merseyside and may be the result of adaptive strategies where companies take on various roles to remain competitive and resilient, possibly due to smaller market sizes or resource constraints.

Finally, the presence of complementary service providers (such as sound, art, design, or testing specialists) remains relatively modest overall but is more visible in larger hubs like London, Berlin, Île-de-France and Madrid. The emergence of these specialized support firms is an indicator of ecosystem complexity, as it shows the development of a broader industrial value chain beyond core game production.

In this context, it is possible to enrich the analysis of the characteristics of the European clusters in terms of the main role local firms play in the VGI supply chain by comparing for each cluster, the number of companies active in the 2020-2024 period with the share of firms that are mainly publishers, developers, integrated, diversified and complementary service, respectively (Figure 22).

This will allow T2.2 to better characterize the specialization of the different clusters along the VGI supply chain by comparing the share of the local companies in the different roles to the dimension

of the clusters (measured by the number of firms) and relating these characteristics to the European average.

When looking at the share of publishers in Figure 24 (a) compared to the number of firms, many of the clusters fall below the European average line. However, some notable exceptions emerge. Large clusters, in terms of number of firms, such as Warsaw (PL91) and Paris (FR10) show an above the European average share of publishers, while London (Inner London East - UKI3) is instead characterized by a particularly high share of publishers despite having relatively few companies overall. Among the **GAME-ER** clusters, Rhône-Alpes (FRK2) and Dundee (UKM7) place above the average, suggesting a more integrated value chain in those clusters. While Aquitaine (FRI1) is basically along the European average, other **GAME-ER** clusters, such as Piemonte (ITC1), Centro (PT16), and Jihovýchod (CZ06) remain well below the average, reflecting ecosystems predominantly oriented toward development.

Developers (graph b) clearly dominate most ecosystems, with many regions, especially those with smaller numbers of companies, showing shares well above the European average, pointing to highly focused ecosystems, often composed of small studios working purely on game development without additional roles. On the contrary, large VGI clusters such as Warsaw (PL91), Paris (FR10) and London (Inner London East - UKI3) show a share of developers in line with the European average. Among the **GAME-ER** clusters, Rhône-Alpes (FRK2), Centro (PT16), and Jihovýchod (CZ06) stand out for their high shares of developers, confirming their orientation towards production. Eastern Scotland (UKM7), while still above average, displays lower shares of developers.

The third plot (graph c) shows that integrated firms, i.e. those combining development and publishing, are also typical of clusters with a smaller number of firms, while large clusters such as Warsaw (PL91), Paris (FR10) and London (Inner London East - UKI3) show a share of integrated firms below the European average.

Remarkably high shares appear in regions such as UKM6 (United Kingdom), DE24 (Germany), and RO21 (Romania), among others, where integrated firms dominate the local structure. These clusters also display a small number of firms and are arguably characterised by small, developing firms that perform both functions in-house. Among the **GAME-ER** clusters, Aquitaine (FRI1) stands out as the only one near or slightly above the European average, confirming its maturity and strategic capacity for vertical integration.

Finally, diversified firms (graph d) operate across multiple roles or business activities, while complementary services (graph e) provide specific activities such as sound, art, design, or testing specialists. The specialisation patterns of clusters, when examined in relation to the shares of diversified and complementary services firms, closely resemble those observed for integrated firms. In this context, large and highly consolidated hubs such as Warsaw (PL91), Paris (FR10), and Inner London East (UKI3) exhibit relatively low shares of diversified and service-oriented firms.

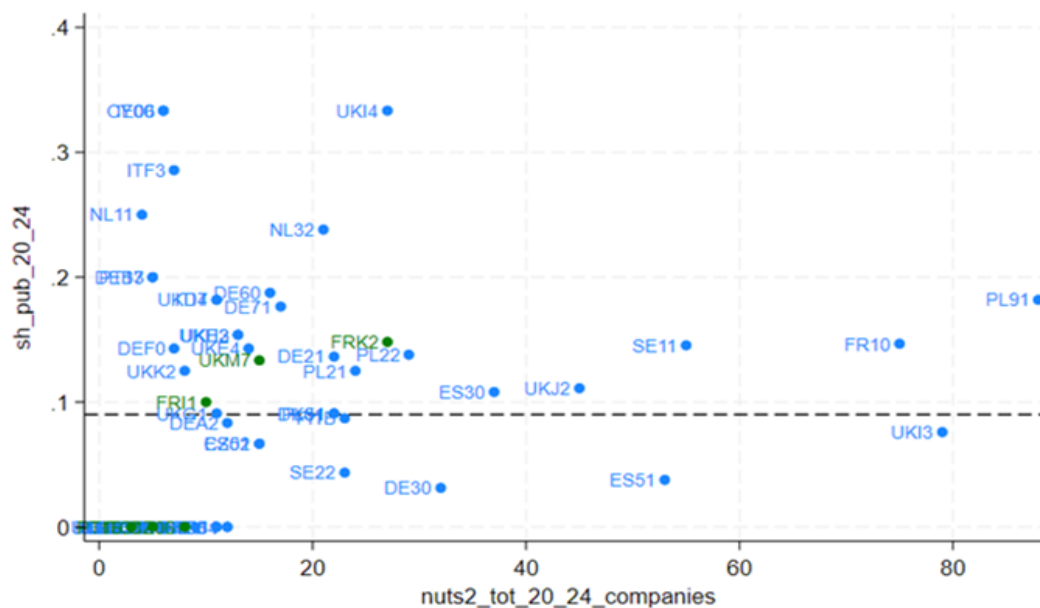
This suggests that in mature and expansive ecosystems, firms tend to focus on specialised roles along the supply chain, allowing for deeper expertise and stronger competitive positioning in specific segments, whether development, publishing, or services.

Conversely, in smaller or emerging ecosystems, companies are often compelled to adopt more diversified business models, combining multiple activities - from development to services and beyond - to ensure their survival and to adapt to the limited availability of local partners, specialised providers or even a local market. This broader scope enables them to maintain flexibility and capture different value opportunities within the industry.

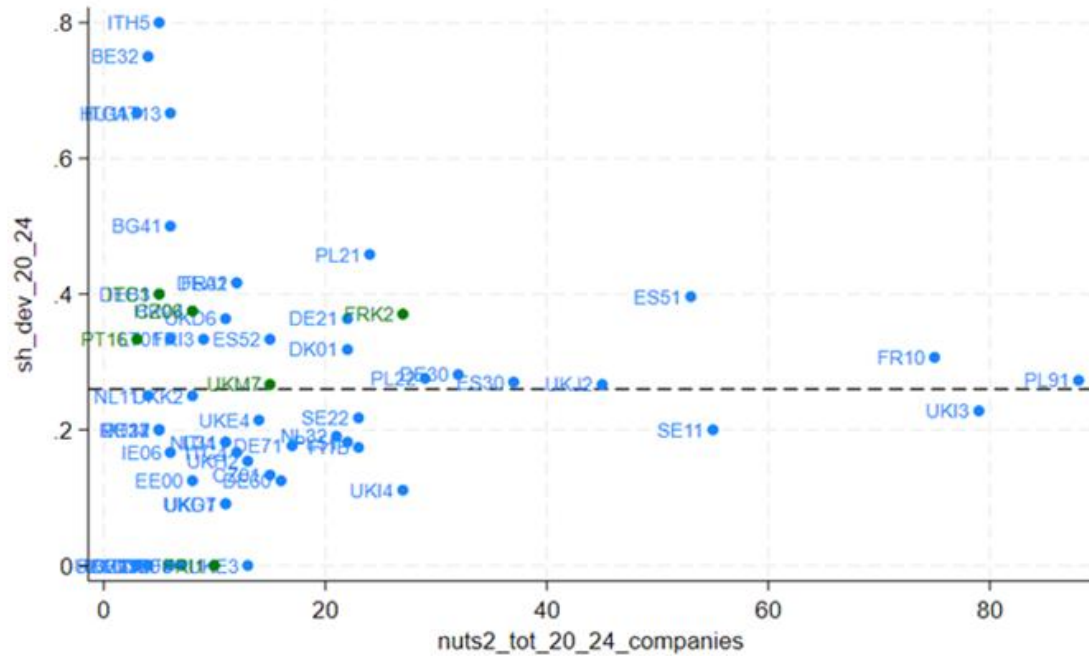
This difference underscores the key role that ecosystem maturity and scale play in shaping firm strategies. Large, well-established clusters with consolidated markets tend to encourage vertical and horizontal specialisation, while smaller ecosystems are conducive to multi-role adaptability and diversification, which in turn fosters the resilience of local industry dynamics. These different and explorative patterns will help us in building a possible classification of European VGI clusters in T2.3.

Figure 24. Number of active companies 2020-2024 (horizontal axis) per share of main role performed by local firms: (vertical axis). Dashed line: European average

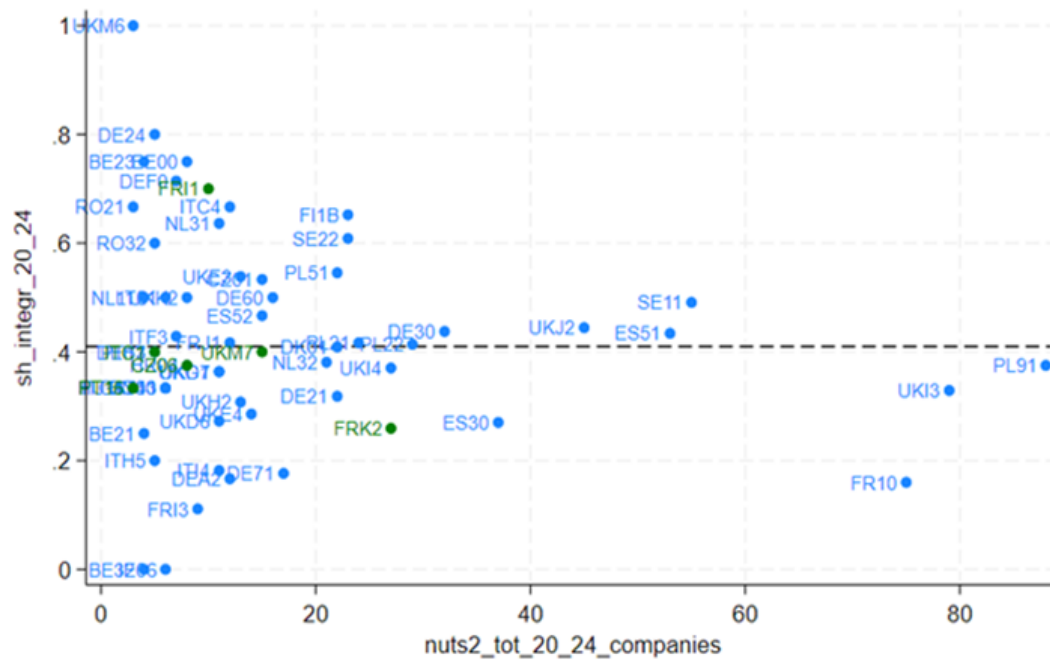
a) Publishers



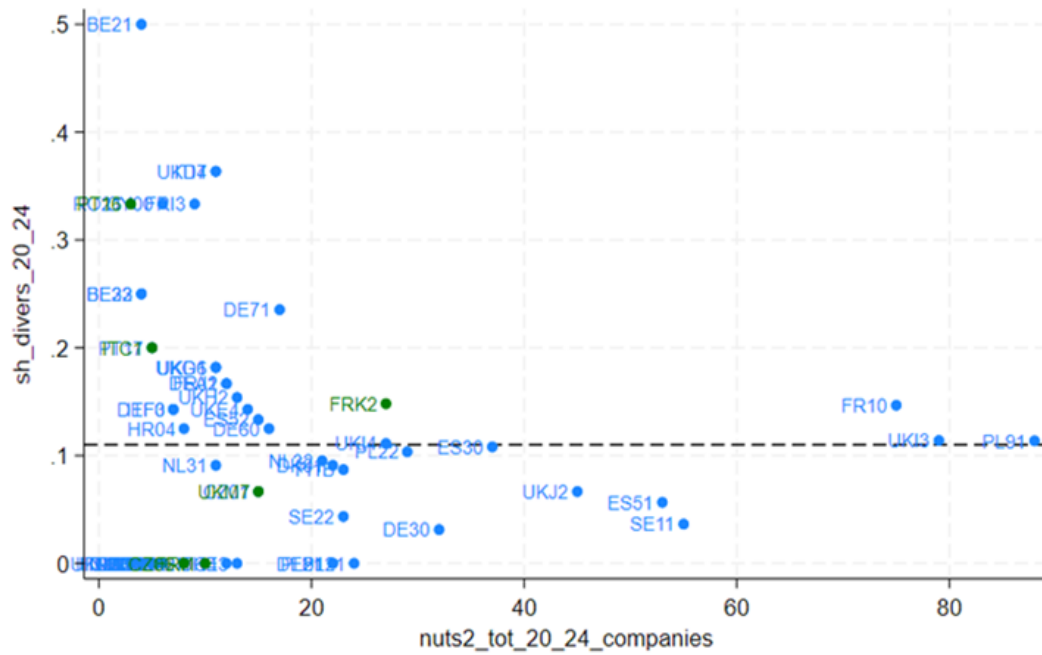
b) Developers



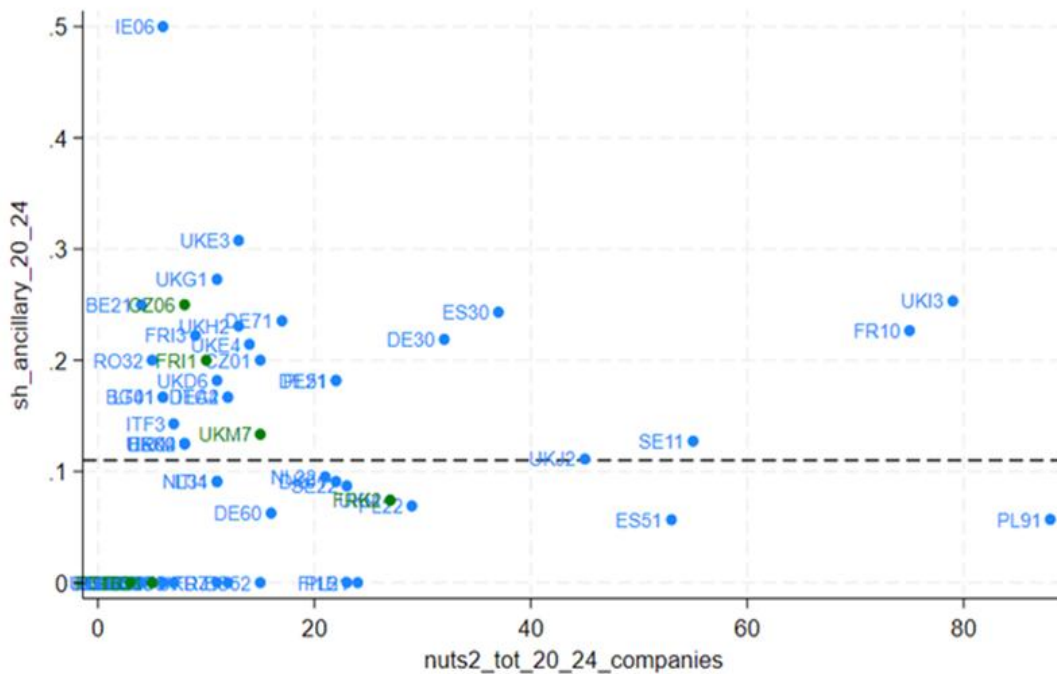
c) Integrated firms



d) Diversified firms



e) Complementary services



4.2.2 *Technological and functional specialization: a focus on GAME-ER clusters' regions*

Turning specifically to the six regions of the **GAME-ER** clusters – Centro (Portugal), Jihovýchod (Czech Republic), Piemonte (Italy), Eastern Scotland (UK), Aquitaine (Bordeaux, France), and Rhône-Alpes (Lyon, France) – and combining the analysis of technological specialization together with the specialization along the supply chain, T2.2 finds six local configurations that reflect different stages and strategies within the industry.

Piemonte (Italy) presents a relatively balanced structure, with developers and integrated firms each representing around 40%, and diversified firms making up the remaining 20%. The absence of pure publishers or service firms, together with a still limited number of active firms (5 in the **GAME-ER** database), may suggest an emerging ecosystem, moving from a purely development-centric model toward a greater integration and value chain control in a context of small firms.

In Eastern Scotland, it is possible to observe a balanced and more complex ecosystem: integrated firms represent 40% of the total number of companies, followed by developers at 27%, publishers and complementary services at 13%, and smaller shares of diversified companies. This combination reflects a region with a strong tradition of both development and self-publishing, supported by a robust network of supporting roles and a historically established gaming culture.

Similarly, Rhône-Alpes (Lyon) exhibits a diversified and articulated structure. Developers represent 37%, integrated firms 26%, and publishers and diversified firms both around 15%, with a small share of service providers. This balanced distribution suggests a well-established, full-spectrum ecosystem, capable of supporting a wide variety of business models and roles, likely fueled by the presence of large anchor firms (e.g., EA and Arkane), and a dense network of smaller players.

Conversely, Centro (Portugal) is characterized by an almost even division among developers (33%), integrated firms (33%), and diversified companies (33%), with no pure publishers or service specialists. This profile, also considering that the cluster is populated by 3 firms in the **GAME-ER** database, suggests a small and still emerging ecosystem, where companies often combine roles to adapt to limited resources and market opportunities.

In Jihovýchod (Czech Republic), the ecosystem is more production-oriented, with developers and integrated firms each representing, respectively, about 38% of the total, complemented by a notable share (25%) of complementary service providers. This indicates a region that, while still focused on game creation, is already developing specialized support activities along a possible path of gradual evolution and cluster formation.

Finally, the case of Aquitaine (Bordeaux) is particularly striking: a dominant 70% share of integrated companies, with a small share of publishers and a relative presence of complementary services (20%). This may point to a highly consolidated and mature ecosystem, where most firms have

developed full in-house capabilities from development to publishing, complemented by specialized local service providers.

Combining the regional specialization data, in terms of videogame platforms, with that of companies' role, it is possible to build a classification of clusters as an explorative attempt, to be fully developed for the 62 regions in the next step of the research (Task 2.3).

Table 15 is a first attempt in this direction and provides a synthetic overview of the strategic orientation of the six regions with **GAME-ER** clusters, combining their dominant platform focus with the functional specialization of firms.

Table 15. GAME-ER Clusters: Role and Platform Specialization

GAME-ER Clusters	Functional specialization	Platform Specialization
Aquitaine	Leading presence of Integrated firms	Highly PC-focused
Centro	Balanced structure: Developers Integrated firms and Diversified firms	Highly PC-focused
Eastern Scotland	Mainly concentrated in: Integrated firms and Developers	Balanced PC/Console
Jihovýchod	Balanced structure: Developers, Integrated firms and Complementary services	Combined PC + Mobile
Piemonte	Mainly concentrated in: Developers and Integrated firms	Balanced PC/Console
Rhône-Alpes	Mainly concentrated in Developers and Integrated firms	Console Leading

Concerning their technological specialization described by the main videogame platforms for which local firms released their games, clusters are distributed from those highly specialized in PC games (such as Aquitaine and Centro), through regions with a combined PC and mobile focus (like Jihovýchod), to areas with a more balanced PC/console profile (such as Piemonte and Eastern Scotland), and finally to Rhône-Alpes, which stands out for its strong console specialization (although well positioned also in the PC segment).

Similarly, the analysis of the structure of each cluster in terms of the main roles in which local firms are specialized, can guide this research distinguishing between pure developer-focused ecosystems, strongly integrated clusters capable of both development and publishing, and hybrid configurations where clusters show substantial shares of multiple roles (e.g., Developer/Integrated or Developer/Complementary services).

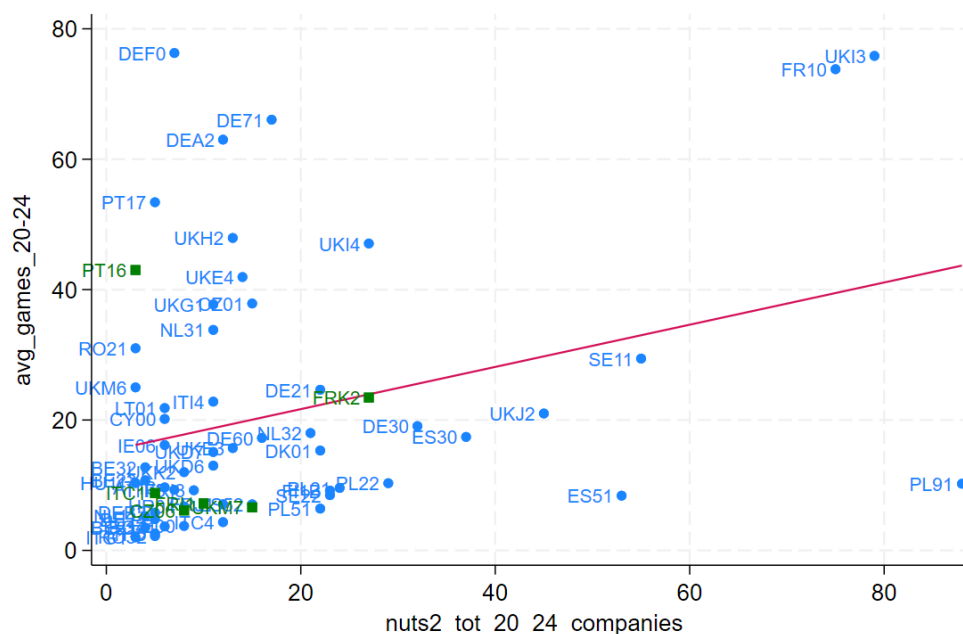
This positioning makes it possible to identify not only the technological focus of each region but also the level of value chain integration and specialization in business functions. The combination of the two dimensions can be useful to provide an initial and tentative characterization and will help the elaboration and building of a VGI cluster classification in the next step of the research (Task 2.3).

4.2.3 Regional performance

Metrics developed from MobyGames data, like number of companies, average number of games and average number of games collected per region, provide a more articulated picture of the 62 regions according to their productive performance and industrial growth. Figure 25, on the horizontal axis, shows the number of companies per region, while the vertical axis displays the average number of games produced.

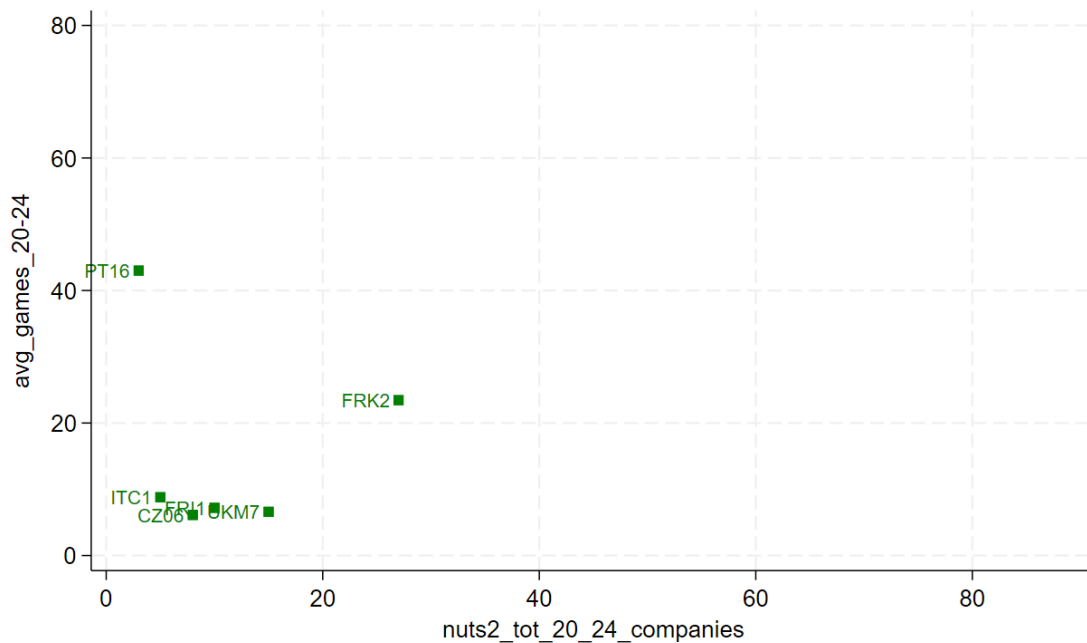
Figure 25. Number of companies and number of average games per region

a) All 62 regions



Note: The red line displays the linear trendline fitted to the data, based on a linear prediction model.

b) GAME_ER regions only



Quite predictably, the overall positive trend suggests that, in general, regions with more active companies tend to achieve higher average production in terms of the number of games released. Nevertheless, the considerable variation around this line highlights how different strategic paths and local conditions shape each regional systems in terms of industrial structure and performance.

Most regions cluster in the lower-left area, with relatively few companies (fewer than 20) and a modest average number of games (lower than 20, representing the mean for this variable). This suggests that many regional videogame production systems might be still relatively small or emerging, possibly composed of micro-studios or new entrants that have not yet scaled their production capacity.

Conversely, a few regions stand out as clear exceptions. In particular, two regions, Île-de-France (FR10) and Inner London West (UKI3), are particularly noteworthy in the upper-right corner of the space, exhibiting a high concentration of firms with notably high average productivity. These are clear examples of mature and globally competitive hubs, where strong networks, established companies, and experienced talent fuel both scale and output.

Warsaw (PL91), in contrast, is positioned far to the right with many companies but a very low average number of games per company. This may indicate a dynamic but still fragmented and developing ecosystem, where the large number of firms has not yet been translated into higher average productivity. It may also reflect a local focus on smaller studios, where the high presence of integrated firms showed in the previous analysis (Figure 25) is not related to the presence of large

companies able to perform both the activities, but rather to smaller firms that publish in-house the games they develop and are still defining their value chain role.

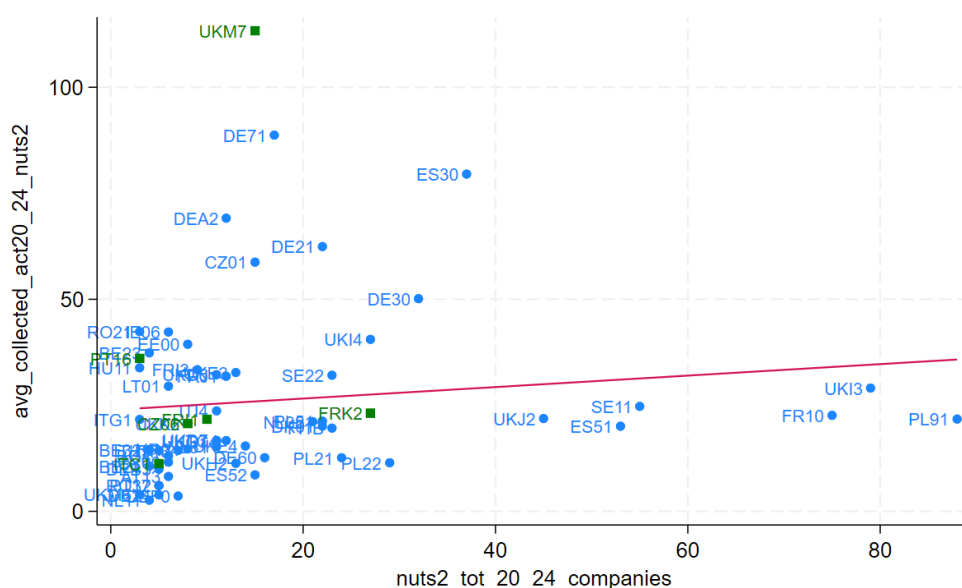
Also, some regions, like the German ones, exhibit a different dynamic: despite a small number of companies, they achieve high output in the average number of games released.

Focusing on the regions of the six **GAME-ER** clusters (highlighted in green), additional insights emerge. Rhône-Alpes (FRK2) stands in a relatively central position, indicating a moderate number of companies and above the average output. This suggests a balanced and consolidated ecosystem. Also, Piemonte (ITC1) and Jihovýchod (CZ06), as well as the regions of Bordeaux (FRI1) and Dundee (UKM7) – that is to say the majority of the regions with clusters involved in the **GAME-ER** project – are located in the lower-left side of the map, but slightly above the thickest cluster of regions, signaling small but emerging, potentially productive regional systems with room for growth and specialization. Finally, Centro (PT16) shows a rather interesting position: despite a small number of companies, it stands out with a relatively high average number of games per firm. This might suggest the presence of active studios capable of maintaining production in a smaller ecosystem. (This result may also be a statistical effect due to the small number of companies located in the region).

Figure 26 illustrates instead the relationship between the number of video game companies per region (horizontal axis) and the average number of games collected by MobyGames users (vertical axis). This metric provides a useful proxy for the commercial success of games produced by companies in each region, potentially differentiating between popular and complex AAA titles from more niche and independent or studio-centred games.

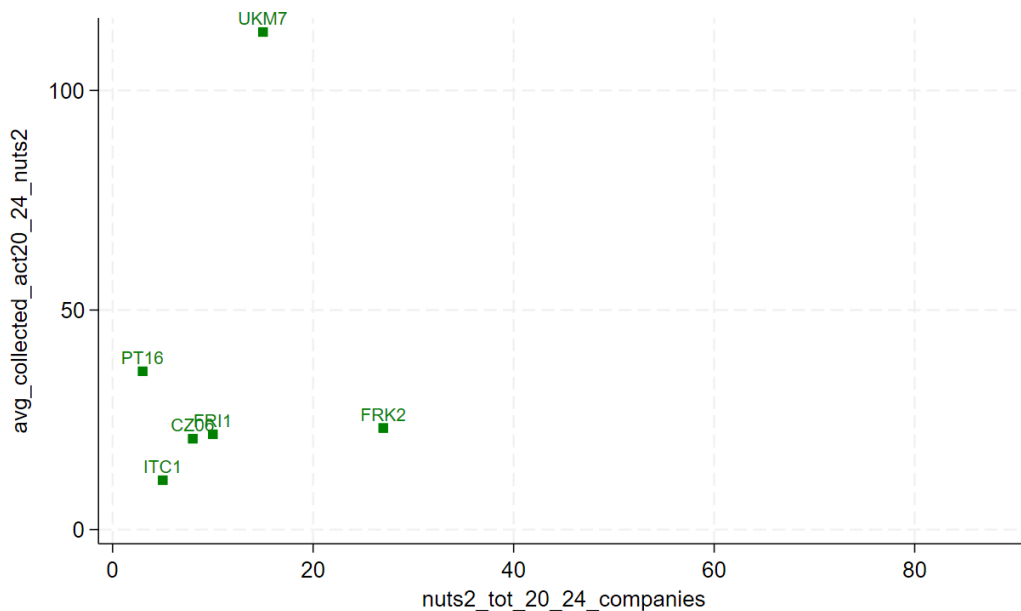
Figure 26. Number of companies and number of average games collected per region (GAMER-ER clusters in green)

a) All 62 regions



Note: The red line displays the linear trendline fitted to the data, based on a linear prediction model.

b) GAME_ER regions only



As in the previous plot, most European regions are concentrated in the lower-left corner, with a relatively small number of companies and lower average numbers of games collected. This reflects the typical structure of smaller or emerging ecosystems, where many studios might be focused on niche projects or have limited visibility in broader markets.

Some regions, however, stand out distinctly, providing insights into patterns of success and global appeal. Notably, regions such as Darmstadt (DE71), Düsseldorf (DEA2), and Prague (CZ01) are positioned higher on the vertical axis, indicating that although they may not host an exceptionally high number of companies, the games produced there tend to achieve significant success. This suggests the presence of studios that have developed strong reputations or produced highly popular titles, emphasizing quality and impact.

In contrast, major hubs like Île-de-France (FR10), Inner London West (UKI3), and Warsaw (PL91), despite having a large number of companies, appear lower on the vertical axis. This indicates that while these regions are highly dynamic in terms of company activity, the average popularity of games per company is somewhat lower. This could reflect greater heterogeneity among firms, with many small or experimental studios alongside larger players, diluting the average success metrics, but also a statistical effect due to the large number of companies.

When considering the **GAME-ER** clusters, highlighted in green, it is possible to observe some particularly interesting positions that shed light on different strategic profiles. Eastern Scotland (UKM7) stands out clearly at the top of the plot, combining a relatively small number of companies

with an exceptionally high average number of games collected. This suggests a strong focus on quality and global resonance, possibly thanks to a few anchor studios (such as Rockstar Dundee or 4J Studios) with internationally acclaimed titles. The Rhône-Alpes region (FRK2) occupies a median position, indicating a moderate number of companies coupled with a satisfactory level of success per company. This observation suggests the presence of a balanced ecosystem, wherein the games produced attain significant user recognition without the region being dominated by a small number of large studios. Piemonte (ITC1), Jihovýchod (CZ06), Aquitaine (FRI1), and Centro (PT16) are positioned in the lower-left quadrant, similar to many emerging regions. This suggests ecosystems that are still developing both in terms of company base and in achieving widespread game popularity. These regions may be focused on consolidating their production capacity and establishing stronger reputations.

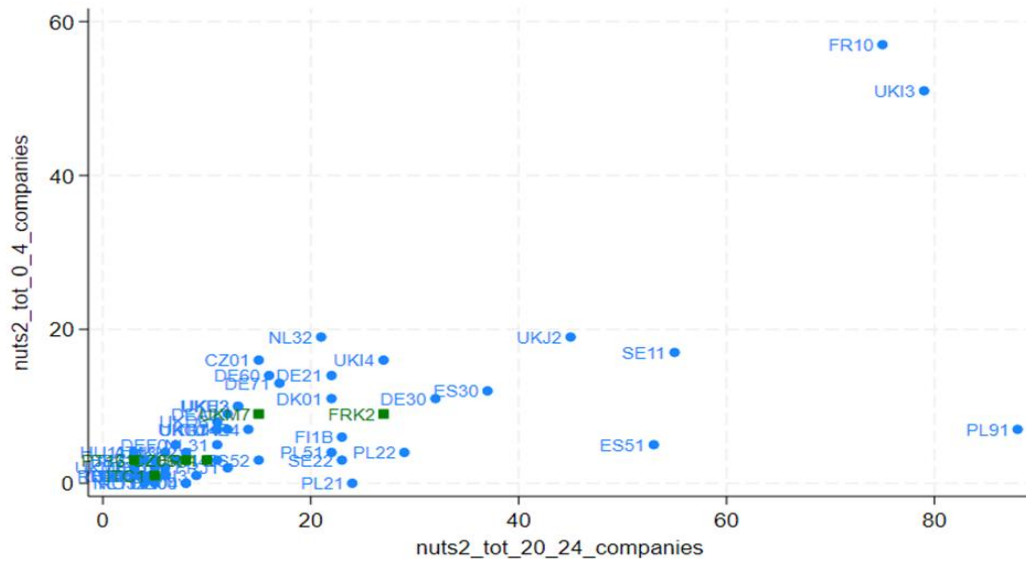
In sum, these results highlight that success and popularity, especially when cultural and creative industries are considered, do not necessarily directly align with the number of companies or even the overall output. Instead, certain regions manage to achieve a strong reputation and high user recognition through focused strategies, renowned titles, or the presence of key leading companies.

Moving to a more temporal dynamic perspective, comparing the number of active video game companies in 2020-2024 with the number of companies that were active in 2000-2004 for each of the 62 clusters highlighted thus far, can provide an idea of the dynamics at play in terms of cluster growth, particularly those that have grown significantly in recent years, as opposed to clusters that are consolidated or hindering their ability to support company formation (Figure 27).²⁶

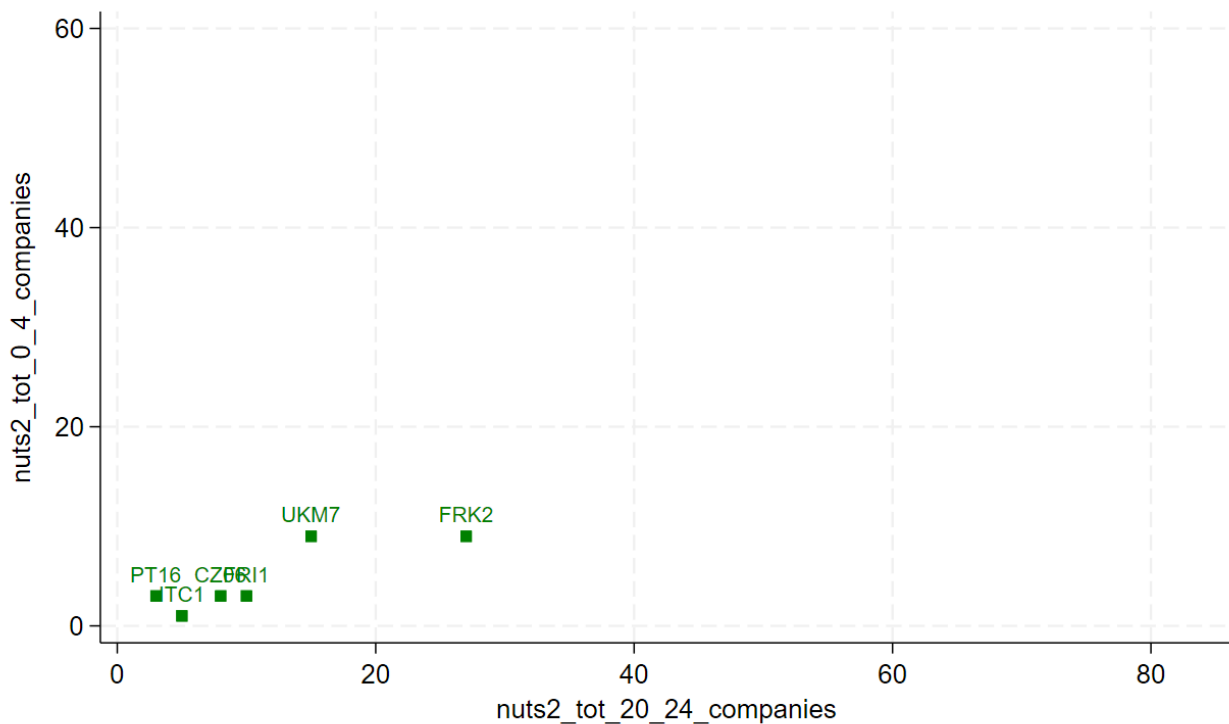
²⁶ Clearly these dynamics might be also affected by exogenous factors, with both positive and negative effects on clusters' growth, such as the Great Financial Crisis in 2008, the COVID-19 pandemic crisis in 2020 and the resulting state and institutional intervention through public spending and support to firms. These exogenous elements tend to impact all regions.

Figure 27. Number of active companies 2020-2024 vs 2000-2004

a) All 62 Regions



b) GAME-ER Regions only



The majority of regions are concentrated in the lower-left quadrant. This observation indicates that these regions had a limited number of companies in the early 2000s and continue to exhibit a relatively modest company density in present days. These regions are hypothesised to represent smaller ecosystems, which have either grown slowly over time or only recently begun to develop a local VGI.

Some regions appear further along the horizontal axis but remain close to the bottom of the vertical axis, notably Surrey, East and West Sussex (UKJ2), Cataluña (ES51), Stockholm (SE11), Warsaw (PL91). This suggests a robust ongoing expansion: these regions currently host many active companies but had very few, or even no companies, two decades ago. This pattern characterizes rapidly growing, young ecosystems, where arguably a surge in entrepreneurial activity and new firm formation has occurred only in recent years.

Conversely, regions positioned higher on the vertical axis (e.g., Île-de-France, FR10, and Inner London West, UKI3) indicate a longstanding presence of many active companies since the early 2000s, and they continue to support a large number today. These hubs illustrate consolidated and mature ecosystems, where the local VGI has shown persistent growth and demonstrated resilience over time.

The **GAME-ER** clusters, highlighted in green, reveal diverse trajectories that substantially reflect the productive picture described in Figure 25 and Figure 26. Rhône-Alpes (FRK2) sits in an intermediate position, suggesting a region that already had a moderate base of companies two decades ago and has since experienced steady growth. In contrast, regions such as Piemonte (ITC1), Jihovýchod (CZ06), Aquitaine (FRI1) and Centro (PT16) are positioned closer to the lower left, reflecting ecosystems that were small or even non-existent in the early 2000s and have since started to develop, albeit still on a modest scale. Eastern Scotland (UKM7), although not extremely far along either axis, indicates some historical presence combined with moderate recent growth.

Such temporal analysis provides useful insights and preliminary hypotheses into the dynamics of regional video game industries. It helps to distinguish between consolidated ecosystems that have sustained and expanded their company base over two decades and emerging regions where the development of a local VGI is very recent and sometimes rapid but not yet consolidated. Such preliminary hypotheses provide a base for and will be enriched by the next step of this research (Task 2.3), where a classification of the European clusters in the videogame industry will be articulated.

4.2.4 *Comparing regional specialization at national and European level*

Specialization can vary significantly depending on the indicator used. Looking at the main structural dimensions and variables highlighted thus far in this section, it is possible to hypothesize that:

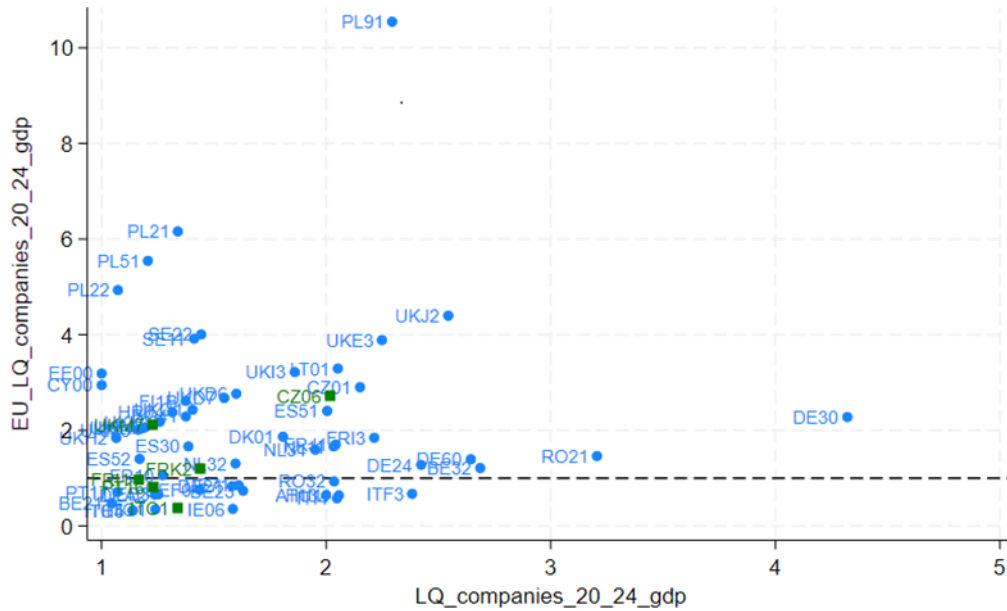
- The number of companies shows where entrepreneurial density and industrial clustering are stronger.
- The number of games released points to production activity and regional output capacity.
- The number of games collected by users reveals actual market success and popularity.

Through the application of the methodology of the location quotients (LQs), T2.2 aims to provide a deeper understanding of the specialization patterns of 62 selected regions. In particular, using the number of companies, the number of games and the number of games collected by users, respectively, the Figures 28, 29 and 30 display how specialized each region is compared to its country average (Location quotient computed at country level, horizontal axis) and to the European average (Location quotient computed at European level, vertical axis). To ease the interpretation, dashed lines report on the country and European average specialization levels (set at value 1, according to the Location quotient formula).

Clusters above the horizontal line are more specialized than the European average, while those to the right of the vertical dashed line are more specialized than their national average. Regions in the upper-right quadrant are thus highly specialized both in a European and national context, representing the strongest local hubs.

Figure 28. VGI Location quotients based on the number of companies and compared to country level (axis X) and European average (axis Y). GAME-ER clusters in green. GDP used as an economic indicator of regional and the total size of the economy.

a) All 62 regions



b) GAME-ER Regions only

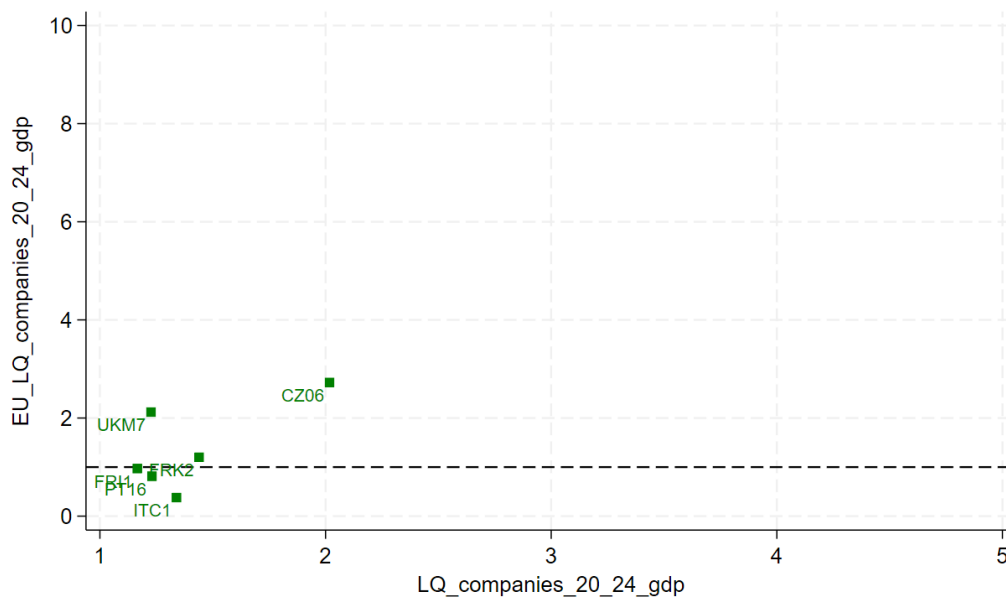
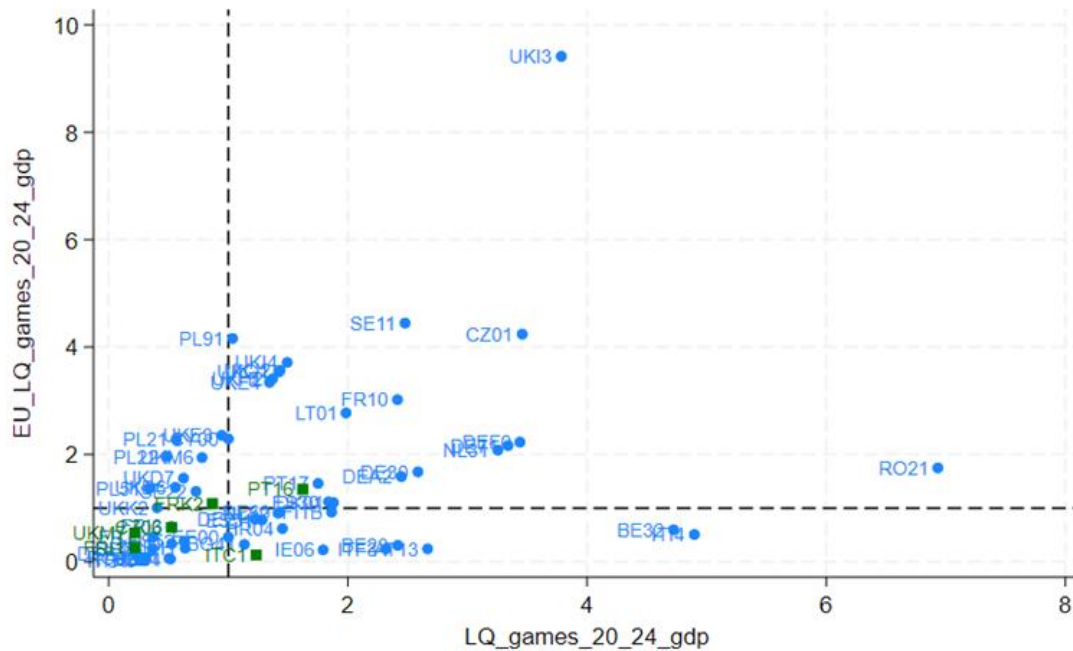


Figure 29. VGI Location quotients based on the number of games released and compared to country level (axis X) and European average (axis Y). GAME-ER clusters in green. GDP used as an economic indicator of regional and the total size of the economy.

a) All 62 regions



b) GAME-ER Regions only

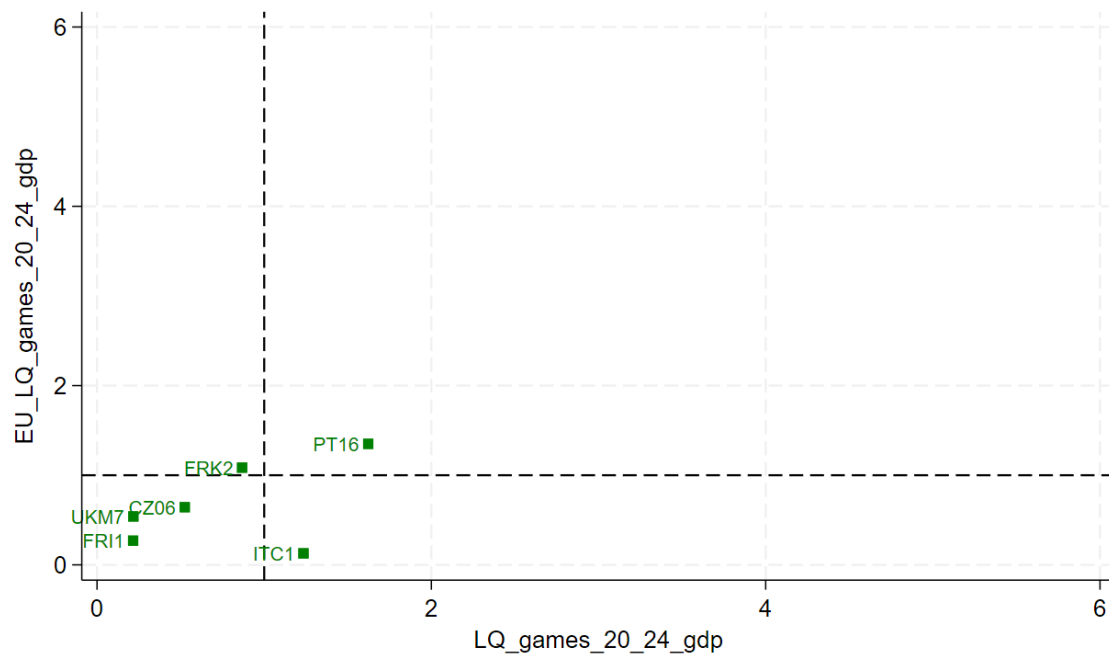
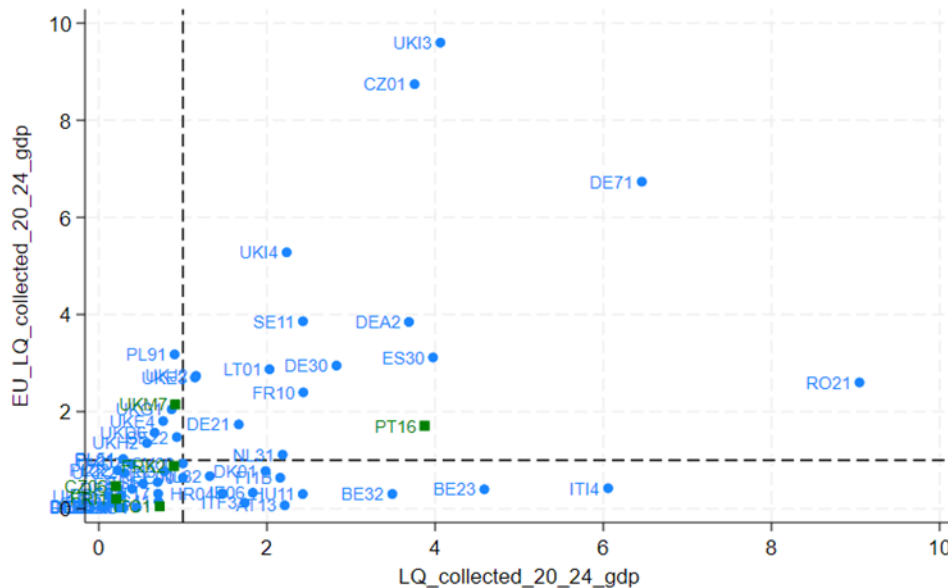
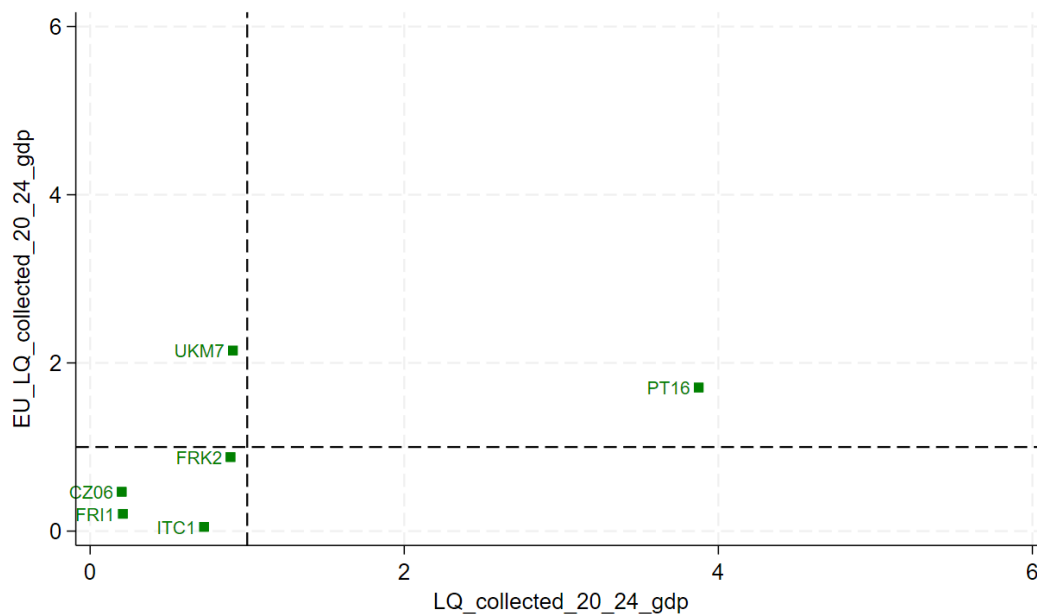


Figure 30. VGI Location quotients based on the number of games collected by MobyGamea users and compared to country level (axis X) and European average (axis Y). GAME-ER clusters in green. GDP used as an economic indicator of regional and the total size of the economy.

a) All 62 regions



b) GAME-ER Regions only



In Figure 28, many regions are concentrated in the lower side of the space, indicating that they are less specialized than the European average. Conversely, clusters in Poland (PL51, PL21) including Warsaw (PL91), Scandinavian, and UK (including London - UKI3) are characterized by a strong concentration of companies, showing their role as established and mature hubs within the European landscapes.

In Figure 29, which focuses on games released, we observe a somewhat more scattered distribution. Regions like Inner London West (UKI3), Stockholm (SE11), Prague (CZ01), and to a lesser extent Île-de-France (FR10) are prominent in the upper-right quadrant. These clusters maintain high levels of production activity, underlining their capacity to generate and release a substantial number of titles.

Some regions shift upward compared to the first plot, suggesting that even with a moderate number of companies, they achieve high output in terms of games. This may reflect greater productivity or the presence of particularly active studios. Regions in the upper-left quadrant, above the European average but to the left of their national line, highlight cases where strong local specialization is shaped by a generally high national focus on game production.

Finally, Figure 30 which uses the number of games collected by users as a proxy for popularity or success, reveals a different pattern. Here, regions like Inner London West (UKI3), Prague (CZ01), and Darmstadt (DE71) rise even higher, indicating that these regions not only produce many games but that their titles are widely collected, signalling strong market appeal and global resonance.

Among the **GAME-ER** regions, Eastern Scotland (UKM7) stands out as well, showing a strong performance in terms of collected games despite a smaller base of companies or released games. This highlights, as we have already suggested, the importance of popular titles or anchoring firms for driving success beyond mere volume. Also in this case, some regions remain low or move leftward, suggesting they produce games but have not yet achieved high levels of user recognition, possibly due to niche focus or limited international reach.

In conclusion, the patterns illustrated confirm that regions that have demonstrated consistent strength across all dimensions, such as London (UKI3), Warsaw (PL91), Prague (CZ01) and Paris (FR10), can be found in main metropolitan areas and capital cities. The overall combination of dense company ecosystems, high levels of production, and strong international appeal is indicative of both scale and quality. At the same time, the regional analysis has pointed out to some more peripheral European regions that exceed average performance and specialization metrics in the videogame industry, offering **GAME-ER** a basis for classifying these zones as emerging regional systems and clusters.

In this perspective, focusing on the metrics of **GAME-ER** clusters regions, some noteworthy differences can be already highlighted. A notable observation is the distinction of Eastern Scotland (UKM7) in the analysis based on collected games. This suggests that, despite the relatively modest number of companies and released games in the database, Eastern Scotland has achieved notable success and popularity in developing titles. The Rhône-Alpes region (FRK2) demonstrates a balanced position, indicating a robust industrial foundation and effective production capabilities. However, it exhibits slightly diminished visibility in user collections when compared to the foremost hubs. Aquitaine (FRI1), Piemonte (ITC1), Jihovýchod (CZ06), and Centro (PT16) have been observed to occupy more peripheral positions, characterised by lower levels of specialisation across the dimensions analysed, although in some cases above the European average. This suggests that while

these clusters are developing and exhibiting promising activities, they are still in a phase of emergence, requiring strengthening both their production capacity and their global reach.

The analysis indicates that the propensity for strong specialisation is not exclusively determined by the quantity of companies or games produced but is also contingent on the capacity to attain global recognition and impact. This approach highlights the divergent pathways that regional clusters can adopt: from extensive, mature ecosystems with a wide range of outputs to more compact, specialised clusters that achieve success through the attainment of highly recognised titles. The diverse positions of the **GAME-ER** regions illustrate these different trajectories clearly, highlighting both consolidated strengths and areas for strategic development. These different paths will represent a starting point for the articulation of a classification of the European regional clusters (Task 2.3).

4.2.5 Levels of industry concentration across regions

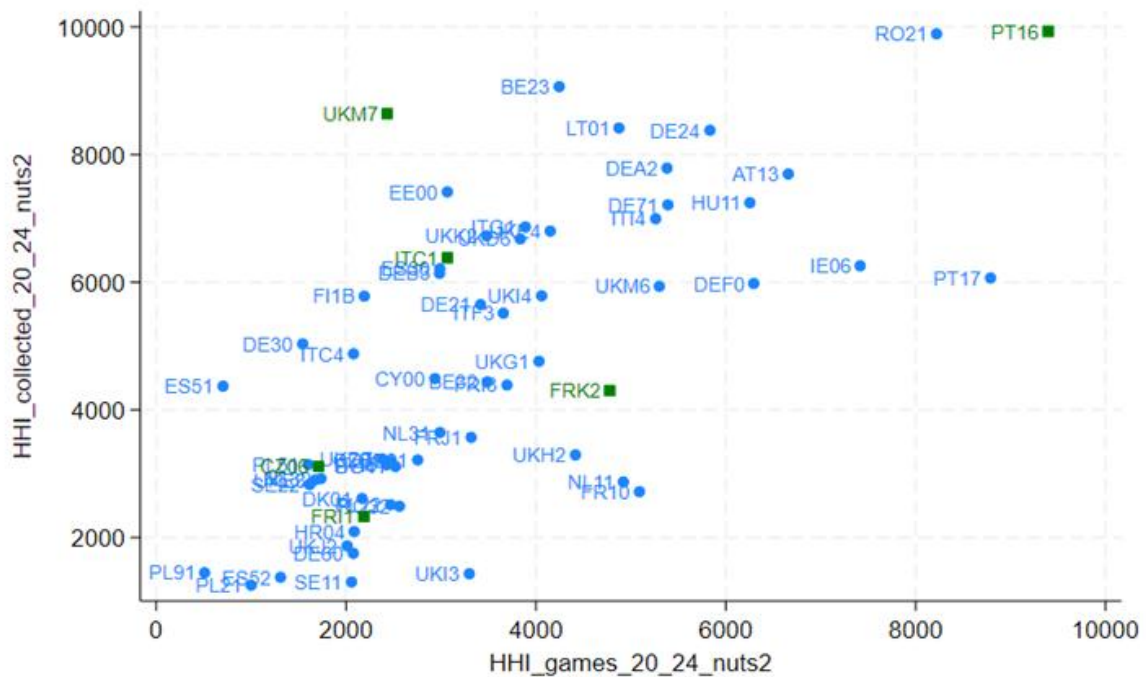
An additional dimension T2.2 is able to explore with MobyGames-derived data is the degree of concentration in regional production structure within the video game industry. This analytical dimension is useful to reveals whether a video game ecosystem is dominated by a few large firms or characterized by a more balanced mix of companies, thus highlighting distinct profiles of regional production systems. To measure the level of industry concentration, T2.2 applies the Herfindahl-Hirschman Index (HHI)²⁷ at the regional level by defining each firm's "share" as its proportion of regional activity.

Figure 31 displays the level of industry concentration of regions based on two metrics of videogame production: the number of games produced, or number of games collected by users.

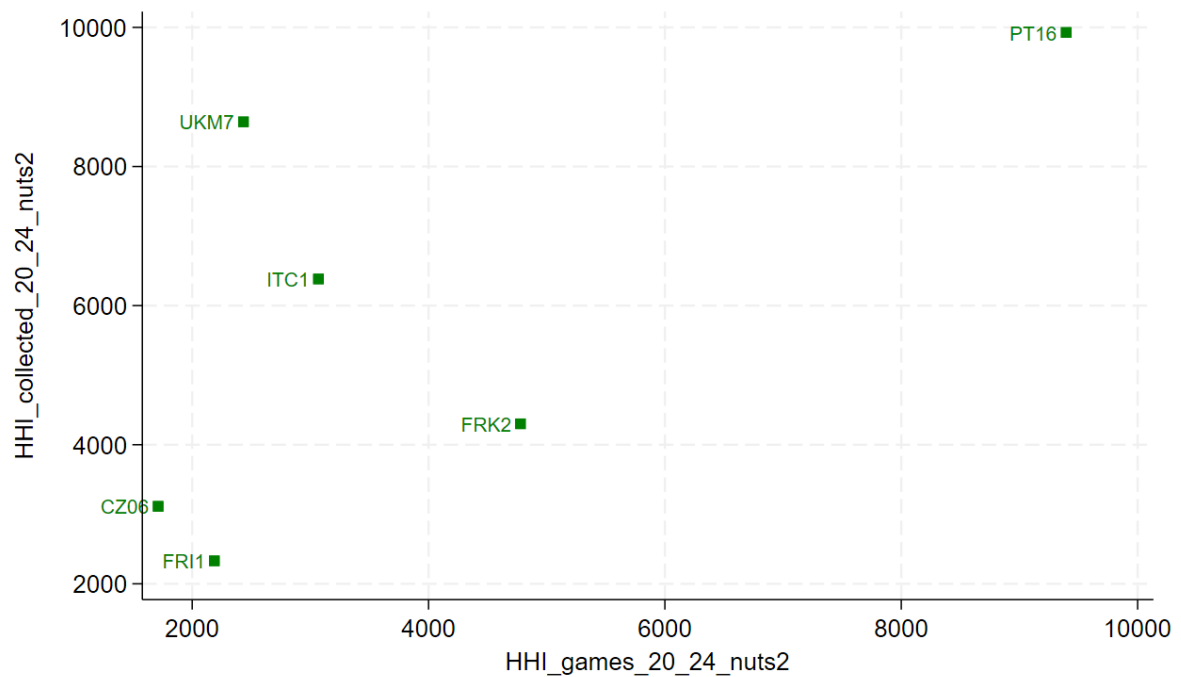
²⁷ The Herfindahl-Hirschman Index (HHI) is a concentration measure computed as the sum of the squared production/market-share percentages of all firms in a defined sector. When using the 0–10 000 scale, each share (s_i) is expressed as a whole-number percentage (0–100), squared, and then summed: $HHI = \sum_i (s_i)^2$

Figure 31. Regional concentration of VGI as measured by number of games per company (horizontal axis) and number of games collected by users (vertical axis), 2020-2024

a) All 62 regions



b) GAME-ER Regions only



Regions located in the lower-left area show lower levels of concentration, suggesting a more diffused and competitive local ecosystem where market shares are more evenly distributed among many companies. These contexts likely foster a diverse creative environment, with multiple studios contributing to both production and visibility.

As regions move toward higher HHI values on both axes, it indicates stronger dominance by a few large actors. In these ecosystems, in a theoretical world, a small number of companies account for the majority of games produced and most of the games collected by users. This would reflect higher concentration and specialization, where local success is driven by a few leading studios or anchor firms capable of shaping both production and market perception.

Yet, a critical factor to consider is that some regions, such as RO21 (Romania) and PT16 (Centro), appear extremely concentrated precisely because they have a very small number of firms. In these cases, even if each firm produces only a few games, their relative market share within the region becomes very large, pushing the HHI upwards. This pattern suggests that these regions are heavily shaped by a few actors rather than by a diversified network, signalling a still fragile ecosystem, at the very early stage of its development and lacking broader industrial depth.

Conversely, regions distributed around the centre of the space, such as some German and UK regions, exhibit more balanced structures, suggesting coexistence between established larger players and a healthy base of smaller studios.

Among the **GAME-ER** regions, Eastern Scotland (UKM7) stands out in the upper part of the chart, with high concentration in terms of collected games, indicating that while production might be less concentrated in few firms, a few titles have achieved exceptional popularity. To some extent, Piemonte (ITC1) shows a similar positioning.

Rhône-Alpes (FRK2) confirms its balanced positioning, revealing a moderate level of concentration in both production and audience reception. This indicates a more diversified local ecosystem where different actors contribute to both market supply and visibility.

Finally, Jihovýchod (CZ06), and Aquitaine (FRI1) appear in the lower or mid sections, suggesting a more diffused market structure with lower concentration levels. This arguably points to an environment where smaller studios coexist without a single actor fully dominating local production or user attention. While this can indicate a competitive and open ecosystem, it may also reflect the lack of an anchor firm to support the development of the cluster.

In conclusion, the analysis suggests some differences in the regional configurations in Europe's videogame industrial structure. Some regional systems build strength through concentration and strong anchor firms, while others maintain a more distributed structure, illustrating different paths toward specialization and cluster formation.

5 CONCLUSIONS

The report has outlined the activities conducted and the outputs achieved in Task 2.2, which focused on the development of a spatial quantitative analysis to identify European regions with established and emerging video game clusters. Through this task, the **GAME-ER** project has established a data-driven strategy to identify and geolocate video game companies operating in Europe. This approach was proposed from the project's inception as a viable option to overcome the limitations of traditional industrial classification statistics in mapping the VGI, as extensively discussed in Deliverable 2.1.

The design of the data-driven strategy required careful consideration of various methodological trade-offs concerning the identification and coverage of video game companies, as well as the accuracy and depth of the related information. The chosen approach has led to a spatially representative sample of 4,000 companies operating in the European video games industry. This was achieved by consolidating company information through text-similarity matching of a few, rich and harmonized sources (MobyGames, OGDB, and Orbis), prioritizing temporal depth and analytical consistency of the data.

This dataset provides for the first time a comprehensive snapshot of the European video games industry, whose spatial and productive organization has been validated by academic, policy, and industry stakeholders through a validation webinar conducted within Task 5.3 of the project in June 2025. Both the method and the resulting dataset represent a significant achievement for the **GAME-ER** project, which aims to provide a geographical knowledge base at the European level for the gaming industry. Additionally, by integrating data from business registers, the dataset has facilitated an understanding of the distribution of video game companies according to their primary Standard Industry Classification (SIC) codes.

Despite these achievements, it is essential to highlight some limitations of data-driven mapping which Task 2.2 helped to highlight. A data-driven mapping based on the integration of various sources through systematic web scraping and text matching techniques can only provide a partial, albeit representative, coverage of European video game companies. Even minor discrepancies in company names across different sources can lead to a potential drop in observations of video game company entries in the data set. Furthermore, a margin of error in the accuracy of georeferencing information may exist, stemming from possible mismatches resulting from the text matching techniques employed.

The analysis has also revealed substantial limitations in utilizing business registers due to the lack of homogeneity and completeness of information sources across different countries. To address these limitations, the **GAME-ER** project employed alternative proxy indicators more directly linked to video game production. At the same time, this finding is also useful to inform both EU and national

policy and industry actors about data gaps that must be addressed to consistently map the economic contribution of the videogame sectors using standard economic metrics.

The construction of the firm-level dataset has enabled **GAME-ER** to develop a regional mapping by aggregating data at the NUTS-2 level, considered the optimal geographical unit for integrating video games industry data with other European territorial statistics and for exploring spatial agglomeration dynamics. Through the use of metrics of regional specializations, the regional analysis conducted at the NUTS-2 level provides an initial comparative view of the sector's spatial concentration and helps identify 62 European regions exhibiting varying degrees of industrial specialization in the videogame sector, including those where **GAME-ER** clusters are located. Focusing on these regions and based on metrics of video game production, the analysis conducted in Task 2.2 has provided an initial overview of the primary patterns of technological and functional specialization, as well as the performance and organization of regional systems. These insights will be utilized in subsequent Task 2.3 to provide a more comprehensive classification and characterization of video game clusters based on regional analysis.

The data and information gathered in the quantitative mapping will also contribute to the Interactive Methodological Toolkit developed in WP5. The output obtained and the methods employed represent an effort to construct a first knowledge infrastructure that can serve academic, policy, and industrial stakeholders in refining future mappings of the video games industry at the European level, integrating and developing the information collected through Task 2.2 of the **GAME-ER** project, as well as enabling comparative analysis between Europe and other regions of the world in future research.

In this context, the quantitative approach at the regional level developed in Task 2.2 offers a macro perspective for identifying and studying the dynamics of video game clustering. Its robustness and evidence can be validated and complemented by the qualitative approach to defining and analyzing video game clusters developed in WP4. For instance, considering that the geographical extent of the NUTS-2 regions used in the quantitative analysis generally exceeds the geographical dimensions of the **GAME-ER** clusters studied through the qualitative approach, the use of both approaches can enhance our understanding of how the characterization of the video game sector aligns across the two methodologies and inform the definition of video game clusters.

6 REFERENCES

- Arndt, Lukas. 2023. "When Should We Believe Research Using ORBIS Firm Data?" *SSRN*.
<https://dx.doi.org/10.2139/ssrn.4584106>.
- Balland, Pierre-Alexandre, Mathijs De Vaan, and Ron Boschma. 2013. "The dynamics of interfirm networks along the industry life cycle: The case of the global video game industry, 1987–2007." *Journal of Economic Geography* 13 (5): 741–765. <https://doi.org/10.1093/jeg/lbs023>.
- Bertacchini, E. E., & Borriore, P. (2013). The geography of the Italian creative economy: The special role of the design and craft-based industries. *Regional Studies*, 47(2), 135-147.
- Boix, R., Lazzeretti, L., Capone, F., De Propriis, L., & Sánchez, D. (2012). The geography of creative industries in Europe: comparing France, Great Britain, Italy and Spain. In *Creative industries and innovation in Europe* (pp. 23-44). Routledge.
- Boix, R., Hervás-Oliver, J. L., & De Miguel-Molina, B. (2015). Micro-geographies of creative industries clusters in Europe: From hot spots to assemblages. *Papers in Regional Science*, 94(4), 753-773.
- Carroll, M. C., Reid, N., and Smith, B. W. (2008). Location quotients versus spatial autocorrelation in identifying potential cluster regions. *Ann Reg Sci*, 42(2):449–463.
- Cruz, S. C. S., & Teixeira, A. A. (2021). Spatial analysis of new firm formation in creative industries before and during the world economic crisis. *The Annals of Regional Science*, 67(2), 385-413.
- DCMS. 1998. "Creative Industries Mapping Document, 1998." UK Department for Culture, Media and Sport (DCMS). <http://www.creativitycultureeducation.org/creative-industries-mapping-document-1998>.
- DCMS. 2001. "Creative Industries Mapping Document 2001 Department for Culture Media and Sport." <https://www.gov.uk/government/publications/creative-industries-mapping-documents-2001>.
- De Vaan, Mathijs. 2015. "Game Changer: The Topology of Creativity." *American Journal of Sociology* 120(4): 1144-1194. <https://doi.org/10.1086/681213>.
- De Vaan, Mathijs, Ron Boschma, and Koen Frenken. 2013. "Clustering and firm performance in project based industries: the case of the global video game industry, 1972–2007." *Journal of Economic Geography* 13 (6): 965–991. doi.org/10.1093/jeg/lbs038.
- De Vaan, Mathijs, Koen Frenken, and Ron Boschma. 2019. "The Downside of Social Capital in New Industry Creation." *Economic Geography* 95 (4): 315-340. 10.1080/00130095.2019.1586434.
- EGDF, The European Games Developer Federation, 2022 report:
<https://www.egdf.eu/wpcontent/uploads/2024/06/2022-European-video-games-industry-insight-report.pdf>

EU Commission. 2021. "CREATIVE EUROPE 2021-2022."

<https://www.europacreativamedia.it/documenti/allegati/2023/monitoring-report-2021-2022.pdf>.

EU Commission, ECORYS, and KEA. 2023. "Understanding the Value of a European Video Games Society: Final Report."

Kalemli-Ozcan, Sebnem, Bent Sorensen, Carolina Villegas-Sanchez, Vadym Volosovych, and Sevcan Yesiltas. 2022. "HOW TO CONSTRUCT NATIONALLY REPRESENTATIVE FIRM LEVEL DATA FROM THE ORBIS GLOBAL DATABASE: NEW FACTS AND AGGREGATE IMPLICATIONS." *NBER WORKING PAPER SERIES*. <http://www.nber.org/papers/w21558>.

KEA. 2019. "Culture and creative sectors in the European Union – Key future developments, challenges and opportunities." <https://keanet.eu/publications/culture-and-creative-sectors-in-the-europeanunion-key-future-developments-challenges-and-opportunities/>.

KEA and PPMI. 2019. "Culture and creative sectors in the European Union – Key future developments, challenges and opportunities. Technical report."

Lazzeretti, L., Boix, R., & Capone, F. (2008). Do creative industries cluster? Mapping creative local production systems in Italy and Spain. *Industry and innovation*, 15(5), 549-567.

Mateos-Garcia, Juan, Hasan Bakhshi, Mark Lenel, and NESTA. 2014. "A MAP OF THE UK GAMES INDUSTRY." *NESTA Report*. <https://www.nesta.org.uk/report/a-map-of-the-uk-games-industry/>.

Méndez-Ortega, Carles, and Josep-Maria Arauzo-Carod. 2019. "Locating Software, Video Game, and Editing Electronics Firms: Using Microgeographic Data to Study Barcelona." *Journal of Urban Technology* 26 (3): 81-109. <https://doi.org/10.1080/10630732.2019.1613866>.

Méndez-Ortega, Carles, and Josep-Maria Arauzo-Carod. 2020. "Do software and video game firms share location patterns across cities? Evidence from Barcelona, Lyon and Hamburg." *The Annals of Regional Science* 64 (3): 641-666. 10.1007/s00168-019-00917-y.

NESTA & UKIE, Hasan Bakhshi, and Juan Mateos-Garcia. 2014. "The Geography of Creativity in the UK Creative clusters, creative people and creative networks." NESTA creative England. <https://applications.creativeengland.co.uk/assets/public/resource/302.pdf>.

O'Donoghue, D. and Gleave, B. (2004). A note on methods for measuring industrial agglomeration. *Regional Studies*, 38(4):419-427.

OECD, Giuseppe Berlingieri, Sara Calligaris, Chiara Criscuolo, Jonathan Timmis, and Matej Bajgar. 2020. "Coverage and representativeness of Orbis data." *OECD Science, Technology and Industry Working Papers* 2020/06. <https://dx.doi.org/10.1787/c7bdaa03-en>.

Ozalp, H. (2024). Heterogeneous development paths to growth and innovation: The evolution of the video game industry across four hubs. World Intellectual Property Organization (WIPO) Economic Research Working Paper Series, (84).

Pominova, M., Gabe, T., & Crawley, A. (2022). The stability of location quotients. *Review of Regional Studies*, 52(3), 296-320.

Storz, Cornelia, Federico Riboldazzi, and Moritz John. 2015. "Mobility and innovation: A cross-country comparison in the video games industry." *Research Policy* 44 (1): 121-137.10.1016/j.respol.2014.07.015.

Ukie. 2023. "The Economic Impacts of Video Game Technology Spillover," Report.
<https://ukie.org.uk/resources/the-economic-impacts-of-video-game-technology-spillover>.

UNCTAD. 2010. "Creative Economy Report." https://unctad.org/system/files/official_document/ditctab20103_en.pdf.

UNESCO. 2013. "Creative Economy Report 2013. Special Edition: Widening local development pathways Technical report."

WIPO. 2024. "Making Innovation Policy Work for Development." *World Intellectual Property Report*.

7 APPENDIX

7.1 Appendix: Tables

7.1.1 Appendix: Retention Rates and Robustness

7.1.1.1 First Retention Rate

Table 16 reports the retention rates obtained for the final dataset of European video game companies identified. In particular, the table reports the country's retention rate of matched companies over the total number of companies retrieved from MobyGames (corresponding to the sum of the matched and unmatched column). In addition, the table also reports the average number of games for both matched and unmatched firms.

Overall, this first retention rate is heterogeneous as several countries present a good retention rate around 50% or slightly higher (as in the case of Sweden, Norway, France, and Poland), while other countries score rather poorly (such as, Czech Republic, Hungary, Austria, and Ireland).

Table 16. Retention rates and total average number of games across all European countries (by total number of companies matched in Step 2 vs. companies registered in MobyGames)

country	N. Companies Step 2			Average n. of games	
	matched	unmatched	retention rate over the total (%)	matched	unmatched
UK	1470	1758	45,54	18,9	12,7
DE	496	919	35,05	17,8	14,1
FR	419	394	51,54	24,8	13,3
PL	345	313	52,43	18,2	9,0
SE	240	175	57,83	12,9	4,0
ES	239	294	44,84	10,4	7,1
NL	174	164	51,48	13,3	13,8
FI	108	97	52,68	5,4	8,0
IT	108	130	45,38	11,0	9,9
DK	82	71	53,59	9,1	6,4
CZ	66	401	14,13	19,9	16,5
NO	37	29	56,06	4,8	5,7
PT	37	95	28,03	15,6	13,6
BE	35	36	49,30	8,7	4,6
AT	32	87	26,89	12,7	26,3
CH	25	51	32,89	4,7	22,7
RO	23	47	32,86	7,4	13,5
HU	21	85	19,81	11,1	14,1
LT	17	23	42,50	13,3	3,4
IE	16	51	23,88	7,7	11,5

BG	15	15	50,00	5,5	7,9
SK	14	31	31,11	7,2	16,8
HR	13	29	30,95	5,2	8,7
EE	11	9	55,00	3,2	6,4
CY	7	22	24,14	17,9	7,4
SI	6	16	27,27	2,2	5,4
GR	4	37	9,76	1,0	4,4
IS	3	8	27,27	2,3	2,1
MT	2	7	22,22	4,0	2,4
LU	1	3	25,00	5,0	15,3
LV	1	19	5,00	1,0	3,2

Notes: The calculated retention rate is the ratio of the number of matched records in the second step to the total number of companies, both matched and unmatched, for each country as reported in MobyGames. GAME-ER project's elaboration.

7.1.1.2 Second Retention Rate

Table 17 reports the second retention rate calculated considering the companies active in the 2020-2024 period across both the first and second step of the matching procedure. More precisely, the retention rates reported have been calculated as the ratio of the number of matched active companies identified in the second matching to those identified in the first matching step, for each European country. Overall, the table shows good retention rates, generally between 40 and 70 percent, in the biggest European countries.

Table 17. Retention rates across countries (by total number of active companies matched in Step 2 vs. companies matched in Step 1)

Active companies 2020-2024			
country	Active matched Step 2	Active matched Step 1	Retention rate step2-step1 (%)
UK	405	999	40,54
DE	173	359	48,19
FR	190	327	58,10
PL	221	383	57,70
SE	126	163	77,30
ES	139	279	49,82
NL	61	109	55,96
FI	44	88	50,00
IT	48	94	51,06
DK	30	51	58,82
CZ	27	198	13,64
NO	21	29	72,41
PT	14	54	25,93

BE	20	31	64,52
AT	11	39	28,21
CH	12	30	40,00
RO	9	32	28,13
HU	4	30	13,33
LT	7	18	38,89
IE	7	22	31,82
BG	9	14	64,29
SK	4	14	28,57
HR	9	17	52,94
EE	8	12	66,67
CY	6	15	40,00
SI	1	5	20,00
GR	1	17	5,88
IS	2	3	66,67
MT	1	4	25,00
LU	1	1	100,00
LV	1	10	10,00

Notes: The retention rates reported have been calculated as the ratio of the number of matched companies active in the period 2020-2024, obtained in the second matching to those obtained in the first matching step, for each country. GAME-ER project elaboration.

7.1.1.3 Final database of video game companies: Robustness of name matching and geo-localisation procedures

To test the robustness of the name matching procedure and of the geo-localisation of the European video game companies, GAME-ER's T2.2 extracted a random sample of 100 observations from the final dataset of 4,067 firms,²⁸ and manually checked on the web for the accuracy of the match, based on the congruence of the company's name and its operating address.

Table 18 reports the occurrences, in percentage, of correct company matches by quartiles based on the number of games developed or published. To validate the correctness of the company match, several manual checks have been performed. In particular, the information contained in the reference company page on MobyGames has been confronted with the retrieved information from Orbis and cross-checked via company web searches. Overall, 78% of the companies in the sample extracted from the final database of 4,067 European video game companies have been correctly matched, against 22% of false or inaccurate matches. The first quartile, which presents an average number of one game per company, is the most problematic as only 68% of the firms identified

²⁸ Specifically, the random sample was designed to include an equal number of observations from each quartile based on the number of games developed or published. This was done to test the accuracy of the matching process across companies with markedly different game portfolios sizes.

correspond to a correct match, while the second, third and fourth quartiles perform better. The poor performance of the T2.2 matching process for the smallest video game companies can be attributed to the nature of the firms that fall into this first quartile. Small indie studios are less likely to be consistently tracked by business registers compared to bigger and more structured video game development firms.

Table 18. Correctness of company matching per quartile based on the number of games developed or published

Quartile	Quartile range (n. of games)	Yes	No
1	1	68%	32%
2	1-3	80%	20%
3	3-8	84%	16%
4	10-116	80%	20%
Total		78%	22%

Table 19 reports the occurrences, in percentage, of the correct company's geographical locations by quartiles based on the number of games developed or published. The correctness of the company's geo-localisation has been verified in the same way manually through web searches. Overall, 70% of the company's location has been positively verified against 19% of wrong occurrences and 11% of unverifiable occurrences.²⁹

Table 19. Correctness of geo-localisation per quartile based on the number of games developed or published

Quartile	Quartile range (n. of games)	Yes	No	N/A
1	1	52%	12%	36%
2	1-3	76%	20%	4%
3	3-8	84%	16%	0%
4	10-116	68%	28%	4%
Total		70%	19%	11%

Taking a closer look at the outcomes by percentile category, the companies whose location is harder to identify, and match, are the ones with the smallest games portfolios, which have developed or published one single game. Conversely, the companies that lie in the second and third percentile of the distribution are the ones with the highest matching rates, which are also the easiest to verify (with zero, or almost zero, N/A occurrences). Interestingly, the matching rates for companies with

²⁹ Unverifiable matches are the ones for which no information is available. This difficulty in verifying information typically arises for companies that were active in the pre-1999 or 2000-2004 period, or companies whose website is inaccessible or non-existent.

the largest video game portfolios fell again. This is attributable to the higher chances of incurring in erroneous matches of companies with the same name but different businesses or identifying subsidiaries of the parent companies outside the headquarters countries.

7.1.2 Appendix: Turnover and Employment

Table 20 reports the complete distribution of the final set of companies, both active and inactive, identified and geo-localised across Europe with the frequency of their corresponding information of turnover and employment (or the lack of) retrieved from the Orbis database.

Table 20. Comparison between turnover and employment information (available in Orbis) for the final set of European companies localized at NUTS-2 level in the countries analysed

Country	Turnover			Employment		
	N. Without	N. With	% With Turnover Data	N. Without	N. With	%With Employment Data
UK	1241	229	15,58	778	692	47,07
DE	451	45	9,07	183	313	63,10
FR	167	252	60,14	357	62	14,80
NL	164	10	5,75	46	128	73,56
PL	114	231	66,96	154	191	55,36
ES	92	147	61,51	106	133	55,65
DK	74	8	9,76	48	34	41,46
CZ	43	23	34,85	55	11	16,67
BE	32	3	8,57	27	8	22,86
AT	31	1	3,13	28	4	12,50
CH	25	0	0,00	3	22	88,00
FI	14	94	87,04	31	77	71,30
IE	14	2	12,50	6	10	62,50
IT	11	97	89,81	54	54	50,00
PT	10	27	72,97	7	30	81,08
NO	6	31	83,78	6	31	83,78
SE	6	234	97,50	49	191	79,58
HU	5	16	76,19	11	10	47,62
BG	4	11	73,33	4	11	73,33
SK	3	11	78,57	8	6	42,86
CY	2	5	71,43	5	2	28,57
EE	2	9	81,82	5	6	54,55
LT	2	15	88,24	3	14	82,35
HR	1	12	92,31	1	12	92,31
LU	1	0	0,00	1	0	0,00
RO	1	22	95,65	1	22	95,65
GR	0	4	100,00	0	4	100,00
IS	0	3	100,00	1	2	66,67
LV	0	1	100,00	0	1	100,00

MT	0	2	100,00	2	0	0,00
SL	0	6	100,00	1	5	83,33

7.1.3 Appendix: Database of European Video Game Companies: Key Figures

This section reports some additional information and key figures relative to the final set of identified and geo-localised European videogame companies. Table 21 presents the distribution of games published or developed by the companies contained in the final dataset across the complete set of countries analysed and the different gaming platforms.

Table 21. Number of games across platforms and countries of companies active between 2020 and 2024

Country	N. games	N. Computer	N. Console	N. Portable Consoles	N. Arcade Machine	N. Browser based	N. IOs	N. Mobile	N. Other mobile	N. VR
UK	15120	7280	5624	887	193	215	572	251	80	18
France	7823	4662	1750	477	67	90	394	115	265	3
Germany	5790	3835	1126	608	46	17	92	46	18	2
Poland	4988	3995	603	39	45	10	158	109	20	9
Sweden	2112	1602	284	17	16	20	87	74	8	4
Spain	1825	1121	408	80	3	11	106	61	32	3
Netherlands	1237	732	261	112	3	17	79	28	1	4
Czech Republic	636	568	20	10	0	7	18	11	2	0
Italy	458	354	53	19	1	3	18	7	3	0
Denmark	442	229	52	18	0	90	41	9	2	1
Portugal	441	348	42	0	0	1	24	26	0	0
Finland	345	221	25	7	1	7	50	20	14	0
Lithuania	158	107	20	12	0	1	16	2	0	0
Belgium	145	105	19	3	2	2	9	4	0	1
Norway	143	113	9	8	2	1	7	3	0	0
Hungary	133	111	8	1	0	0	11	1	0	1
Romania	129	51	21	4	0	1	31	8	13	0
Cyprus	121	86	3	0	0	0	26	6	0	0
Ireland	100	85	9	0	0	1	5	0	0	0
Switzerland	87	67	14	2	0	0	4	0	0	0
Austria	85	52	15	10	0	1	4	3	0	0
Slovakia	57	13	29	12	0	0	1	2	0	0
Croatia	55	44	2	0	0	0	2	6	0	1
Bulgaria	40	31	2	0	0	0	5	2	0	0
Estonia	30	22	3	0	0	0	2	2	1	0
Iceland	5	4	0	0	0	1	0	0	0	0
Luxembourg	5	2	1	0	1	0	1	0	0	0
Malta	2	2	0	0	0	0	0	0	0	0
Greece	1	1	0	0	0	0	0	0	0	0

Latvia	1	0	0	0	0	0	0	0	1	0
Slovenia	1	1	0	0	0	0	0	0	0	0
TOTAL	42515	25844	10403	2326	380	496	1763	796	460	47

Table 22 reports the distribution of European companies, active between 2020 and 2024, contained in the final database across the complete set of countries analysed and across different roles.

Table 22. Number of active companies between 2020 and 2024 across roles and countries

Country	N. Companies	Developer	Publisher	Integrated	Diversified	Complementary Services
UK	405	133	59	101	36	75
Poland	221	78	43	66	13	21
France	190	76	25	38	19	31
Germany	173	66	27	38	17	24
Spain	139	58	17	38	8	17
Sweden	126	46	16	42	10	12
Netherlands	61	20	8	24	4	5
Italy	48	19	7	11	6	5
Finland	44	15	5	20	3	1
Denmark	30	12	4	10	2	2
Czech Republic	27	7	2	11	2	5
Norway	21	10	2	7	1	1
Belgium	20	7	0	6	2	5
Portugal	14	5	1	6	1	1
Switzerland	12	6	2	4	0	0
Austria	11	6	0	4	0	1
Bulgaria	9	3	0	3	1	2
Croatia	9	5	0	2	1	1
Romania	9	2	0	4	1	2
Estonia	8	2	0	5	0	1
Ireland	7	2	2	0	0	3
Lithuania	7	2	1	2	1	1
Cyprus	6	0	2	2	0	2
Hungary	4	3	0	1	0	0
Slovakia	4	2	1	0	1	0
Iceland	2	2	0	0	0	0
Greece	1	0	0	1	0	0
Luxembourg	1	0	0	1	0	0
Latvia	1	1	0	0	0	0
Malta	1	0	0	1	0	0
Slovenia	1	1	0	0	0	0
TOTAL	1612	589	224	448	129	218

7.1.4 Appendix: NACE Code Distribution

The present section reports additional analyses on the industrial classification applied to companies operating in the videogame industry, in particular with respect to the distribution of NACE Rev. 2 codes. Table 23 expands upon Table 14 by presenting the distribution and relative share of the top 15 most common NACE codes across the **GAME-ER** partner countries – namely, the United Kingdom, France, Italy, Czech Republic, Portugal, Belgium and Croatia.

Based on the complete final dataset of 4,067 European video game companies, the United Kingdom consistently accounts for the highest proportion of firms across all the top 15 NACE codes. This outcome is consistent with prior findings regarding the overall distribution of companies, which highlights the UK as hosting the largest number of video game firms among the partner countries. The data therefore reflect the UK's prominent role in the European video game industry, both in absolute numbers and in the diversity of activities under which companies are classified.

Table 23. Top 15 NACE codes per GAME-ER partner countries (as a % of total number of companies)

NACE code	Description	% United Kingdom	% France	% Spain	% Italy	% Czech Republic	% Portugal	% Belgium	% Croatia
6201	Computer programming activities	33,76	6,91	4,09	2,54	0,63	0,63	1,06	0,78
5821	Publishing of computer games	22,75	15,88	8,24	2,14	0,31	1,83	0,31	0,15
6202	Computer consultancy activities	54,14	12,41	7,52	2,26	1,13	0,75	0,38	0,00
6209	Other information technology and computer service activities	70,28	2,41	9,64	2,41	0,00	0,80	0,40	0,00
5829	Other software publishing	52,80	13,55	1,87	0,93	7,01	0,93	0,93	0,00
8299	Other business support service activities	67,80	3,39	2,82	3,39	0,00	0,56	0,00	0,00
5911	Motion picture, video and television programme production activities	32,61	26,09	2,90	4,35	0,00	0,00	0,00	0,00
3240	Manufacture of games and toys	21,11	3,33	2,22	3,33	0,00	0,00	1,11	0,00
7311	Advertising agencies	13,16	5,26	7,89	2,63	2,63	1,32	0,00	0,00
7410	Specialised design activities	22,06	16,18	2,94	5,88	2,94	1,47	0,00	0,00
9003	Artistic creation	66,67	4,55	1,52	1,52	0,00	0,00	0,00	0,00
4651	Wholesale of computers, computer peripheral equipment and software	3,70	14,81	11,11	1,85	0,00	0,00	1,85	0,00
9329	Other amusement and recreation activities	39,13	15,22	4,35	6,52	2,17	2,17	0,00	0,00

5912	<i>Post-production of film, video production and television programs</i>	17,78	44,44	15,56	0,00	0,00	0,00	0,00	0,00
4690	Non-specialised wholesale trade	26,83	12,20	7,32	0,00	19,51	0,00	0,00	2,44

Notes: The code in italics – specifically, the 59.12 “Post-production of film, video production and television programs” – was not included in the list of 31 relevant NACE codes for the video game sector. This code was identified in the second Orbis validation search of the companies in the final dataset.

Table 24 shows the top 10 NACE codes per **GAME-ER** partner countries (The UK, France, Italy, Portugal, Spain, Czech Republic, Belgium and Croatia) as a percentage of the total NACE codes occurrences.

Table 24. Top 10 NACE Rev.2 codes per GAME-ER partner countries (as percentages)

NACE code	Description	% UK	% FR	% IT	% PT	% ES	% CZ	% BE	% HR
6201	Computer programming activities	33,8	6,9	2,5	0,6	4,1	0,6	1,1	0,8
5821	Publishing of computer games	22,7	15,9	2,1	1,8	8,2	0,3	0,3	0,2
6202	Computer consultancy activities	54,1	12,4	2,3	0,8	7,5	1,1	0,4	0,0
6209	Other information technology and computer service activities	70,3	2,4	2,4	0,8	9,6	0,0	0,4	0,0
5829	Other software publishing	52,8	13,6	0,9	0,9	1,9	7,0	0,9	0,0
8299	Other business support service activities	67,8	3,4	3,4	0,6	2,8	0,0	0,0	0,0
5911	Motion picture, video and television programme production activities	32,6	26,1	4,3	0,0	2,9	0,0	0,0	0,0
3240	Manufacture of games and toys	21,1	3,3	3,3	0,0	2,2	0,0	1,1	0,0
7311	Advertising agencies	13,2	5,3	2,6	1,3	7,9	2,6	0,0	0,0
7410	Specialised design activities	22,1	16,2	5,9	1,5	2,9	2,9	0,0	0,0

Table 25 shows the top three most frequent NACE codes across **GAME-ER** partner countries.

Table 25. Top 3 most frequent NACE codes in each GAME-ER project partner country

Country	NACE Rev.2 code	Frequency	Code Description
BE	6201	15	Computer programming activities
BE	5829	2	Other software publishing
BE	4321	2	Electrical installation
CZ	5829	15	Other software publishing
CZ	6200	13	Computer programming, consultancy and related activities
CZ	6201	9	Computer programming activities
ES	6201	58	Computer programming activities
ES	5821	54	Publishing of computer games
ES	6209	24	Other information technology and computer service activities
FR	5821	104	Publishing of computer games
FR	6201	98	Computer programming activities
FR	5911	36	Motion picture, video and television programme production activities
GB	6201	479	Computer programming activities
GB	6209	175	Other information technology and computer service activities
GB	5821	149	Publishing of computer games
HR	6201	11	Computer programming activities
HR	5821	1	Publishing of computer games
HR	4690	1	Non-specialised wholesale trade
IT	6201	36	Computer programming activities
IT	5821	14	Publishing of computer games
IT	6209	6	Other information technology and computer service activities
PT	5821	12	Publishing of computer games
PT	6201	9	Computer programming activities
PT	9319	3	Other sports activities

Table 26 presents the distribution of total and active companies across the top three most frequent NACE codes in each **GAME-ER** partner country.

Table 26. Top 3 most frequent NACE codes in each GAME-ER project partner country (total number of companies vs. active companies)

Country	NACE Rev.2	Description	Tot. Companies	N. Active Companies
BE	6201	Computer programming activities	15	10
BE	5829	Other software publishing	2	0
BE	4321	Electrical installation	2	1
CZ	5829	Other software publishing	15	9

CZ	6200	Computer programming, consultancy and related activities	13	8
CZ	6201	Computer programming activities	9	2
ES	6201	Computer programming activities	58	37
ES	5821	Publishing of computer games	54	39
ES	6209	Other information technology and computer service activities	24	17
FR	5821	Publishing of computer games	104	60
FR	6201	Computer programming activities	98	52
FR	5911	Motion picture, video and television programme production activities	36	18
GB	6201	Computer programming activities	479	195
GB	6209	Other information technology and computer service activities	175	24
GB	5821	Publishing of computer games	149	90
HR	6201	Computer programming activities	11	8
HR	5821	Publishing of computer games	1	1
HR	4690	Non-specialised wholesale trade	1	0
IT	6201	Computer programming activities	36	22
IT	5821	Publishing of computer games	14	9
IT	6209	Other information technology and computer service activities	6	4
PT	5821	Publishing of computer games	12	6
PT	6201	Computer programming activities	9	4
PT	9319	Other sports activities	3	1

Table 27 reports the distribution active companies across NACE Rev. 2 codes.

Table 27. Distribution of active companies' NACE codes

NACE Rev.2 Code	Description	Freq.	Perc.	Cum.
6201	Computer programming activities	663	41.44	41.44
5821	Publishing of computer games	408	25.50	66.94
5829	Other software publishing	60	3.75	70.69
6209	Other information technology and computer service activities	59	3.69	74.38
3240	Manufacture of games and toys	54	3.38	77.75
6202	Computer consultancy activities	49	3.06	80.81
5911	Motion picture, video and television programme production activities	45	2.81	83.62
8299	Other business support service activities	39	2.44	86.06
7410	Specialised design activities	30	1.88	87.94
5912	Motion picture, video and television programme post-production activities	27	1.69	89.62
7311	Advertising agencies	21	1.31	90.94

9003	Artistic creation	20	1.25	92.19
4651	Wholesale of computers, computer peripheral equipment and software	16	1.00	93.19
6200	Computer programming, consultancy and related activities	16	1.00	94.19
6203	<i>Computer facilities management activities</i>	13	0.81	95.00
9329	Other amusement and recreation activities	13	0.81	95.81
7430	Translation and interpretation activities	12	0.75	96.56
4690	Non-specialised wholesale trade	8	0.50	97.06
6311	Data processing, hosting and related activities	7	0.44	97.50
6312	Web portals	7	0.44	97.94
9002	Support activities to performing arts	5	0.31	98.25
9001	Performing arts	4	0.25	98.50
4649	Wholesale of other household goods	3	0.19	98.69
9319	Other sports activities	3	0.19	98.88
9321	<i>Activities of amusement parks and theme parks</i>	3	0.19	99.06
7490	<i>Other professional, scientific and technical activities n.e.c.</i>	2	0.12	99.19
9004	<i>Operation of arts facilities</i>	2	0.12	99.31
1813	<i>Pre-press and pre-media services</i>	1	0.06	99.38
2620	<i>Manufacture of computers and peripheral equipment</i>	1	0.06	99.44
4110	<i>Development of building projects</i>	1	0.06	99.50
4321	<i>Electrical installation</i>	1	0.06	99.56
4741	<i>Retail sale of computers, peripheral units and software in specialised stores</i>	1	0.06	99.62
4791	<i>Retail sale via mail order houses or via Internet</i>	1	0.06	99.69
4942	<i>Removal services</i>	1	0.06	99.75
6420	<i>Activities of holding companies</i>	1	0.06	99.81
7220	Research and experimental development on social sciences and humanities	1	0.06	99.88
8560	Educational support activities	1	0.06	99.94
9000	Creative, arts and entertainment activities	1	0.06	100.00