Mitteilungen der Österreichischen Geographischen Gesellschaft,
157. Jg. (Jahresband), Wien 2015, S. 51–70

Research in Progress on Constructing and Mapping an EU Knowledge/Information Base: Worlds of Gaps and Opportunities

Stanley D. Brunn, Lexington (KY), United States*

with 13 figures in the text

Contents

Zusammenfassung

Werkstattbericht über das Konstruieren und Kartieren einer EU-Wissens- und Informationsgrundlage: Welten von Lücken und Möglichkeiten

Gedenkanlässe wie der zur Erweiterung der Europäischen Union (EU) sind gute Gelegenheiten darüber nachzudenken, was wir über einen Gegenstand wissen und auf vernachlässigte und doch interessante Möglichkeiten zu stoßen, die Regionalwissenschafter, aber auch Sozial-, Politik- und Umweltwissenschafter aufgreifen könnten. Ich nütze diese Gelegenheit, um einer Reihe von Fragen zur Wissensgrundlage über die EU nachzugehen, generell der Frage, wie viel wir über Themen wissen, die für die EU in Gegenwart und Zukunft wichtig sind. Es gibt mehrere Indikatoren, die man zur Beantwortung dieser Fragen

* Stanley D. Brunn, Professor emeritus, Department of Geography, University of Kentucky, Lexington, KY 40506-0027, United States; email: brunn@uky.edu
The author wishes to thank the two reviewers for constructive comments on a previous version and also Richard Gilbreath, Director, Gyula Pauer, Cartography Laboratory, Department of Geography at the University of Kentucky, for making the colourful, aesthetic and attractive graphics.

heranziehen könnte, z.B. die Zahl von Büchern in Bibliotheken zu einem bestimmten Thema oder die Zitierhäufigkeit von entsprechenden Artikeln in Zeitschriften. Ich verwende Google, die große elektronische Datenbank, um den Umfang unserer Wissensgrundlage über die aktuellen und potenziellen Mitgliedstaaten der EU und mit dieser verbundene Themen wie ‚Grenzen' und ‚Einwanderung' zu ermitteln. Eine zweite Perspektive ergibt sich aus dem Blick auf Hauptstädte der EU-Staaten in Bezug auf ethnische Minderheiten, religiöse und sprachliche Vielfalt. Ich wähle diese Themen, weil sie für die im Gang befindlichen Diskussionen über Regulierungen und politische Vorgangsweisen wichtig sind. Ich stelle die Daten über Mitgliedsländer und Hauptstädte graphisch dar, weil es so leichter möglich ist, die Lücken zu erkennen, die im Wissen um diese Sachverhalte existieren. Sie sind in Form von Schemata gestaltet, die zwischen Kerngebieten, Semi-Peripherien, Peripherien und extremen Peripherien unterscheiden und nicht als Karten mit Staatsgrenzen, weil erstere die bessere Methode ist, unsere Wissensgrundlage in der Cyberwelt abzubilden. Denn die Grenzen der Cyberwelt sind fließend, dynamisch und ungleich. Es wird durch die Schemata klar, dass die geographische Wissensgrundlage sehr ungleich verteilt ist. Es gibt eine ansehnliche Wissensgrundlage über Mitgliedsländer und Hauptstädte, aber auch viel Ungleichheit und Unregelmäßigkeit. Die Wissensgrundlage weist Kerngebiete und Peripherien auf, auch einige ‚Wissensinseln' und ‚Wissensarchipele'. Diese Ungleichheit fordert zu weiterer Forschung heraus.

Schlagwörter: Geographie des Wissens, Cyberspace, Kartierung von Zentrum und Peripherie, Europäische Union

Summary

Commemoration events, such as those marking the enlargement of the European Union (EU), are opportune occasions to reflect on 'what we know' about a subject and to identify some neglected and challenging opportunities for scholars in regional studies as well as social, policy and environmental sciences. I use this occasion to look at a series of knowledge base questions, that is, how much do we know about certain topics that are important to the EU's present and future. There is a number of indicators one might use to answer this question, such as the number of library volumes on a certain topic or journal metrics. I use Google, the major electronic database, to examine the extent of our knowledge base about EU members and potential members and related topics, including boundaries and immigration, which are central themes in annual EU deliberations. A second perspective is gained by looking at our knowledge of EU capital cities vis-à-vis ethnic minorities, religious and linguistic diversity. I chose these issues as these are important in on-going discussions about regulations and policies. I map the member country and capital city data, because I think it is the appropriate method to see the extent of gaps in what we know about these topics. I preferred schematic graphics of cores, semi-peripheries, peripheries and deep peripheries to traditional maps with state borders we are all familiar with, because they are more appropriate to depict our knowledge about Europe's cyber worlds. Cyber boundaries are fluid, dynamic and uneven. From

these schemes, it becomes clear that the geographic knowledge base is very uneven. They reveal some consistency in our knowledge about member countries and capital cities, but also a fair degree of unevenness and irregularities. The EU knowledge world contains some cores and peripheries, but also some 'knowledge islands' and 'archipelagoes', which offer challenges for future scholars.

Keywords: knowledge geographies, cyberspace, core-periphery mapping, European Union

1 Introduction

From time to time, in the worlds of policy and scholarship it is important to take stock on 'what we know about what we study'. Such occasions are especially important and beneficial because they provide scholarly and policy communities for a time of reflection to think about not only the present, but challenges that lie ahead. All institutions and organisations have intellectual and policy histories that are worth revisiting to assess 'what we have done'. They do not exist in a vacuum, but in backgrounds of competing cultures, conflicts, politics and sometimes co-operating and competitive economies. Nor do such institutions and organisations stand still; very often before proceeding with initiatives, some benchmark analyses are called for.

This paper, basically an in-progress, is both reflective and prospective. The overriding question is straightforward: What do we know or how much do we know about the European Union? Information and knowledge are two related ingredients; information refers to what is published or produced or disseminated; knowledge relates to the value or use of specific information for policy purposes. The 'what information/knowledge' question raised above can be answered in different ways, for example, by the number of people impacted by European Union (EU) regulations and policies, the role of EU in the daily workings of state and local governments, the difficult challenges the EU members face regarding immigration, the rights of ethnic minorities, religious and ethnic diversity, environmental protection, data sharing, border security and transborder regional planning with non-EU members.

Similar questions about information/knowledge have been studied by others looking at knowledge production (Livingstone 2010), sustainability (Brunn 2014), world cities (Brunn et al. 2009, 2010, 2011), mountain regions (Brunn & Paradiso forthcoming) and networks of scientists (Wilson & Starkweather 2013).

A fundamental question that emerges with anyone trying to assess 'what we know?' is *where* can we or will we obtain the answer? We need to remember before attempting to answer that there is almost certainly no 'best' or 'single' answer to the question, but that as scholars and policymakers we need to provide some good estimate or barometer about *how much* we know and *what to know* about specific topics or individual EU member states or the EU itself.

A straightforward answer to the 'information question' might be to count the volumes of published materials, that is, how many books, reports, chapters and articles are produced. One could obtain this information from print and electronic libraries or databases

about EU history, economies, policies, regulations, etc. – then graph or tabulate that information by year or country or sub-region. The 'information' could be extended to include speeches, videos, films, photographs, maps and other official documents published by the EU and previous European regional organisations (European Coal and Steel Community, European Free Trade Association, European Communities, etc.), but also documents from individual member states. Amassing all this scholarly, governmental and intergovernmental printed material – or better stated – available print materials, would provide some indication about 'how much' we know about the EU past and present.

One might think that a visit to a major library and using its card or electronic catalogues will also provide some indication of the amount of materials available on a given topic or country. But libraries are generally depositories of printed materials, especially books, government reports and journals, which would likely represent only a small fraction of the total amount information published about a given topic or EU member.

One could also make the case that it would be useful to know about those cities, populations and territories affected by EU policies and regulations, for example, environmental quality, monetary policies, energy, immigration, land use planning, security arrangements, and foreign policies of the EU and individual member states. This information could be organised in tables and graphs by specific years or decades, which will help us understand where the EU *has been* and where the EU *is* regarding specific social, political, environmental, economic, cultural and political issues. And, as noted above, sometimes it is useful to have both 'benchmark' and futuristic information perspectives about (a) the EU itself, (b) the EU and individual countries, (c) EU capitals and (d) specific topics about member states.

2 Another useful knowledge source

Another potential source of information about any subject in today's digital world can be gained from electronic databases. These large search engines compile all kinds of information and provide a wide variety of materials for potential users located almost anywhere. Google is one such electronic search engine that generates billions of pieces of electronic information or hyperlinks that are available instantly to millions of users from multiple locations on the planet. Some of that information may be one or two pages, others several hundred electronic 'pages'. The information is available in different languages to individuals, companies, scholars, businesses, planners, courts, local and transnational non-governmental institutions and organisations within and outside the EU.

With respect to the EU queries specifically, one could literally discover how many millions or hundreds of millions of hyperlinks or 'electronic page' items are available by the click of a key about a general or specific subject on EU's history, individual EU countries vis-à-vis the larger organisation and the current status of EU policies regarding fishing, immigration, trade, monetary standing, regional planning as well as co-operation on security issues, space research and environmental legislation (ZOOK & GRAHAM 2007).

In the Google Search Engine there are two distinctly different databases one can access to learn about 'what we know' about an individual subject or topic or geographic unit. One is the generic Google Search Engine, which contains items from many different sources: government reports, scholarly journals, press releases, unpublished and published reports, accounts by individuals, etc. This generic source could be used to just learn about the sheer volume of information about an individual subject or place/region.

The second database is Google Scholar, which includes books, chapters, monographs and articles from scholarly journals. The volume of information about a given subject is usually much less for the Google Scholar database than for the generic Google Search Engine and for this reason it is often used by scholars wishing to know what scholarly materials have been published recently on a given topic (Brunn 2014).

Both Google databases, it should be mentioned, rank the items listed. The formula used to rank entries is an industry trade secret. It is not based solely on the number of hyperlinks associated with an entry or how many times an item has been downloaded, but more likely on a combination of the quality of the report or journal and the item's citation in other sources (Brin & Page 1998).

Both the Google Search Engine and Google Scholar can be used to provide barometers or databases of what and how much we know about a given subject. Granted that it is electronic information and that the bits or bytes of information or 'pages' are electronically stored, they are available, almost literally, to almost anyone anywhere instantly. Rather than having book and/or journal knowledge stored in some national library in Strasbourg or Brussels [Bruxelles/Brussel] or some huge library in a large city in Germany, France or the United Kingdom, the location is in 'cyberspace', which means that the Search Engine is available to anyone. It is 'stored' in cyberspace and made available to those using computers in laptops, iPads, apps, homes, offices, libraries, laboratories, schools, hotel rooms, or literally almost anyone anywhere who wishes to have access to the desired information. One can/could access this information in this database 24/7, that is, anytime and from any location provided there are no language, monetary or geopolitical filters.

3 The EU and Google

Returning to the question asked at the outset, we can develop a database about the EU by examining at the volume of hyperlinks associated with (a) the EU generally or (b) an EU member state or (c) an EU member and some selected topics such as labour migration and water quality for selected cities in the EU. One could enter into the search bar for the generic Google Search Engine or the scholarly Google Scholar the following entries: (1) European Union, which would generate the volume of hyperlink information available in multiple languages, (2) European Union + a member state, such as, European Union + Austria, European Union + Portugal, European Union + Bulgaria, etc. and be provided the number of hyperlinks or electronic information pieces associated with this word organisation-country combination; (3) the European Union and a capital city, for example, European Union + Dublin or European Union + Athens and (4) the European Union + a country name + selected topics, for example, European Union + Ireland + boundaries or

European Union + Germany + immigration or European Union + Belgium + religious diversity. These data could become a basis for discussing countries and issues or as information on graphs and maps.

In any database, word documents or narratives are only partial sources of information about a given topic. We could expand our search and focus specifically on visual information, that is, maps, charts, graphs and photographs (TURNBULL 1996; CRAMPTON 2001). The visual world remains an important element of how much we know about a contemporary policy. Countries, including those in the EU and others, are aware of the growing importance of the 'geopolitics of the visual' in presenting themselves (the leaders, their populations, their initiatives, etc.) in the best light, not only to their own constituents, but also for other EU members and non-EU countries in a larger regional or global context.

In order to highlight the importance of 'the visual' I have developed databases of EU members and the number of maps and photographs, for example, European Union + Spain + maps, European Union + Estonia + maps, etc. and also European Union + Italy + photographs, European Union + Poland + photographs, etc. The maps in the databases could be of land uses, languages, social classes, immigrant groups, border crossings, tourist sites, transportation routes, agricultural and industrial production, education levels and bank deposits. The photographs could be of religious and secular holidays, school events, farmers and industrial workers, tourist heritage sites, natural disasters, cultural conflicts, conferences of non-governmental organisations and gatherings of political leaders.

A further comment is in order before proceeding with the analysis: The number of and the ranking of items in any search changes almost hourly. Thus the volume of hyperlinks about an individual country or a given topic can and often will change by the minute. In this regard the situation is not completely unlike the books or documents or maps in a library's electronic catalogue or journals that a library receives. These entries would also change daily and probably hourly.

4 Methodology

I used Google Search Engine and Google Scholar to generate hyperlink databases for all EU member states, associate members and those likely to become part of the EU at some future time. Altogether 41 countries were included in the database. Data were collected between 28–30 January and 11 February 2015. Data are about hyperlink volume, not the length or 'pages' of an individual hyperlink, which may be less than a handful of pages to several hundred. One should not confuse the number of hyperlinks with the importance of a country, as a small country may have few hyperlinks or pages compared to a medium-sized country, which may have many more.

For individual countries I accessed the number of entries dealing with boundaries, immigration, and terrorism as these are important topics for individual EU countries and also regional conferences. I also entered ethnic minorities, religious diversity and linguistic diversity for capital cities as these are topics and challenges that face many cities, large and small, old and new member states. I also examined two additional features about EU

documents for countries, namely, maps and photos. These entries are not only inserted in reports, articles and books by governmental and intergovernmental organisations, but those appearing in scholarly sources.

Mapping knowledge results

Once I had identified, which countries and which cities would be in each category (country or city or subject) for the above maps, I faced a decision: How to represent those in some meaningful way. I initially considered using a traditional map of European countries with national boundaries and shading in what country belonged to which of the four 'regional' categories: East Europe, West Europe, Mediterranean Europe and Northern Europe. But that map projection, as noted above, seems to mean less and less when discussing EU or trans-European interests, or when regional issues and policies are the focus. Countries are just places on a map and in an electronic-knowledge based map, traditional land boundaries mean nothing (or next to nothing) as all information is in cyberspace. Where Finland is and where Albania is or where Dublin [Dublin/Baile Átha Cliath] is or Budapest is not the paramount issue in a fluid, dynamic and rapidly changing continent, where regional issues often trump individual country positions on an issue.

With these reservations in mind, I prepared a set of graphics based on a series of concentric circles that identified countries belonging to a core, a semi-periphery and peripheries (two categories). The four 'regions' or 'cyber regions' that I identified and mapped may not be labels familiar to many scholars and government officials, who are more used to maps showing Mediterranean Europe or Baltic Europe or Eastern Europe. The 'Core-Periphery' labels are familiar to most policy scientists who study world systems, except the fourth, which I added. This region refers to those countries that have the fewest hyperlinks, which are often many fewer than those shown in the Periphery. These categories are reflective of the volumes of information we have about individual countries and cities in a digital age than placing names on maps showing centuries' old or even recent political boundaries. The Periphery or Deep Periphery location of a country does not reflect its importance in a larger EU context as there are some small countries such as Liechtenstein and Slovenia that may be in the Periphery 'zones', but are much integrated into neighbouring EU countries. What country is next to what other country is not a relevant question nor is the shape of a country, land boundary length or a central or peripherical location of the national capital.

I used the same reasoning in classifying cities. Cities, and countries for that matter, in an electronic-knowledge world can be considered as a series of points or nodes in cyberspace. Where they are with respect to each other in a cyberspace world means little sense; directions mean nothing and neither does whether a city is on a coast or on a major river or along an international border. What is important in a knowledge/information geography inquiry is the volume of information, in this case electronic information, available about a given city. All cities in the EU are networked in some sense with all others as well as many EU institutions, organisations and offices. One needs to visualise this cyber worlds by a very complex network of connections linking these cities; with much higher densities of connections in the Core and semi-Periphery than in the Deep Periphery. On

the schemes below the cities are just placed arbitrarily within the regional category they are grouped.

Again, while these schemes may be uncomfortable and possibly even upsetting to some social and policy scientists, EU administrators and NGOs, it is important to remember that in cyber worlds, where huge volumes of information are reported, collected, graphed, mapped, translated, accessed and disseminated with speed and with ease, what country actually borders another country often makes little sense, when we are discussing issues that affect most EU states on a daily basis. This thinking applies to labour migration, data security, refugee flows, environmental hazards, transborder traffic, science policies and funding, money transfers, cybercrime and the spread of diseases. These knowledge data are important for many individuals, businesses, universities, hospitals, organisations and governments, and much more important than agricultural and industrial production, massive construction projects, river traffic and tourist flows.

I initially prepared all the topic and country entries both using Google Search Engine and Google Scholar, but eventually decided to focus primarily on Google Scholar data for EU cities as they are more representative of scholarly and policy literature on a specific topic. I include some graphs comparing the differences in hyperlinks between the two databases.

These are the 13 schemes I prepared:

1. Total number of Google hyperlinks for all member states and others.
2. Total number of Google Scholar hyperlinks for all member states and others.
3. Total number of Google hyperlinks for capital cities of all member states and others.
4. Total number of Google Scholar hyperlinks for capital cities of all member states and others.
5. Total number of Google Scholar hyperlinks for all member states and others that relate to boundaries.
6. Total number of Google Scholar hyperlinks for all member states and others that relate to immigration.
7. Total number of Google Scholar hyperlinks for all members states and others that relate to terrorism.
8. Total number of Google Scholar hyperlinks for capital cities related to ethnic minorities.
9. Total number of Google Scholar hyperlinks for capital cities related to religious diversity.
10. Total number of Google Scholar hyperlinks for capital cities related to linguistic diversity.
11. Total number of Google Scholar hyperlinks of all member states and others about maps.
12. Total number of Google Scholar hyperlinks of all member states and others about photos.
13. Composite ranking of Google Scholar data for all member states and others and EU capitals and other cities.

5 Results

5.1 Numerical results: Total number of hyperlinks

- European Union + 41 countries: 3 billion – Google **(Fig. 1)** but only 27.3 million – Google Scholar **(Fig. 2)**;
- European Union capitals of 41 countries: 697 million – Google **(Fig. 3)**; 8.3 million – Google Scholar **(Fig. 4)**;
- Countries + Boundaries: 5.9 million – Google Scholar **(Fig. 5)**; most hyperlinks Germany (815,000), Netherlands (476,000) and France (415,000);
- Countries + Immigration: 3.45 million – Google Scholar **(Fig. 6)**; most hyperlinks United Kingdom (303,000); Germany (252,000) and Spain (202,000);
- Countries + Terrorism: 2.5 million; most hyperlinks United Kingdom (303,000); France (267,000) and Germany (252,000);
- Countries and Terrorism: 2.6 million – Google Scholar **(Fig. 7)**; most hyperlinks France (237,000); Germany (234,000);
- Capitals + Ethnic Minorities: 1 million – Google Scholar **(Fig. 8)**;
- Capitals + Religious Diversity: 2.6 million – Google Scholar **(Fig. 9)**;
- Capitals + Linguistic Diversity: 1 million – Google Scholar **(Fig. 10)**;
- Countries + Maps: 3.8 million – Google Scholar **(Fig. 11)**; most hyperlinks France (528,000) and Germany (458,000);
- Countries + Photos: 1.3 million – Google Scholar **(Fig. 12);** most hyperlinks France (106,000); Germany (92,000);
- Composite ranking of Google Scholar data for European Union and other countries **(Fig. 13A)** and capitals **(Fig. 13B)**.

5.2 Salient facts about EU countries and capitals

For all countries and all capitals there were more hyperlinks using generic Google Search than Google Scholar:

Countries with most hyperlinks, Google Search: France (138 million), Germany (129 million), Spain (123 million), United Kingdom (119 million), Italy (116 million), Ireland (113 million), Netherlands (111 million); middle-ranked countries, Google: Romania, Estonia, Luxembourg;

Countries with most hyperlinks, Google Scholar: Germany (2.54 million), France (2.47 million), Italy (2 million), Spain (1.9 million); middle-ranked countries, Google Scholar: Norway, Denmark, Hungary; middle-ranked capital cities, Google: Kiev [Kiïv], Prague [Praha], Oslo; middle-ranked capital cities, Google Scholar: Lisbon [Lisboa], Warsaw [Warszawa], Budapest;

Countries with most hyperlinks about **boundaries**, Google Scholar: Germany (815,000), Netherlands (476,000), France (415,000); middle-ranked countries: Portugal (145,000), Finland (131,000), Hungary (129,000); lowest-ranked countries: Moldova (19,000), Liechtenstein (10,000). There were more hyperlinks for the top three countries (listed above) than the next five leading countries combined.

Countries with the most hyperlinks about **immigration**, Google Scholar: United Kingdom (303,000), France (267,000), Germany (252,000); middle-ranked countries: Israel (85,000), Hungary (80,000), Norway (77,000); lowest-ranked countries: Macedonia (22,000), Moldova (16,500), Liechtenstein (8,300). There were more hyperlinks for the top three countries than the next five leading countries combined.

Countries with most hyperlinks about **terrorism**, Google Scholar: France (237,000), Germany (234,000); middle-ranked countries: Denmark (55,000), Hungary (55,000), Portugal (55,000); lowest-ranked countries: Malta (21,000), Moldova (17,000), Liechtenstein (6,500). There were more hyperlinks for the top two countries than the next three combined. Dominance of Germany and France: They had 33% of all maps and 22% of all photos; each had five times more maps than photos; many other countries had two or three times more maps than photos.

Ethnic minorities: The hyperlink volumes for London were the largest; it had more than the next 5 cities combined: Paris, Rome [Roma]; Madrid, The Hague ['s-Gravenhage] and Athens [Athénai]. London had 34% of all hyperlinks about ethnic minorities, 22% on religious diversity and 30% on linguistic diversity in the Google Scholar database. Other cities with very few hyperlinks about minorities were Prishtina [Prishtinë/Priština], Chisinău, Valletta [Valletta/il-Belt Valletta], Skopje and Tirana [Tiranë]. Nicosia [Lefkosía/Lefkoşa], Reykjavik and Ljubljana had a few more.

Religious diversity (RD) and linguistic diversity (LD): 15 capitals had more LD hyperlinks: Vilnius, Tallinn, Bratislava, Ljubljana, Riga [Rīga], Valletta, Ankara, Vienna [Wien], Reykjavik, Ankara, Tel Aviv [Tel Aviv-Yafo/Tel Aviv], Chisinău and Kiev – most of these were small populated cities; 24 had more RD: Berlin, Paris, London, Rome, Athens and Brussels – the largest capitals; 9 had nearly the same numbers for RD and LD: Warsaw, Lisbon, Helsinki [Helsinki/Helsingfors], Budapest, Sofia [Sofija], Luxembourg, Berne [Bern], Oslo, Tirana, Sarajevo, Skopje and Belgrade [Beograd].

Similar numbers for ethnic minorities (EM) (1 million) and language diversity (LD) (1.1 million): More EM for London, The Hague, Helsinki and Budapest; more LD for Paris, Berlin, Brussels and Dublin; basically the same for Rome, Madrid, Stockholm, Vienna, Lisbon, Athens, Copenhagen [København], Sofia, Luxembourg, Oslo, Kiev, Berne and Bratislava.

Countries with the most hyperlinks about **maps**: There were more for the top two countries than the next three combined (Italy, Netherlands, Spain).

Countries with the most hyperlinks about **photos**: There were more for the two top countries than the next three combined (Italy, United Kingdom, Spain).

6 Future research directions

The schemes and tabular data suggest that there are many topics about the 'EU information/knowledge base' that merit attention by scholars and others. Let me suggest seven topics I think hold promise.

First is to look at the EU links with other major cities, including small cities and towns in the EU as a whole or for individual countries. For example, what are the hyperlinks for

cities of 75,000 or 25,000 in Sweden or Poland or Portugal or Slovakia – or for port cities, university cities, tourist cities and old and new industrial cities?

Second, a closer look at issues about ethnic minorities, religious and language diversity would also merit closer attention not only in the very large cities in the EU, but also in smaller cities and in gateway and transborder cities.

Third, one could more closely examine the leading websites for individual countries and large cities and small cities. Google has developed an algorithm that ranks the websites in order of quality and importance. It would be very interesting to know the overriding themes of the highest-ranked hyperlinks. Are they related to economic development, tourism, immigration issues, security threats, geopolitical issues or regional planning? Are the ranked sites different for Denmark, Ukraine and Bulgaria than Ireland, Sweden and Slovenia? Are the web pages for Brussels, Paris and Rome different than for Athens, Madrid, Vienna and Berlin?

Fourth, it would also be worthwhile to look at how these entries and rankings of countries, cities and websites change over time. For example, how different would the results of this study be if we used the same methodology in 1990, 2000 or 2010 or even 2025? Would the rankings and the categories of cities in the cores, semi-peripheries and peripheries be the same or would they be different? And, if so, what differences? And what would be the reasons for a shift to a different ranking? Would major internal or regional security, environmental, immigration and economic changes affect these rankings?

Fifth, what are the most popular topics for maps and photos? Are they about agriculture, industrial output, environmental quality, cultural diversity, political leaders or transborder initiatives?

Sixth, it would be worth exploring whether these English hyperlink numbers, subject matter categories and rankings of EU countries and capitals are different when using French, Spanish, German, Italian or other EU languages. One would expect the numbers would be somewhat different, but the extent of those differences is unknown at this point.

Seventh, one needs to be aware of the extreme sensitivity of some topics in some countries; for example, immigration and monetary policy are two delicate EU issues in the first half of 2015.

In this contribution, I have provided both a narrative and visual representations about our information on the EU. Those results are far from complete as there remain many gaps in our knowledge and understanding about some subjects and countries. We still do not know much about many countries, especially small countries, their capital cities, their economic centres, their university cities, their tourist destinations, etc. Until we acquire and analyse that information, our knowledge about Sweden, Slovakia, Slovakia and Serbia, for example, will be incomplete as will certain topics about Brussels, Vienna, Kiev and Lisbon.

One further point regarding the data used above merits brief attention. We are discussing the amount or volume of information available on a major electronic search engine about countries, cities and selected topics. We should not confuse these numbers with the 'importance' of a country or capital or even a given topic or even a position of a country or city on a graphic. While it might be tempting to assume that those countries and capital cities with the most hyperlinks are, by their sheer numbers, the 'most important', that reasoning might

be flawed. What are 'the most important cities in the EU' and 'the most important EU countries' is not the purpose of this article. I will leave for others to discuss what are 'the' most important countries and cities as they may use other criteria than an electronic database.

This effort is a 'first attempt' to provide members of the EU scholarly communities, EU governments and administrative units, IGOs and NGOs with a numerical and graphical database to explore further our text (or narrative), photographic and cartographic databases. These are rich sources of information to help us understand and solve the ground problems at local and regional scales. We need to extend our knowledge beyond the EU cores and semi-peripheries, shown so clearly on the graphics, to the EU's peripheries and deep peripheries. People live there, go to work, raise families, make love, worship and celebrate their heritages. These are not the Brussels, Londons and Parises of the EU, but are integral parts of this large regional economic and political union. These are the Bratislavas, the Copenhagens, the Zagrebs, the Helsinkis and the Rigas. The EU cultural community is one that deserves just as much attention as the economic, monetary and political communities. As the graphics about boundaries, ethnic minorities, immigration, terrorism, religion and linguistic diversity illustrate, there is vast unevenness in what we know or rather, what we do not know. This unevenness extends to our map and photograph databases.

In closing I wish to issue a challenge to governments, governmental units, nongovernmental organisations and members of the many scholarly communities within and outside the EU to begin tasks to help us reduce some of the information and knowledge gaps about the EU and beyond. These terrae incognitae have been referred to as "the geographies and cartographies of silence" (WRIGHT 1947; BRUNN & WILSON 2013). These gaps can/might be narrowed by (a) awarding research grants to scholars and NGOs in understudied cities, countries and regions, (b) financially supporting transborder and regional conferences devoted to common social, political and environmental themes and (c) publishing the research of scholars teaching and conducting research in periphery and deep periphery universities and research units. Future generations will be watching carefully what scholarly and policy communities do, how they conduct both research and policy that contributes to improving the quality of life and living of those within and outside EU borders. Regional and local issues of governance, development, quality of life and political representation will continue to be major themes for scholarly inquiry, planning and governmental policies as well as local and regional policies (JONES & KEATING 1995; MARKS et al. 1996; JEFFREY 1997; BRENNER 1999; BRETHERTON & VOGLER 1999; DINIAN 2005; GROS & THYGESEN 1992; HIX & HØYLAND 1999; KOHLER-KOCH & EISING 1999; NUGENT 2003; BARTOLINI 2005; ZIELONKA 2006).

7 References

BARTOLINI S. (2005), Restructuring Europe: Centre Formation, System Building and Political Structuring Between the Nation-State and the European Union. Oxford – New York, Oxford University Press.

BRENNER N. (1999), Globalisation and Reterritorialisation: The Re-Scaling of Urban Governance in the European Union. In: Urban Studies, 30, 2, pp. 421–451.

BRETHERTON C., VOGLER J. (1999), The European Union as a Global Actor. New York, Routledge.

Brin S., Page L. (1998), The Anatomy of a Large-Scale Hypertextual Web Search Engine. In: Computer Systems and ISDN Systems, 30, pp. 107–117.

Brunn S.D. (2014), Cyberspace Knowledge Gaps and Geographical Boundaries in Sustainability Science: Topics, Regions, Editorial Teams and Journals. In: Sustainability, 6; pp. 6576–6603. Doc10.3990/su6106576.

Brunn S.D., Boulton A., Derudder B., Witlox F. (2009), Major Cities in the Information World. Monitoring Cyberspace in Real-Time (= Globalization in World Cities Research Bulletin, 308). – *http://lboro.ac.uk/gawc/rb/rb308.html* (last access: 30.11.2015).

Brunn S.D., Devriendt L., Boulton A., Derudder B., Witlox F. (2010), Networks of European Cities in Worlds of Global Economic and Environmental Change. In: Fennia, 199, pp. 37–49.

Brunn S.D., Devriendt L., Boulton A., Derudder B., Witlox F. (2011), Searching (for) Cyberspace: the Position of Major Cities in the Information Age. In: Journal of Urban Technology, 18, pp. 73–92.

Brunn S.D., Wilson M.W. (2013), Cape Town's Million Plus Black Township of Khayelitsha: Terrae Incognitae and the Geographies and Cartographies of Silence. In: Habitat International, 30, pp. 1–11.

Brunn S.D., Paradiso M. (forthcoming), Mapping and Met Measuring Digital Divides in Mountain Regions: Global and Local Knowledge and Silences. In: Kingsolver A., Balasundaram S. (eds.), Comparative Mountain Regions. Lexington, University Press of Kentucky.

Crampton J. (2001), Maps as Social Construction: Power, Communication and Visualization. In: Progress in Human Geography, 25, pp. 235–252.

Dinian D. (2005), Ever Closer Union. An Introduction to European Integration. Boulder (CO), Lynne Rienner.

Gros D., Thygesen N. (1992), European Monetary Integration. London, Longman.

Hix S., Høyland B. (1999), The Political System of the European Union. London, Palgrave Macmillan.

Jeffrey C. (1997), The Regional Dimension of the European Union: Towards a Third Level in Europe? London, Frank Cass.

Jones J.B., Keating M. (1995), The European Union and Its Regions. London – New York, Oxford University Press.

Kohler-Koch B., Eising R. (1999), The Transformation of Governance in the European Union. London, Routledge.

Livingstone D.M. (2010), Landscapes of Knowledge. In: Meusburger P., Livingstone D.N., Jöns H. (eds.), Geographies of Science, pp. 3–22. Dordrecht, Springer.

Marks G., Scharpf F., Schmitt P., Street W. (1996), Governance in the European Union. London, Sage.

Nugent N. (2003), The Government and Politics of the European Union. London, Palgrave Macmillan.

Turnbull D. (1996), Cartography and the Science of Early Modern Europe: Mapping the Construction of Knowledge Spaces. In: Imago Mundi, 68, pp. 5–24.

Wilson M.W., Starkweather S. (2013), Web Presence of Academic Geographers: A Generational Divide. In: The Professional Geographer, 66, pp. 73–81.

Wright J.K. (1947), Terrae Incognitae: The Place of the Imagination in Geography. In: Annals of the Association of American Geographers, 37, pp. 1–15.

Zielonka J. (2006), Europe as Empire: The Nature of the Enlarged European Union. New York – Oxford, Oxford University Press.

Zook M., Graham M. (2007), The Creative Construction of the Internet: Google and the Revitalization of Cyberspace and Digiplace. In: Geoforum, 30, pp. 1322–1341.

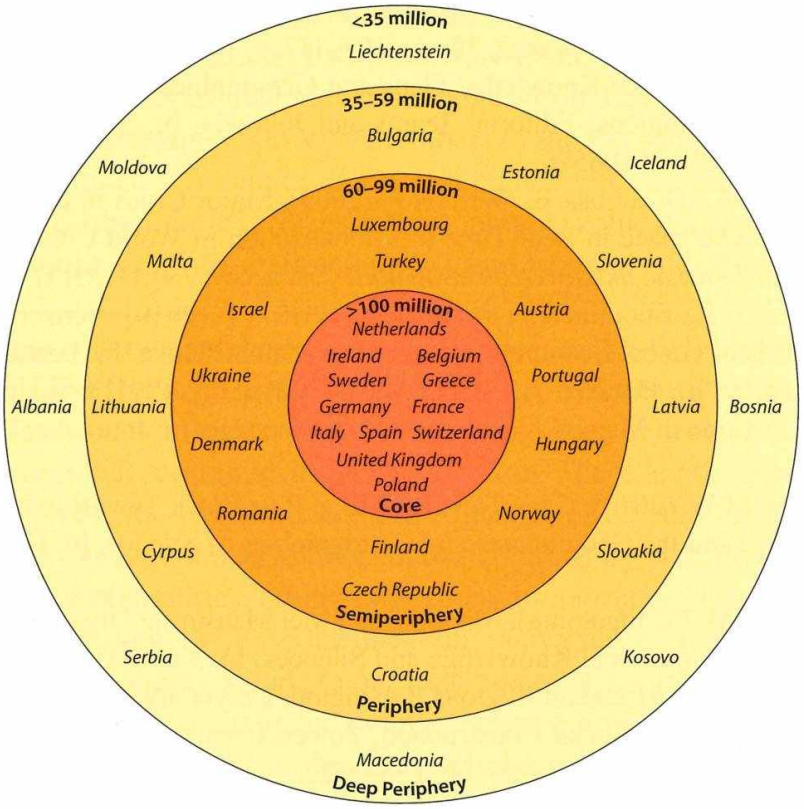

Fig. 1: Total number of Google hyperlinks for all member states and others

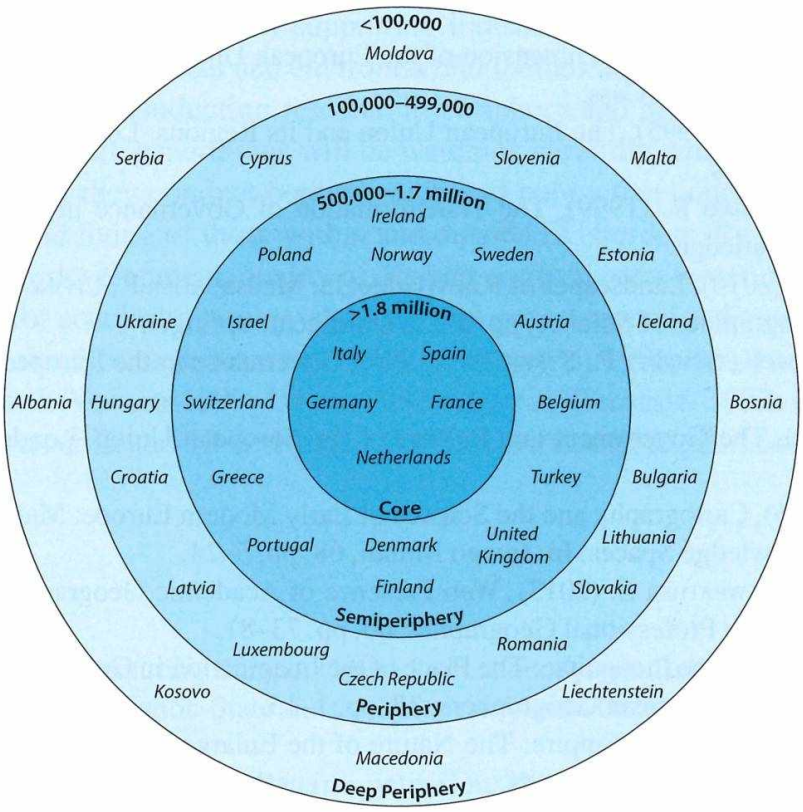

Fig. 2: Total number of Google Scholar hyperlinks for all member states and others

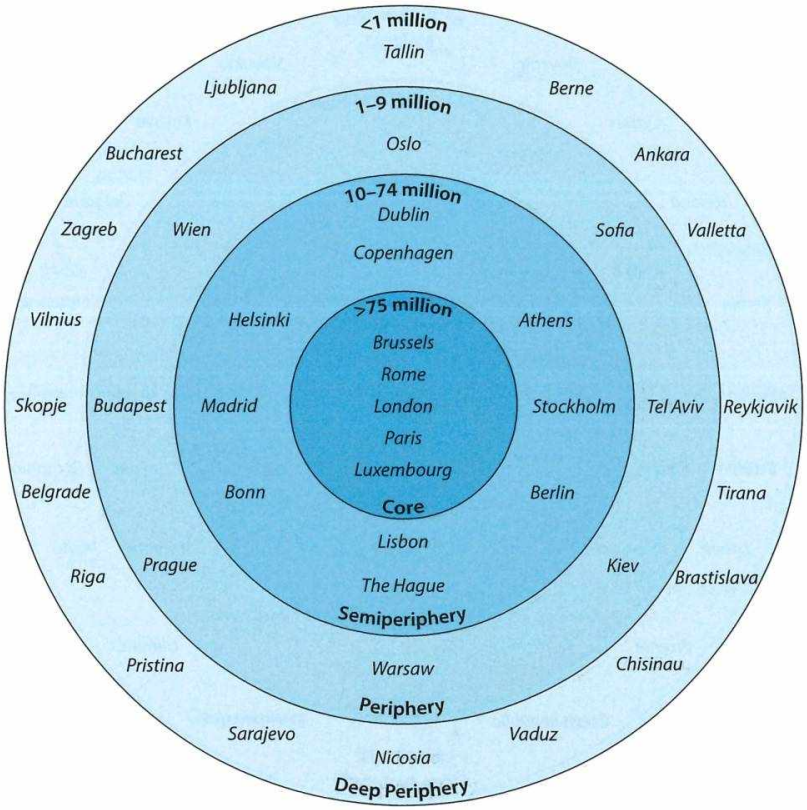

Fig. 3: Total number of Google Hyperlinks for capital cities of all member states and others

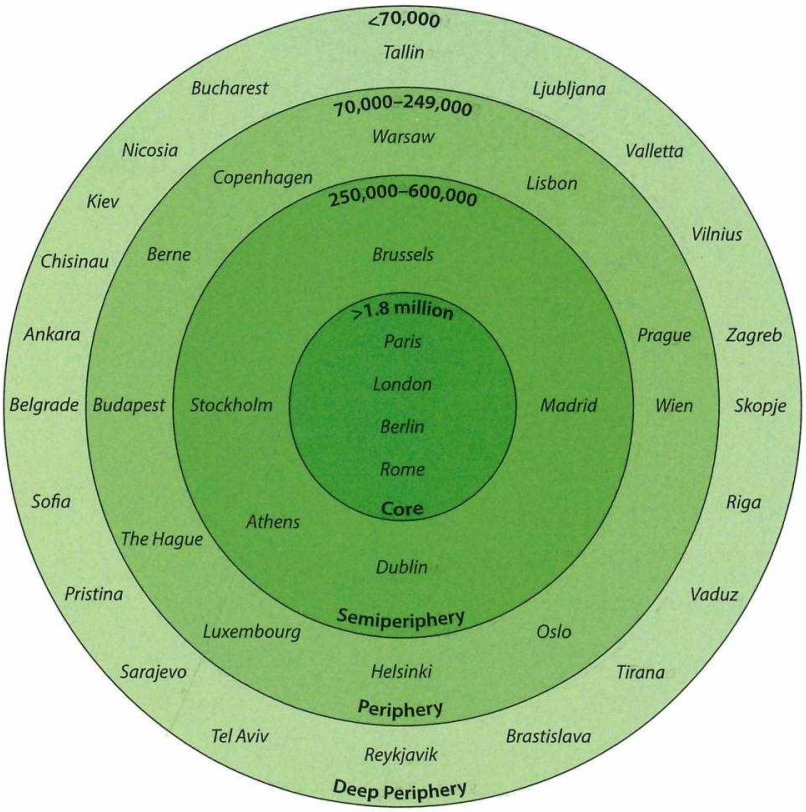

Fig. 4: Total number of Google Scholar hyperlinks for capital cities of all member states and others

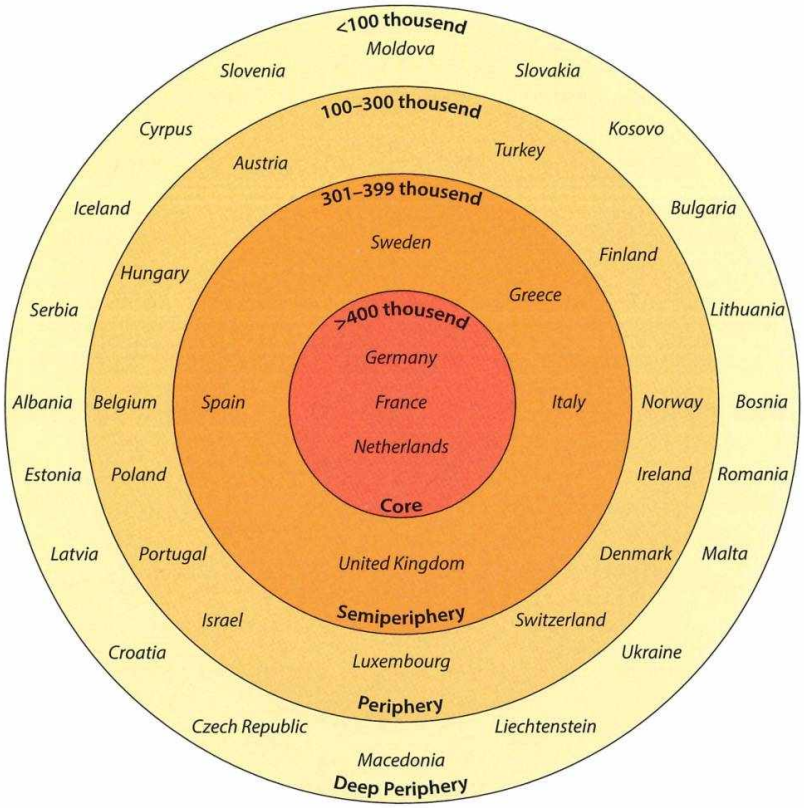

Fig. 5: Total number of Google Scholar hyperlinks for all member states and others that relate to boundaries

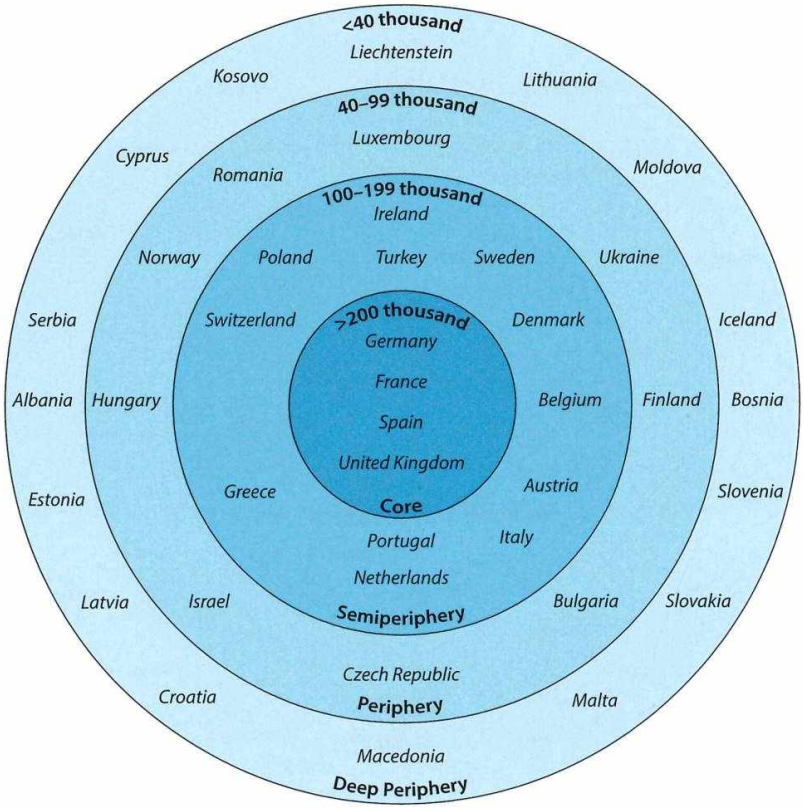

Fig. 6: Total number of Google Scholar hyperlinks for all member states and others that relate to immigration

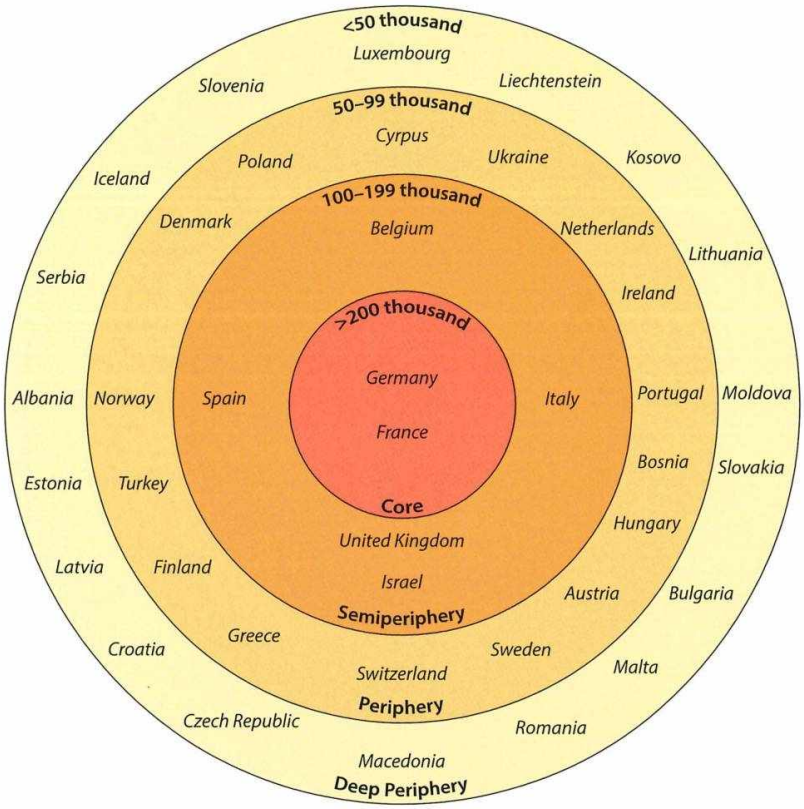

Fig. 7: Total number of Google Scholar hyperlinks for all members states and others that relate to terrorism

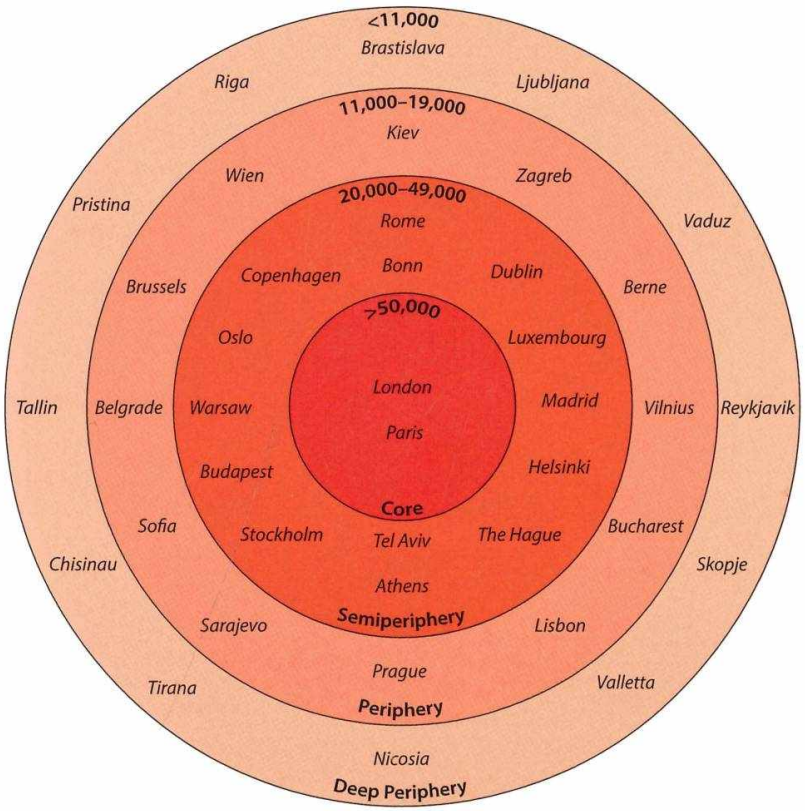

Fig. 8: Total number of Google Scholar hyperlinks for capital cities related to ethnic minorities

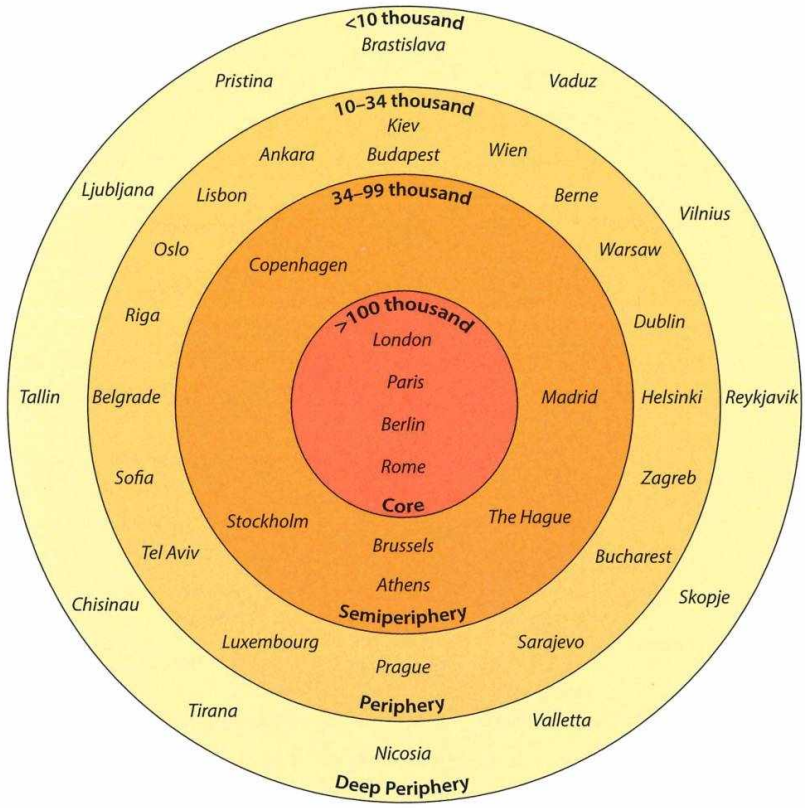

Fig. 9: Total number of Google Scholar hyperlinks for capital cities related to religious diversity

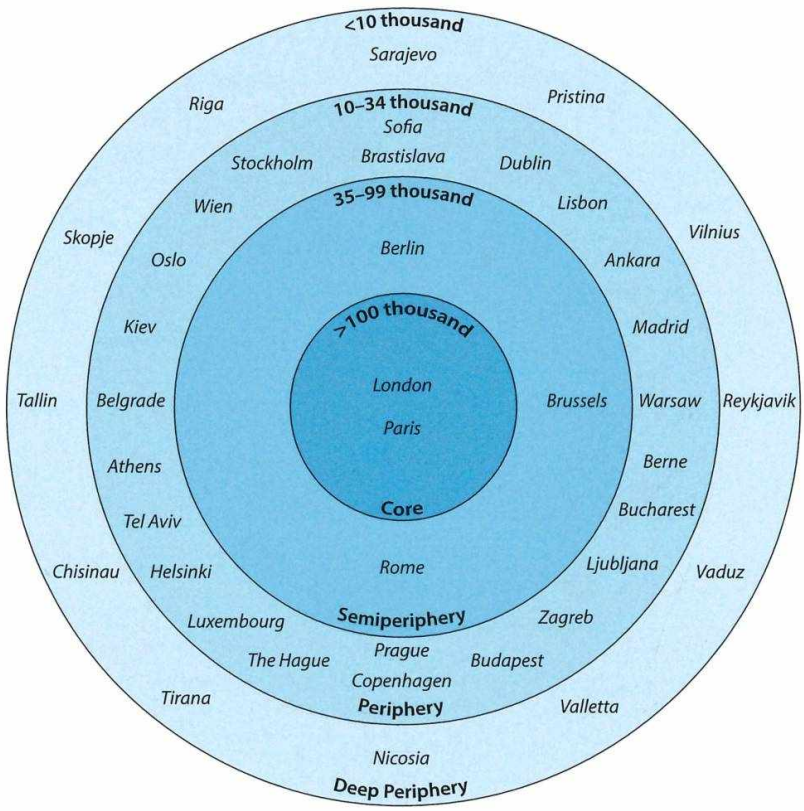

Fig. 10: Total number of Google Scholar hyperlinks for capital cities related to linguistic diversity

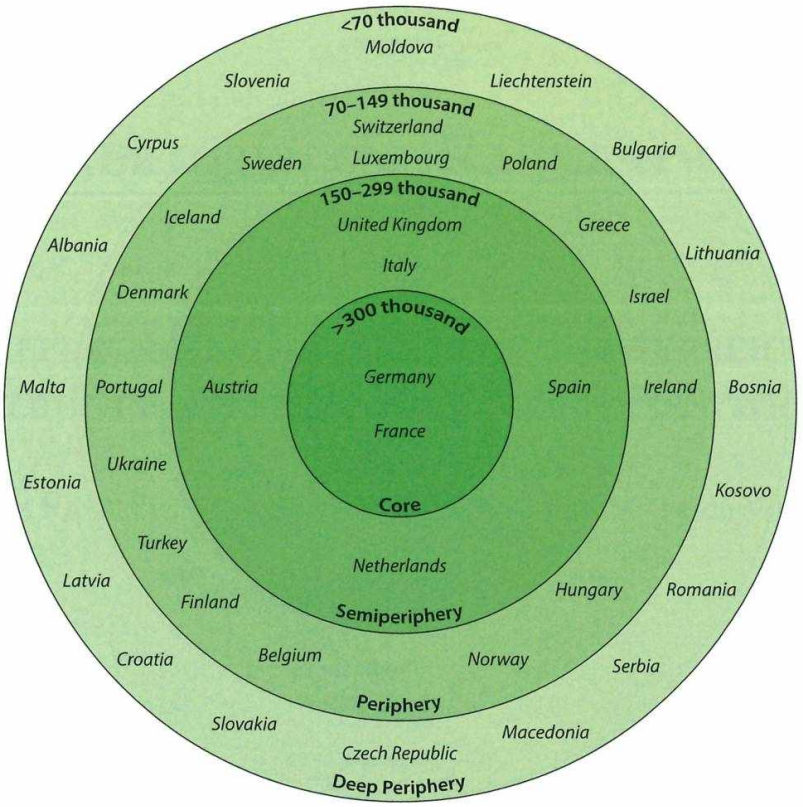

Fig. 11: Total number of Google Scholar hyperlinks of all member states and others about maps

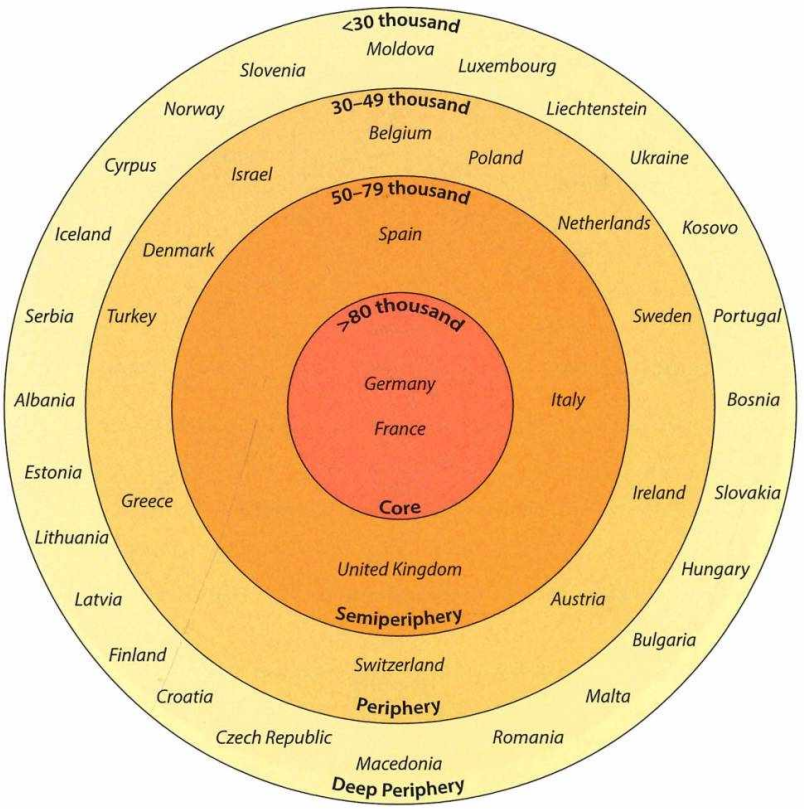

Fig. 12: Total number of Google Scholar hyperlinks of all member states and others about photos

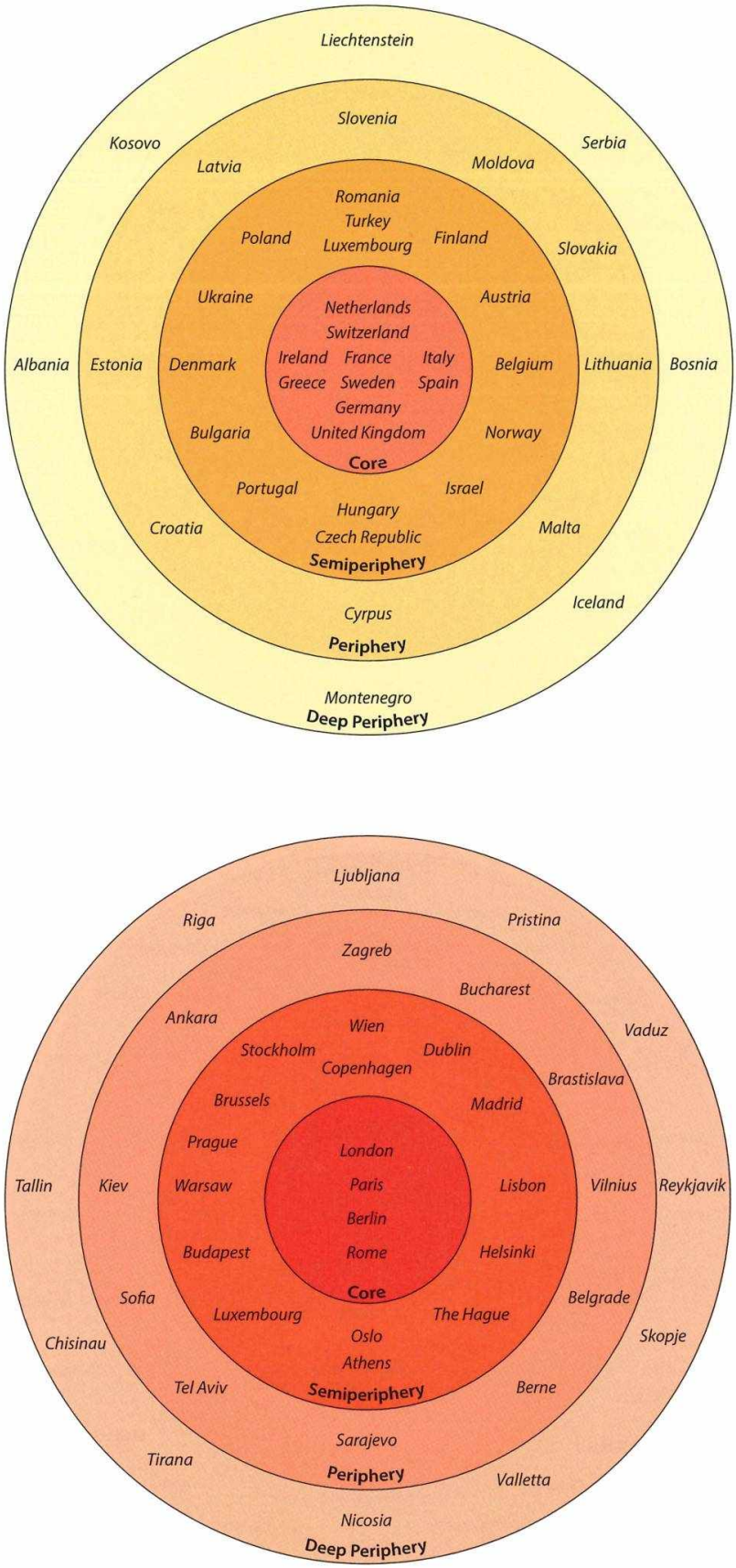

Fig. 13: Composite ranking of Google Scholar data for all member states and others and EU capitals and other cities

knowledge/information base: Worlds of gaps and opportunities 51-70