EUROPEAN TERTIARY EDUCATION REGISTER

What ETER is...

... a European Commission database initiative collecting information on Higher Education Institutions (HEIs) in Europe

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The regional structure of European Higher Education

European Tertiary Education Register

The ETER project, 2019

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The regional structure of European Higher Education

European Tertiary Education Register

Expanding the geographical coverage of higher education is an important means to achieve two key objectives of the European Union Agenda for Higher Education. On the one hand, a broader geographical coverage lowers costs and barriers for student's access to higher education, particularly for pupils from lower social classes that are more penalized by the need to move to another region. On the other hand, higher education is an essential component of the formation of human capital, which is largely recognized as a major determinant of productivity and growth.

In this respect, ETER can be used to examine the contribution of different types of Higher Education Institutions and of satellite campuses to the regional distribution of higher education. Results show that, in 2016, 59% of the NUTS 3 European regions, comprising 79% of the population and 75% of the surface of Europe, hosted at least one main seat of a Higher Education Institution. Additionally, more than 250 NUTS 3 regions (out of 1,700), containing about 15% of the EU population, are served only by satellite campuses, showing how their creation is a powerful tool to improve accessibility to higher education. Non-university institutions also significantly raise the share of European regions offering higher education and substantially increase the density and diversity of supply in densely populated areas. This process took momentum from the 1970s onward, when the diffusion process of universities started to slow down. At the same time, the research function of higher education, as approximated by the number of PhD students, remains highly concentrated in large cities.

This report therefore shows how public policies mobilized different strategies to increase accessibility of higher education at the regional level, while keeping resources and research activities concentrated in the metropolitan areas. First, the creation of regional universities outside the main cities, then the establishment (or consolidation) of Universities of Applied Sciences, as regional hubs for education and, increasingly, societal and economic outreach. Finally, the establishment of satellite campuses as a way to provide education at the regional level, while sharing human resources and infrastructures over the whole institution.

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Key findings

ETER can be used to examine the contribution of different types of Higher Education Institutions and of satellite campuses to the regional distribution of higher education.

Overall regional coverage

- In 2016, 59% of the NUTS 3 European regions, comprising 79% of the population and 75% of the surface of Europe, hosted at least one main seat of a Higher Education Institution.

The contribution of non-university institutions

- In many countries, non-university institutions raise the share of NUTS 3 regions which offer higher Education by between 10% and 35%.
- This contribution is highest in countries with a dual higher education system (like Germany, Switzerland and the Netherlands) and in some Central European countries (e.g. Hungary and the Czech Republic).
- Non-university institutions substantially increase the density and diversity of higher education supply in both densely populated areas as in peripheral regions.
- Non-university institutions provide mostly education and human capital formation, while the research function of higher education remains concentrated in large cities.

The contribution of satellite campuses

The creation of satellite campuses by established institutions is a powerful tool to improve accessibility to higher education in European regions.

- 22% of universities and 29% of Universities of Applied Sciences have a satellite campus in another NUTS 3 region than the main campus.
- More than 250 NUTS 3 regions (out of 1,700), containing about 15% of the EU population, are served only by such satellite campuses.
- EU Member States with a „dual higher education system“ like Germany, Austria, the Netherlands, Denmark, Belgium and Switzerland have a relatively high share of non-university institutions with a satellite campus.

Historical dynamics

- The number of NUTS3 regions hosting the main seat of higher education institutions almost tripled since the beginning of the 19th century.
- The creation of new universities has slowed down in recent decades from the 1980s.
- From the 1970s, the establishment of non-university institutions and the creation of satellite campuses has become an alternative way to expand the coverage of higher education provision across European regions.

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1. This report

This report provides novel empirical evidence on the regional distribution of Higher Education Institutions (HEIs) in Europe based on data from the European Tertiary Education Register (ETER).

Expanding the geographical coverage of higher education is an important means to achieve two key objectives of the European Union Agenda for Higher Education (European Commission 2017). On the one hand, a broader geographical coverage lowers costs and barriers for student's access to higher education; this is expected to contribute to build 'more inclusive' higher education systems, since pupils from lower social classes are more penalized by the need to move to another region for tertiary education, which generates substantial costs for commuting and accommodation (Eurostudent 2019). On the other hand, higher education is an essential component of the formation of human capital, which is largely recognized as a major determinant of productivity and growth at the regional level (OECD, 2007; 2008; European Commission, 2011; 2016; 2017). Hence, establishing higher education institutions represents a major instrument for regional development and, therefore, to a more cohesive and balanced European development.

However, the geographical diffusion of higher education also entails the risk of generating additional costs by diluting scarce resources across a too wide range of institutions and localisations. For what concerns education, higher education institutions need to achieve a sufficient number of students that is larger than for (primary and secondary) schools and, therefore, cannot be spread too much across territories. This applies even to a large extent for research activities, which require a critical mass of resources and whose regional impact also depends on the adsorptive capacity of the regional economy.

While there is a large number of studies on the contribution of higher education research to regional development (for a recent review see Bonaccorsi et al., 2019), this reports focuses on the policies to enhance accessibility to higher education and, particularly, on the contribution to the regional coverage of higher education from non-university institutions and satellite campuses.

More specifically, we focus on two major themes.

First, we aim at providing a comprehensive analysis of the regional distribution of HEIs by looking, beyond the location of the main seat, to the distribution of activities in education (as observed through the number of students and their subject of study) and research (as measured by the number of PhD students and academic staff). In this respect, we exploit the rich availability of statistical data in ETER.

Second, we aim at analysing the temporal and institutional dynamics of the geographical structure of higher education, by combining data on the location with information on foundation years and types of HEIs and by looking, specifically, to the contribution of non-university HEIs and of satellite campuses to regional coverage.

It will be shown that the diffusion of HEIs across European regions is enhanced by the differentiation of the offering through non-university institutions, as well as by multicampus locations of universities. At the same time, we show that research-based locations remain more spatially concentrated in large cities.

This report has been prepared by Andrea Bonaccorsi (University of Pisa) and Benedetto Lepori (Università della Svizzera italiana) with the support of Daniel Wagner-Schuster and Marija Breitfuss-Loidl (JOANNEUM RESEARCH).

What is ETER?

The European Tertiary Education Register (ETER) is a database of European Higher Education Institutions (HEIs) delivering degrees at tertiary level. It provides data on descriptors and regulatory characteristics, geographical information, students and graduates, staff, HEI expenditures, research and transfer activities, as well as a set of pre-defined indicators characterizing relevant dimensions of HEI activities, like the extent of subject specialization, international mobility, gender balance.

ETER currently provides information on nearly 3,000 HEIs in 37 European countries from the year 2011 (academic year 2011/2012) to 2016 (2016/2017), including EU-28 countries, EEA-EFTA countries (Iceland, Liechtenstein, Norway and Switzerland) and candidate countries (Albania, North Macedonia, Montenegro, Serbia and Turkey). However, for some of these countries, no data (French part of Belgium, Montenegro, Romania) or very limited data (Albania, Denmark, Iceland, North Macedonia, Turkey) is available.

What is the rationale for ETER?

Reliable information on higher education systems is key for the modernization of European higher education, as it lays the groundwork for evidence-based policies. Reliable information at the institutional level is important for HEIs and stakeholders to make informed choices, for example on potential cooperation partners, subjects offered, the quality of education, employability, and research quality.

ETER contributes to these goals in two main ways. First, it provides a reference list of HEIs in the European higher education area, including descriptive and geographical information, which can be used to describe the system and allow matching ETER with other data sources. Second, it provides a core set of statistical data on these HEIs, which are sufficiently comparable between European countries.

Which is the coverage of ETER

In terms of HEI coverage, ETER provides a broad coverage of institutions in the tertiary sector delivering at least a diploma at the bachelor level (level 6 of the International Standard Classification of Educational degrees, ISCED[1]). ETER mainly excludes institutions delivering only short diplomas (ISCED 5). In terms of number of tertiary education students, coverage is above 85% for most European countries, as compared with EUROSTAT national data.

ETER HEIs can be divided in two groups: a) the institutions delivering degrees up to the doctoral level (ISCED 8), broadly labelled as 'universities' and b) the 'non-university HEIs' delivering degrees up to the bachelor (ISCED 6) or the master (ISCED 7) level. While universities are somewhat structurally similar across countries, in the sense that they pursue jointly education (up to the doctoral degree) and research, non-university institutions comprise very different types and groups of institutions, including colleges, artistic schools, educational schools etc.; non-university HEIs tend to be smaller, more specialised and, in most cases, with a limited or no research activity.

What are ETER's uses?

ETER is a general public resource, which can be accessed free of charge and combined with other sources. The potential uses therefore cover different scholarly and policy domains, like analysing the structure of European higher education, studying the impact of HEIs in regions and cities, analysing the efficiency of HEIs and the 'best' size to inform national consolidation policies. Most ETER data are freely accessible on-line at the public ETER website (www.eter-project.com). Part of the data is available upon registration and for research purposes only.

[1] https://ec.europa.eu/eurostat/statistics-explained/index.php/International_Standard_Classification_of_Education_(ISCED)

Who is leading ETER?

ETER is a project funded by the European Commission's Directorate General for Education Youth, Sport and Culture (contracts EAC-2013-0308 and EAC-2015-280) and the Joint Research Centre (contract 934533-2017 A08-CH). It is a joint undertaking of five partners - USI, Università della Svizzera Italiana, Lugano, JOANNEUM RESEARCH, POLICIES, Graz, NIFU – Nordic Institute for Studies in Innovation, Research and Education, Oslo, University of Rome La Sapienza and University of Pisa – in close collaboration with EUROSTAT, with a network of national experts and with the National Statistical Authorities of the participating countries.

How is ETER related to EUROSTAT educational statistics

ETER is a voluntary data collection promoted by the European Commission and is not part of the European Statistical Infrastructure. However, to a very large extent, ETER follows the UOE manual definitions and practices, particularly for students and graduates. Most data sources are the same as collected for EUROSTAT by National Statistical Authorities, which deliver them in disaggregated form to ETER.

The main difference with UOE data collection is that the reference unit is the higher education institution (HEIs) rather than a higher education system/country. Furthermore, ETER provides additional institutional-level data including HEI characteristics, financial and academic staff data obtained mostly from National Statistical Authorities.

2. The regional dimension of higher education: state of the art

As stated in the introduction, the regional dimension of higher education institutions is related to two broad policy issues, i.e. enhancing access to higher education on the one hand, contributing to regional development on the other hand.

2.1. Accessibility of higher education as a policy goal

Increasing the enrolment rate of young cohorts in higher education is a major policy goal in advanced societies, as it is largely agreed that the economic and social progress of countries and regions depends, in the long term, on the proportion of the population, which benefits from higher education in one of its various forms (European Commission, 2011; 2016; 2017).

Higher education, however, is not compulsory. Young people must make a decision, with significant economic and financial implications for themselves and their families. This decision has been largely studied in the last few decades. Among the determinants of the choice to attend higher education, the most significant role is played by the socio-economic background of the parents, as well as by ethnicity (Black, Devereux and Salvanes 2005). At the same time, empirical evidence suggests that costs associated with study mobility may be substantial. According to the last Eurostudent survey, on average, 36% of students living alone outside student accommodation faced housing expenses in excess of 40% of their income (Eurostudent, 2019).

Empirical findings concerning the impact of distance are somewhat mixed. Some studies find that increasing distance to the nearest HEI reduces access, even if the effect is less strong than other socio-economic factors (Sa et al. 2006; Cullinan and Flannery 2013), while other studies find no net effect (Gibbons and Vignoles 2009), possibly because of different geographical structures by country. Even if the overall effect is small, most studies show that the effect is stronger for students from lower social background (Cullinan and Flannery 2013). Moreover, distance influences the choice of the HEI in that low-income students are more likely to select the nearest HEIs irrespectively of quality (Gibbons and Vignoles 2009). Geographical distance, therefore, plays an important role in sorting students between HEIs depending on their social background.

While in the past studies focused on a single national context, ETER makes it now possible to analyse such questions at the European level.

In this context, the European Commission Directorate-General for Regional and Urban Policy recently published a report on the accessibility of universities for the European population (Poelman and Dijkstra, 2018). Based on ETER data combined with demographic and road network data, the authors showed that on average more than 80% of the European population live within a 45-minute drive of the main campus of at least one HEI. Nevertheless, in one out of five NUTS-3 regions, representing 14% of the EU plus EFTA population, the majority of the population cannot reach an HEI within 45 minutes (Poelman and Dijkstra, 2018). Accessibility is nearly universal for population living in cities, while it is lower in rural areas, particularly in the Northern and Eastern parts of Europe.

These results show that accessibility to higher education is a reality for most of the European population. In this report we will extend these findings in two directions: first, by analysing to which type of HEI students have access to, specifically by distinguishing between university and non-university HEIs; second, by analysing the additional contribution of satellite campuses to accessibility, which could not be taken into account in the previous study because of the lack of data.

2.2. The contribution of higher education to regional development

The regional development and higher education literature agrees that the presence of (one or more) HEIs within a region has a significantly positive effect on regional development. The literature on the topic is summarized in a recent report of the European Commission Joint Research Centre, which also provides novel empirical evidence by combining ETER data with data on firms' performance (Bonaccorsi et al., 2019).

The most important effect is generated by the creation of skilled human capital. Better educated workers are more productive, because they may undertake work activities with higher so-

phistication and complexity, hence larger economic value. Empirical studies confirmed a strong effect of human capital on labour productivity (Fischer et al. 2009) and, more generally, on the level and/or rate of growth of GDP at national and regional level (Glaeser and Saiz 2004; Rodriguez-Pose and Vilalta-Bufi 2005).

Second, university research contributes to regional economic performance by producing publicly available knowledge. Pathways include contract and cooperative research with companies, licensing of Intellectual Property Rights, students' entrepreneurships and the provision of advanced laboratories. The impact is strongly dependent on the discipline, with engineering and technology having the largest impact (Bonaccorsi et al., 2019).

Third, HEIs contribute to the economic well-being of their territories by allocating expenses for a variety of tasks, such as salaries for faculty and student expenses, as well as equipment and infrastructure. Studies support the notion that the direct economic impact is large and long term (Kott, 1987-88; Beeson and Montgomery, 1993; Blackwell et al., 2002).

Finally, there are also several other indirect and long term benefits, such as the spillover on the skills of non-graduated workers, the attraction of foreign investment, the creation of new firms, the collaboration with local industry and the like (for a review see Bonaccorsi et al., 2019). Another type of indirect impact is due to the association between HEIs and the cultural environment. Students and staff of HEIs are consumers and often producers of cultural goods, in the form of music, theatre, museum, entertainment and other amenities. While the causal relation between the presence of HEIs and the cultural environment is difficult to establish rigorously, there is little disagreement on the notion that HEIs contribute to culture at regional and urban level.

An important finding of this literature is, therefore, that the regional impact of higher education depends on the type and characteristics of HEIs and, specifically, on their involvement in research vs. education, respectively on the subject domain of activities. As we shall review in the next section, ETER provides in this respect a rich amount of data.

2.3. Regional structure and differentiation of the HEI system

The higher education literature has extensively analysed the differentiation processes of higher education systems; the lack of systematic information on HEI location made it however difficult to analyse how such processes unfolded geographically.

Overall, the literature provides strong arguments that HEI differentiation is beneficial to the society as it allows pursuing more efficiently different goals, such as achieving international excellence, economic innovation and access to higher education (Van Vught, Bartelse, Bohmert, et al 2008). At the same time, unlike the US with their strongly stratified system (Birnbaum 1983), it is generally believed that European higher education is characterised by strong isomorphic forces with HEIs imitating the 'university' model (Neave 1979).

In that respect, a basic distinction which emerged over time is between 'unitary' systems, in which the core of higher education is composed by (PhD-awarding) universities, and 'binary' systems where a second sector of higher education has been created, composed by HEIs focused on professional education (Universities of Applied Sciences - UAS; Kyvik and Lepori 2010). This subject is extensively analysed in the ETER analytical report n. 3, but is also relevant for this report since, in some countries, UAS have also been created to contribute to regional development outside the main cities (Jongbloed 2010).

Further, the literature on higher education diversity has identified two dimensions of differentiation relevant for this study (Daraio et al 2011; Huisman et al. 2015).

On the one hand, there are large differences between HEIs in the balance between research and education, between the two extremes of international research universities such as Cambridge and Oxford on the one hand, and of purely educational institutions on the other hand. Research universities are characterized by far higher budget than educational institutions and tend to be older (Lepori, Geuna and Mira 2019); accordingly, they are expected to be concentrated in more populated and richer regions. From a policy perspective, a strategy for extending regional coverage of higher education could, therefore, be the creation of education oriented

institutions, since costs per student will be lower than for research universities; at the same time, educational HEIs would provide only some of the benefits of higher education. Some countries, such as Switzerland and Finland, addressed this puzzle by attributing a regional mandate to UAS, with a focus on applied research and transfer (Jongbloed 2010).

On the other hand, HEIs differ by the range of the subjects they offer in education and research. Previous studies display a distinction between generalist HEIs, which constitute the core of European Higher Education, and a large number of specialised HEIs, focused on a single subject domain (Lepori, Baschung and Probst 2010). This has been confirmed on a larger sample through an analysis of the HEI profiles in ETER[2]. Among the specialised institutions, there is a large number of schools in arts, humanities and teacher education, as well as research-oriented technical universities. Governments might decide to establish HEIs in less central areas by focusing only on some domains and, particularly, by renouncing to domains which are particularly costly and have less students, such as engineering or medicine. This might however reduce some of the benefits of higher education for regional economic development, which tend to be larger for the technical sciences than for social sciences and humanities (Bonaccorsi et al., 2019).

Summing up, not only the presence or absence of an HEI in a region matters for regional development, but also the type of HEI, the subjects in which the HEI is active and the extent to which the HEI is engaged in research activities. As we will show in the following of the report, ETER provides suitable data to analyse these questions.

[2] ETER policy brief: What ETER tells us about subject specialization in European higher education (https://www.eter-project.com/uploads/assets/pdf/ETER_brief_subjectmix.pdf).

3. The ETER data: definitions and limitations

ETER contributes to fill the gap in structured information about the distribution of higher education activities across Europe. The database contains a set of variables concerning the geographical distribution of HEIs:

1. Information about the main seat of each HEI, including the region (by using the European regional classification NUTS-2016 at levels 2 and 3[3]), city and postcode, as well as geographical coordinates.
2. A dummy variable to distinguish multi-site institutions (i.e. institutions with satellite campuses in different NUTS 3 regions).
3. Information about the region (NUTS 3), city and postcode of the satellite campuses (if present).

Thanks to the first group of variables, it is possible to localise quantitative variables (finance, staff, education, research) at the regional or urban level. Information about multi-site institutions gives further information on the regional distribution of HEIs.

The geographical information in ETER was partially provided by National Statistical Authorities and partially collected by the project team from institutional websites and on-line sources such as Wikipedia.

For the purposes of analysis, we combine geographical information with the following ETER variables.

a) Information on the institutional type of HEIs. ETER provides a standardized classification, which builds on structural analyses of higher education (Kyvik 2004) and distinguishes between three categories:

- Universities, which display a largely academic orientation (without excluding some focus on applied research), have the right to award the doctorate and can bear the full name of "University".
- University of Applied Sciences. Commonly these institutions have a focus on professional education and, in most cases, do not have the right to award a doctorate (exceptions are possible). National names are for example Fachhochschule (Austria, Germany), Hogescholen (Netherlands), colleges (Norway), Ammattikorkeakoulu (Finland).
- Other. All institutions that do not fit into the two previous groups. This includes institutions like art academies, military schools, technological and professional schools in countries without a binary system (like the UK or France).

b) Information on legal status. Consistently with EUROSTAT methodology, the classification between public and private institutions is made according to whether a public agency or a private entity has ultimate control over the institution. Ultimate control is decided with reference to who has the power to determine the general policies and activities of the institution and to appoint the officers managing the school.

For the purposes of this report, we distinguish between public institutions, under the control of public authorities and private institutions, under the control of companies or independent boards[4].

c) Information on the HEI's foundation year, i.e. the year in which the institution was established in its current form. We notice that older HEIs might have a complex story of restructuring and mergers and, therefore, this variable might underestimate their age (an example are many French universities which were first split and then merged).

d) Statistical data on the number of students enrolled at the diploma, bachelor and master level (ISCED levels 5 to 7) and at the PhD level (ISCED level 8). While we will not use extensively this information in this report, the number of students (and of graduates) can be further broken down by educational fields, using the EUROSTAT Fields of Education and Training classification (FET-2013).

e) Statistical data on the number of academic

[3] https://ec.europa.eu/eurostat/web/nuts/background. NUTS 2 territorial units include population in the range 800.000-3.000.000 and correspond broadly to the administrative definition of "regions" (e.g. Regione, Land). NUTS 3 territorial units include population in the range 150.000-800.000 and follow the administrative definition of "province".

[4] A small intermediate group of HEIs is classified as private government-dependent: these are typically under the control of charities or foundations, but are mainly financed by the state and have similar regulations as public HEIs (for example KU Leuven in Belgium). In this report, these are included in public HEIs.

staff, defined as all staff with a contract with the HEI and which is engaged in education and/or research, such as professors, lecturers, researchers and PhD students employed for teaching assistance or research.

Data in ETER are available for the period 2011-2016. For our analysis, we use the most recent year, i.e. 2016, with the exception of France, for which we use data from 2014, and Denmark, for which we use data from 2013. Total number of HEIs in the dataset is 2,966.

Additionally, data on population and area of NUTS 3 regions have been retrieved from EUROSTAT and refer to the year 2016.

Data completeness and limitations

Completeness of data is 100% for geographical information (including satellite campuses) and above 90% for descriptive information, such as foundation year, HEI type and legal status. Availability is lower for quantitative variables: it is of 91% for total students ISCED 5-7, respectively 88% for students at ISCED 8 level, and of 58% for total academic staff. Student data are fully missing for the French part of Belgium, Iceland, Montenegro and Romania, staff data additionally for Albania, Estonia, France, Italy, Latvia, North Macedonia, and Turkey.

A major limitation of ETER data for the purposes of this report is that, while we have information on the location of satellite campuses, data on the number of students, PhD students and staff cannot be disaggregated by campus. This implies that, for the purposes of this report, all these figures are attributed to the main campus (and to the respective region).

4. Main findings

4.1. The regional presence of higher education: an overview

The most recent release of ETER confirms previous results that the regional presence of HEIs has become widespread across Europe. It also provides additional information on the contribution to regional coverage of satellite campuses (located in another NUTS 3 region than the main campus).

As a whole, 59% of the NUTS 3 regions in the ETER perimeter hosted in 2016 at least one main seat of an HEI; these regions comprised 79% of the European population and 75% of the European area (Table 1).

Satellite campuses added another 17% of the regions and 9% of the European population, leading to a share of nearly 90% of the European population living in a region with at least one HEI seat (main or satellite). Therefore, their contribution in terms of regional coverage is significant.

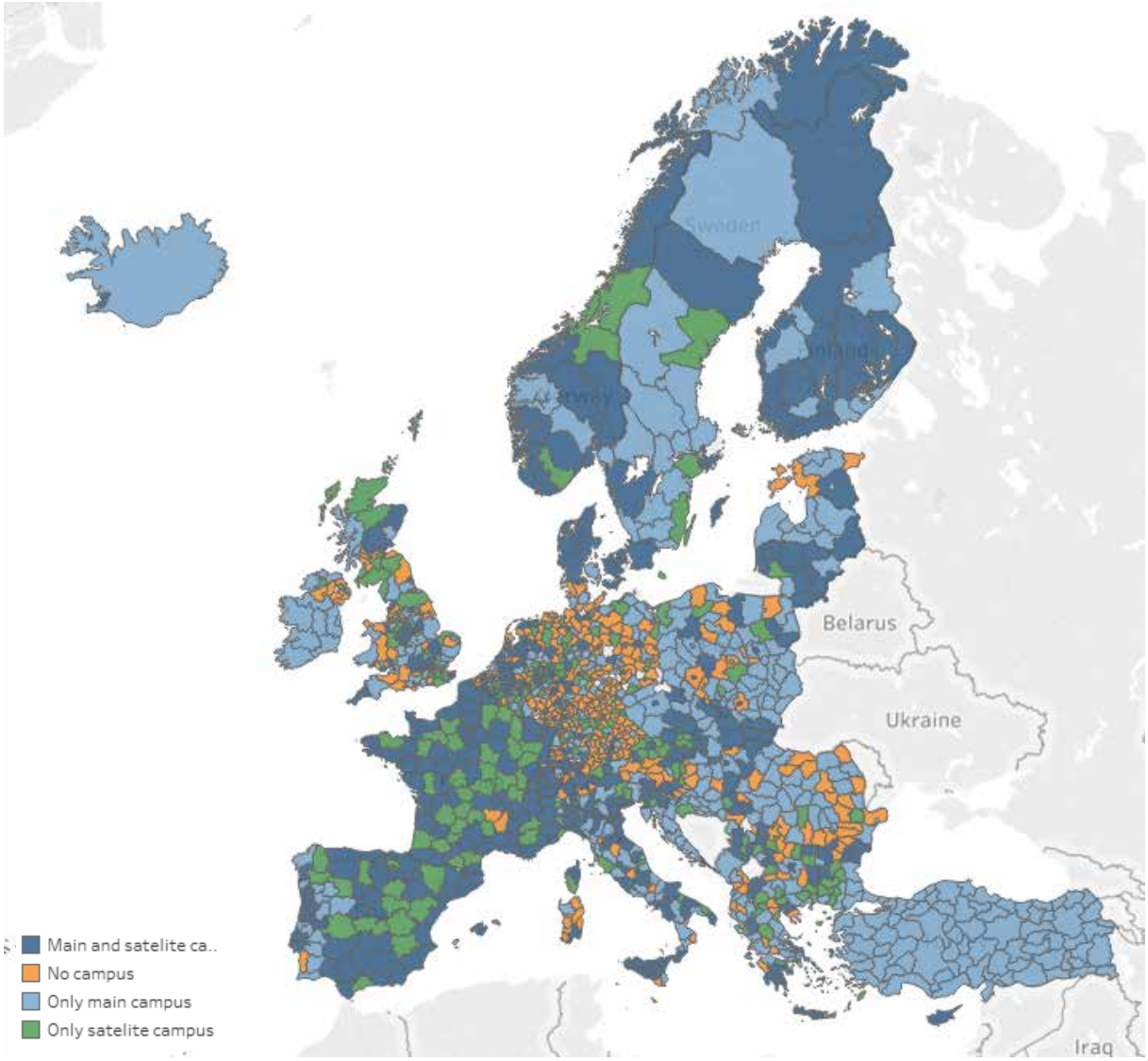
Table 1. Coverage of NUTS 3 regions by main and satellite campuses

	Number of regions	Population	Area (km²)
no HEI	378	71'717'237	656'239
Only satellite	255	58'052'349	778'583
Main seat	909	484'452'533	4'280'596
no HEI	25%	12%	11%
Only satellite	17%	9%	14%
Main seat	59%	79%	75%
Overall coverage	75%	88%	89%

Source: ETER (2019).

A map of Europe shows that the main regions without any HEI campus are in Eastern Europe and in Germany (Figure 1). The latter is however by and large an artefact of the very small size of NUTS 3 regions in that country; in many cases these are suburban regions that are very near to cities hosting an HEI and, therefore, the level of regional accessibility might be underestimated.

Figure 1. Map of European regions based on the presence of satellite campuses



The map shows also a large contribution of satellite campuses in some Northern and Eastern European countries, as well as in the UK, in France and in Spain. In the latter countries, this is mainly due to the presence in all regions of satellite seats of the Conservatoire National des Arts et Métiers (CNAM), respectively of the Spanish Distance University UNED, therefore displaying how the regional presence of a satellite campus does not necessarily provide the whole range of HEI services.

In terms of population covered, there are 4 countries, i.e. Austria, Belgium, Greece and Macedonia, in which more than 20% of the population lived in NUTS 3 regions hosting only a satellite campus. In additional five countries, i.e. Bulgaria, France, Spain, Slovenia and UK, the additional coverage of satellite campuses exceeds 20% of the country area (see Table 3 in the annex).

4.2. An in-depth analysis of satellite campuses

ETER data show how satellite campuses have become an important phenomenon in European higher education. In the year 2016, one out of every four HEIs in ETER had a satellite campus in another NUTS 3 region. The share is significantly higher for Universities of Applied Sciences (29%) than for universities (24%) and lowest for other institutions (16%), owing to their small size and specialized nature. It is also higher for public (24%) than for private HEIs (17%; see Table 2).

Table 2. HEIs with a satellite campus by type and legal status

	% multicampus
Public HEIs	24
Private HEIs	17
Other HEIs	16
Universities	24
Universities of applied sciences	29

Source: ETER (2019).

The share of universities with a satellite campus is largely variable across countries (see Table 4 in annex). In Scandinavian countries such as Norway, which is characterized by large country area, most universities have a satellite. The share of universities with a satellite is also significant in large countries such as France (60%), Italy (41%), Spain (39.0%) and United Kingdom (34%). An interesting exception is Germany, with only 12% of universities having a satellite campus. Among Eastern European countries, the share is very low in Poland (4%), Czech Republic (3%), Romania (2%) and null in Hungary.

Universities of Applied Sciences tend to have a higher share of satellite campuses than universities. This share exceeds 30% in Germany (31%), Austria (33%), Netherlands (38%), Denmark (45%), up to Belgium (59%) and Switzerland (75%). On the one hand, this reflects the regional mission of UAS; on the other hand, in many countries, UAS have been created through mergers of pre-existing professional schools that were located in different regions, such as in the case of Switzerland (Lepori 2008) and, therefore, inherited a distributed structure.

With respect to the legal status, it appears that, on average, 22% of public institutions have a satellite campus, against 16% for private institutions. A larger share is found in those countries in which the private sector has a traditionally strong presence in higher education, such as Spain, or Hungary and Bulgaria in Eastern Europe.

In terms of the number of campuses, most HEIs have just one or two satellite campuses, while only 47 HEIs have more than 5 satellite campuses. There are just 10 HEIs with more than 10 satellite campuses, the most extreme cases being CNAM in France (78) and UNED in Spain (47), as these institutions have a seat in all regions in their respective country, followed by the Private Fachhochschule für Ökonomie und Management Essen in Germany and by Centre des études supérieures industrielles in France. These HEIs are offering either distance education curricula or curricula parallel to work. Since lectures are delivered outside working hours or on weekends, there is a need of seats very near to the working place of students.

Summarizing, ETER data suggest three mechanisms explaining the existence of satellite campuses:

- First, in countries such as Italy, Spain and the UK, the creation of universities' satellite campuses allows increasing the regional coverage where the higher education system is dominated by universities, without having to create a university in every region.

- Second, in countries such as Germany, Netherlands and Switzerland, satellite campuses are a frequent feature of Universities of Applied Sciences, which maintained the distributed geographical structure of the parent schools.

- Third, distance education and professional education institutions, such as UNED or CNAM, have created local seats at regional level in order to deliver educational services to working students.

4.3. Which HEI in which region?

Using ETER data enables to analyze whether the geographical distribution is different by type of HEIs and, accordingly, also to identify the contribution of non-university institutions to the regional coverage of higher education. Since national systems are very different in their structure and, particularly, in the role of non-university institutions, it is important to

perform this analysis at the country level.

At the European level, universities are more widely distributed than UAS and other HEIs, owing to the fact that they are present in all countries. 618 out of 1542 regions host at least one university main seat, comprising 65% of the European population, as compared with 290 regions for UAS (18% of the population) and 424 regions for other HEIs (44% of the population). At the same time, there are 291 European regions, corresponding to 14% of the population, without a university, but hosting the main seat of a UAS or other HEIs. In other words, non-university institutions give a sizeable contribution to the regional coverage of higher education.

Figure 2. Share of population in region with different types of HEIs by country

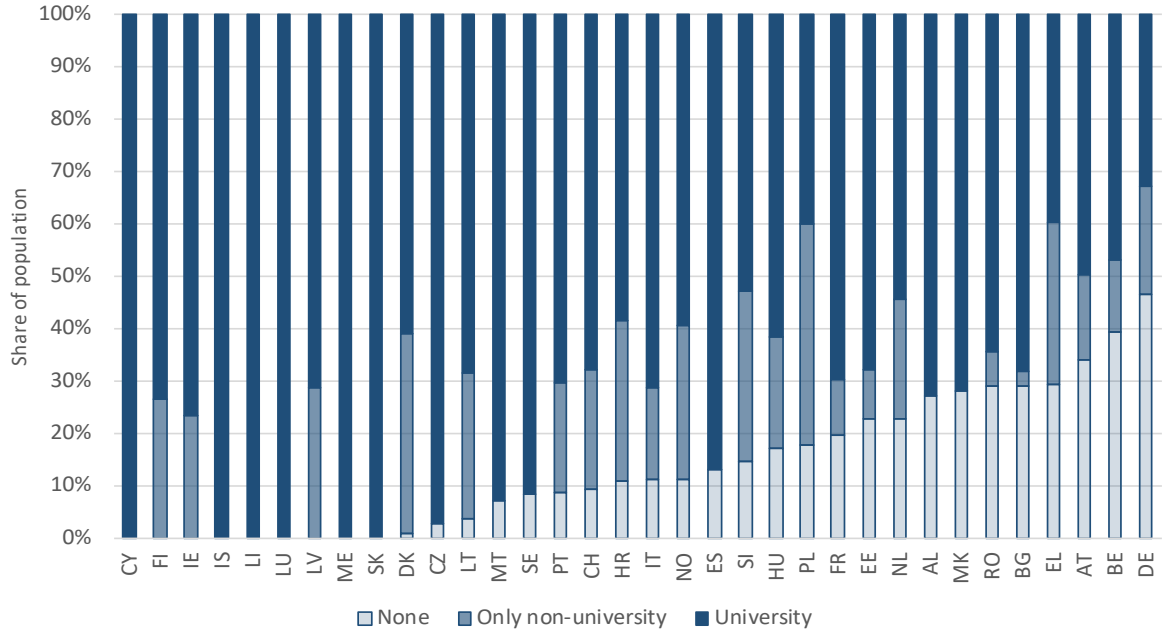


Figure 2 shows that in a number of countries, the non-university sector plays an important role in increasing the regional coverage of higher education. In these countries, the additional coverage of non-university institutions is in the range between 15-20% of the population (as it happens in Austria and the Flamish part of Belgium) and 30-40% of the population (in Denmark, Norway and Poland). On the contrary, in countries with unitary or university-dominated systems, such as Italy, Spain and UK, regional coverage is largely ensured through the establishment of regional universities, with a complementary role of other non-university institutions.

Yet there is another effect of non-university HEIs, i.e. increasing the density of higher education in those regions in which there already was a presence of HEIs. Increasing the number of institutions that operate in a territory improves the variety of supply of educational services, by discipline and orientation (academic or vocational). ETER data show that this effect is highly significant, as two-thirds of the UAS and 80% of the other institutions are located in NUTS 3 regions hosting at least a university. As shown by Table 5 in the annex, this is particularly significant in large metropolitan regions, with extreme cases being represented by Riga (29 non university and 3 universities), Berlin (25 and 9) and Lyon (21 and 3).

When looking at the number of institutions, it becomes clear that HEIs are strongly concentrated in a relatively small number of metropolitan regions (Figure 3). The top-50 regions by the number of HEIs host more than one-third of all institutions, while there are only 287 regions with more than 2 HEIs and 408 regions hosting just a single HEI. The top-regions by number of HEIs are the large capital cities, such as Paris, Istanbul, Warsaw, Lisbon and Berlin, followed by other large cities such as Porto, Barcelona or Milan (Table 5 in the annex). While we notice that this rank is sometimes affected by the de-

lineation of NUTS 3 regions (as in the case of London), the core message is clear. Many European regions now host an HEI, however in many regions students have little choice, while only in large metropolitan regions they have access to a differentiated offer in terms of quality, orientation and subjects taught.

4.4. The distribution of higher education activities

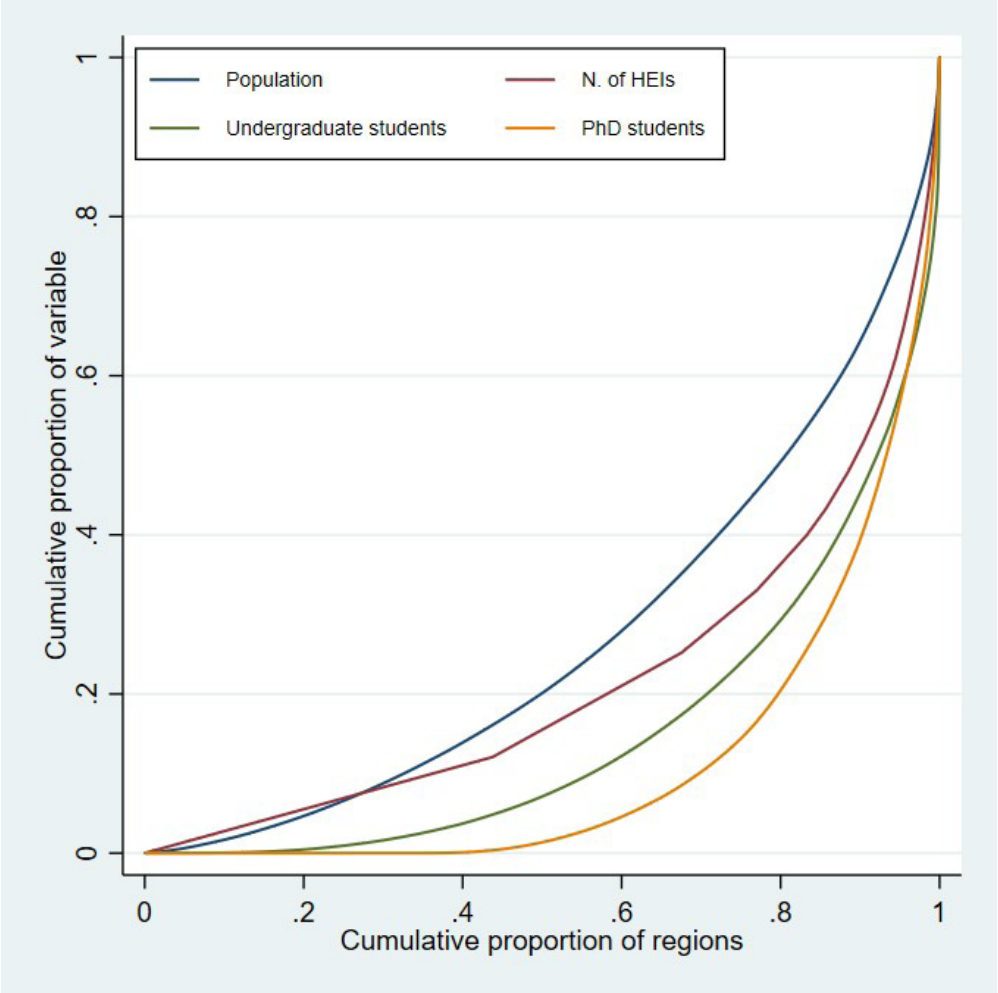
The analysis above has shown that universities have achieved a good level of regional diffusion in most European countries. Accessibility is also enhanced by multisite or satellite campuses of universities, as well as by the diffusion of non-university HEIs.

By combining information on location with ETER data, it becomes also possible to analyse the distribution of activities of HEIs at the regional level and, therefore, to disentangle the different functions HEIs play in the regional social and economic environment.

As shown by Figure 3, institutions and students are moderately more concentrated than the distribution of European population, showing how closely educational activities at the tertiary level follow the demographic structure of Europe.

In the future, ETER data will allow for more in-depth studies of the distribution of educational offerings, since data on enrolments and graduation are disaggregated by ISCED level and by fields of education. It could for example be investigated whether the educational offer in fields such as medicine or natural sciences is more concentrated than curricula in social sciences and humanities or whether the distribution of students differs by educational level (bachelor vs. master).

Figure 3. Distribution of the HEI activities by region NUTS 3



However, education is only one of the main HEI activities, the other being research.

While ETER does not directly provide data on research output, a suitable proxy for research activity (and its impact on regional development) is the distribution of PhD students (ISCED 8 level). On the one hand, it turns out that this distribution is highly correlated with publication output of universities (Lepori, Geuna and Mira 2018); on the other hand, PhD students represents a key component of human capital formation, as an important share of graduates at this level end up working in private R&D and technological development. However, career studies show that mobility of PhD graduates is higher than for undergraduate students and, therefore, their regional contribution will also be contingent to the absorptive capacity of the regional economy.

In that respect, ETER data confirm that PhD students are highly concentrated in a small number of cities and urban areas, both in absolute terms (10% of the regions hosting three-quarters of the PhD students) and relative to the population (see Figure 4).

Figure 4 shows that ISCED 8 students, as a proportion of the population (1,000 inhabitants) are concentrated in capital cities such as Madrid, Rome, Paris or London, or in urban areas. They are also found in smaller cities, such as Bologna, Leuven, Edinburgh or Utrecht, which have an ancient tradition of university activity and attract doctoral students from abroad, as well as in the Northern regions of Europe in general – partially explained by the low density of

population.

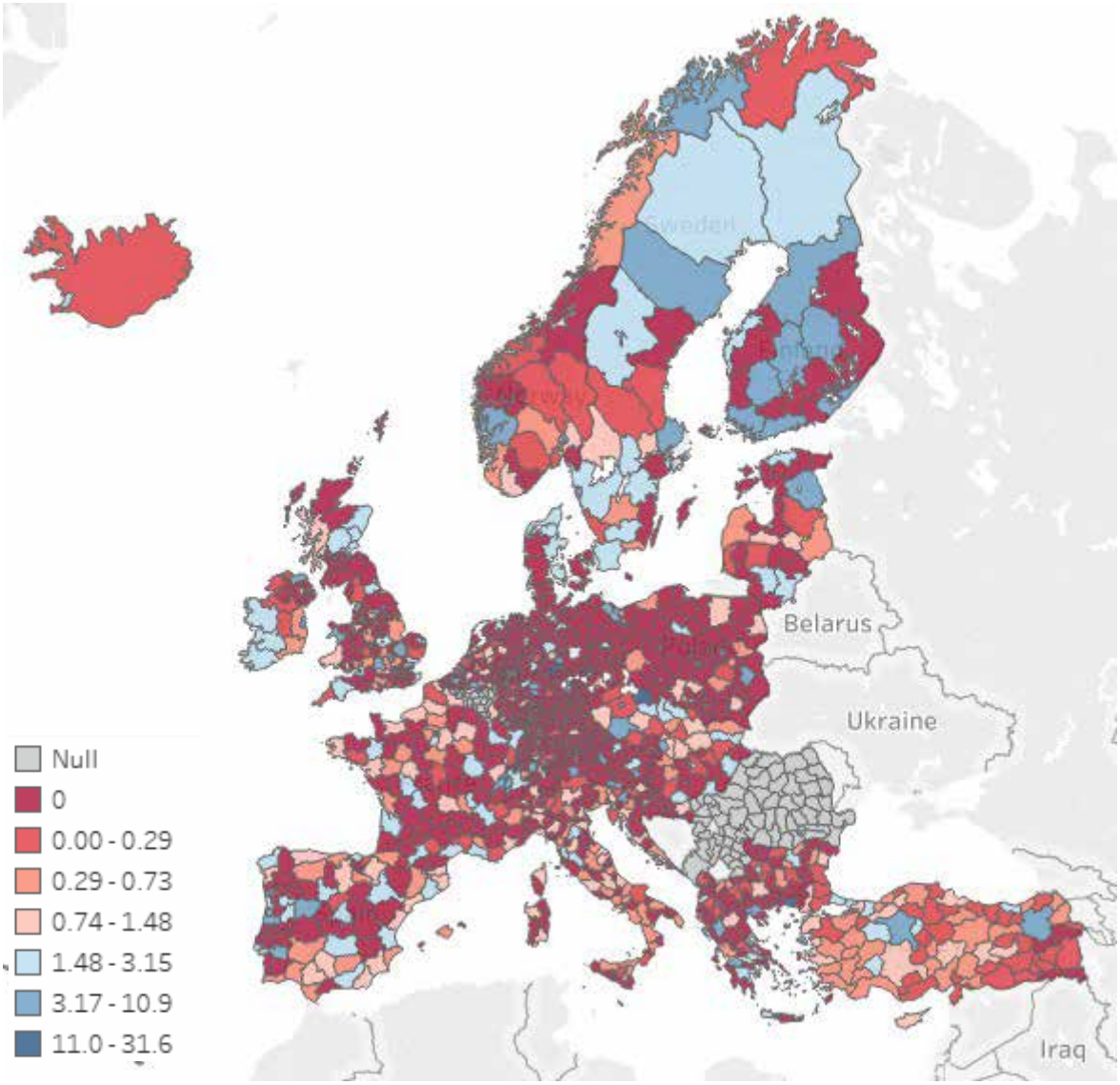


Figure 4. Number of ISCED 8 enrolled students per thousand inhabitants (NUTS 3)

No data for the French part of Belgium, Iceland, Montenegro and Romania.

Table 6 in the annex gives details on the regions with the largest number of PhD students; these regions comprise more than half of the PhD students in Europe and can therefore be considered as the core the research contribution of higher education. These include several capital cities of European countries (for example Paris, Madrid, Wien and Athens), as well as several large cities, such as Barcelona, Zurich, Valencia and Lyon. The list also includes some science-intensive medium-size cities such as Krakow, Oxford, Cambridge and Leuven. The geography of higher education research is therefore more concentrated spatially than the educational function and is heavily concentra-

ted in the Northern and Western parts of Europe.

Despite lower availability of data, which excludes from the list countries such as France and Italy (data available only in headcounts and therefore not comparable) and Turkey, similar remarks apply for the distribution of academic staff. The list of top-50 NUTS 3 regions by number of academic staff is very similar to the one of PhD students, displaying how the number of staff also follows the research mission of HEIs (Table 7 in the annex). Even if figures are somewhat impacted by the different definitions of NUTS regions, the density of academic staff in some of the core regions is highly impressive: in London City there are more than 4 FTEs of academic staff over 100 people and this share exceeds 1 out of 100 in Cambridge and Edinburgh. In such regions, academic work has become a core component of economic activity.

Summing up these findings, regional universities, non-university institutions and satellite campuses make higher education accessible to a larger population. However, these locations are smaller, in terms of staff, than headquarters of universities. Data from ETER show that, on the average, non-university HEIs have a smaller academic staff than universities (Lepori, 2018). Data on satellite campuses are not available in terms of staff, but the qualitative description of their activities show that they cover a limited range of curricula. In addition, some academic staff may shuttle from the headquarters. Summing up, the local presence of academic staff operating in non-university institutions and satellite campuses, as a proportion of the population, is inevitably lower.

Therefore, many peripheral regions have the benefit of accessibility for some curricula, but not the presence of a large academic staff and of research activity. This must be kept in mind in policy making, insofar as policies for accessibility should not place excess expectations on knowledge spillovers from research, while there is consensus for the economic contribution of investing in education at the tertiary level.

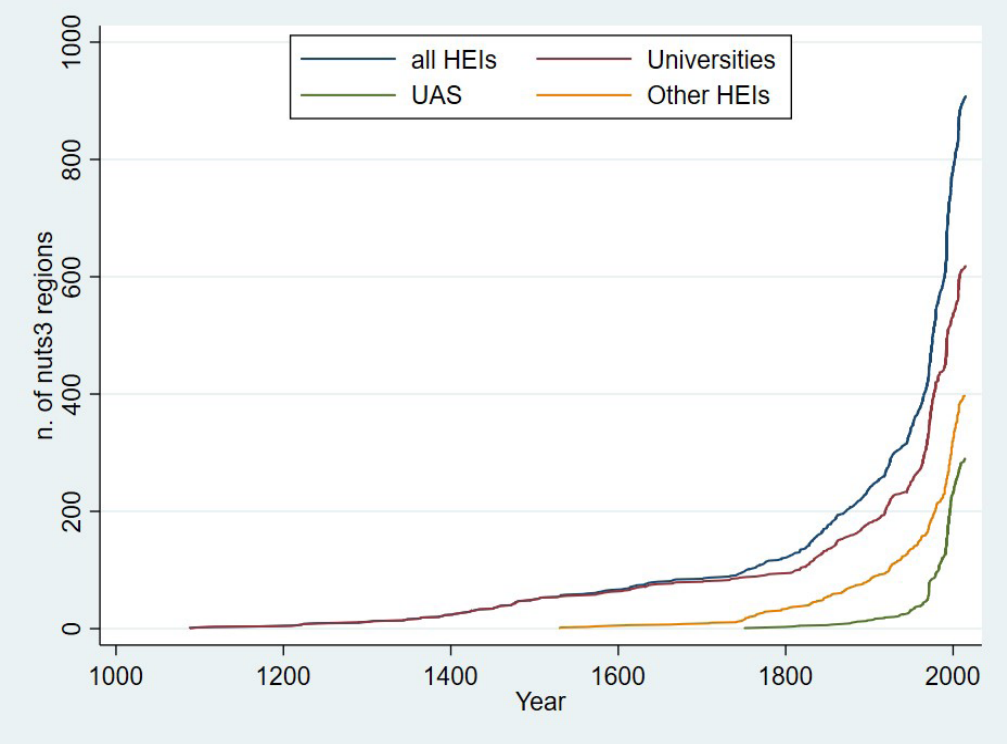
4.5. The temporal dynamics of higher education regional diffusion

ETER data finally allow investigating the temporal dynamics of regional diffusion since, for each HEI, ETER also records the foundation year. To some extent, this information might be biased by the fact that the currently existing HEIs have older ancestors, such as the Paris Sorbonne university, founded in 1971 with the split of the ancient University of Paris, which dates back to 1257. However, the overall pattern is clear.

As shown by Figure 5, until the beginning of the 19th century, higher education was highly concentrated in a few cities; these include capital cities, such as London, Paris and Rome, but also smaller cities, such as Oxford, Salamanca and Uppsala. Only 121 NUTS 3 regions host an HEI (in almost all cases a university) founded before the year 1800. The process started to accelerate in the 19th century with the intervention of the national state – the creation of the French élite Grand Écoles dating back to the Napoleonic period – and the foundation of the University of Berlin in 1810 by Alexander von Humboldt, considered as the prototype of the modern European university. The number of regions covered by higher education doubled to 241 in the year 1900.

This early phase was by and large dominated by universities; a few other HEIs were created already before 1800 (Collège de France: 1530), but this process started to accelerate in the 19th century. On the contrary, Universities of Applied Sciences did not significantly contribute to regional coverage of higher education until 1970.

Figure 5. Cumulative number of regions (NUTS 3) hosting at least one HEI in Europe by year of foundation and category



As shown by Figure 6, the process strongly accelerated after 1950, with the number of NUTS 3 regions hosting at least one HEI almost tripling from 1900 to 2016. At the start of the 20th century, there were universities in less than 15% of provinces. Universities of Applied Sciences were virtually unknown. Other HEIs were located in slightly more than 5% of the regions. At the turn of the century, universities were present in almost 40% of provinces, UAS in 20% and other non-university institutions in 25% of provinces. Spatial diffusion remained essentially a university phenomenon until 1970, but thereafter the contribution of Universities of Applied Sciences to spatial diffusion was important.

In one-third of all regions hosting an HEI, its creation took place after 1990, showing that the process even accelerated in the last 25 years covering more and more peripheral regions, but this was largely driven by non-university in-

stitutions.

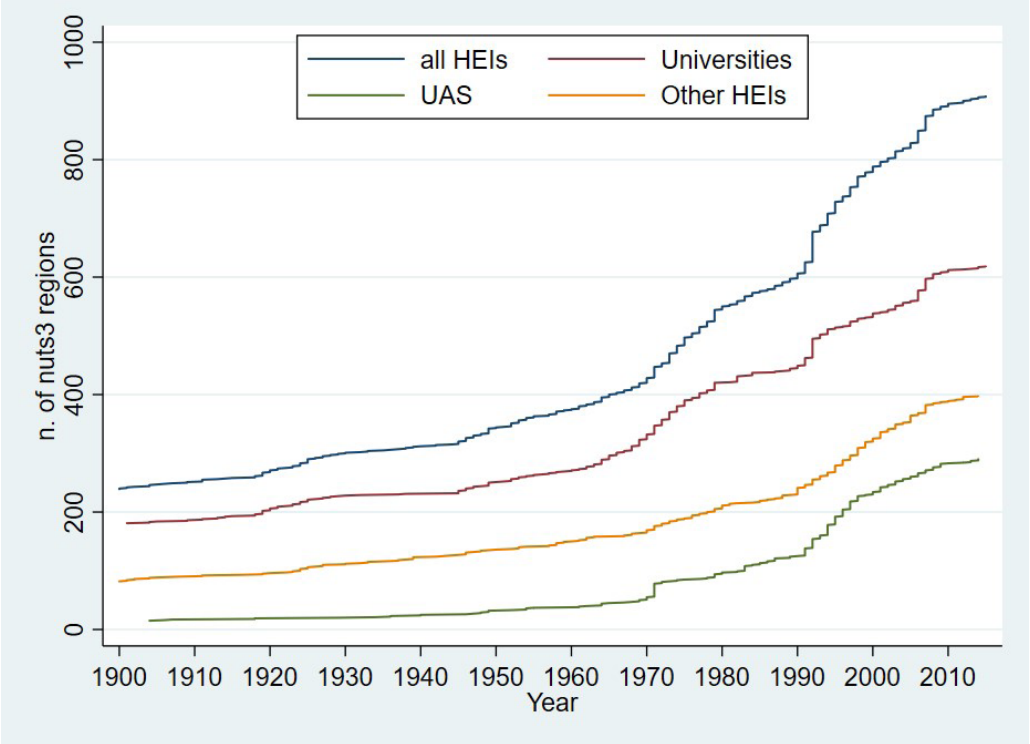


Figure 6. Cumulative number of NUTS 3 regions in which there is at least one HEI, by category. Year 1900-2016

Therefore, the process of spatial diffusion has a multistep dynamics driven by the saturation of specific categories of HEIs.

While the spatial diffusion of universities is a process that started at the beginning of 20th century, it takes momentum in the 1960s-1990s period. These are three decades of sustained growth of the cumulative number of universities. With the 1990s, however, the process slowed down. Opening new universities in provinces that were not covered before is becoming more difficult.

Starting from the 1990s, we witness an acceleration of the spatial diffusion of colleges and other non-university institutions, and above all of UAS. Their growth towards the current level is remarkable.

We do not have data about the date of creation of satellite campuses. Anecdotal knowledge based on manual inspection of websites suggests they are quite recent. We speculate their spatial diffusion process started in the 1990s as well. They might be part of the same process of multistep spatial diffusion that accelerated in the period in which it became too expensive (economically and politically) to create

brand new universities in new territories.

The whole process can be interpreted in terms of a trade-off between resources and regional coverage. On the one hand, creating HEIs close to students increases enrolment and completion rates, generating spillover from human capital. This is desirable from a public policy perspective. On the other hand, HEIs require the creation of a critical mass of resources, either in academic staff and in infrastructures, particularly for what concerns research activities. This creates a problem for public policy because resources would not be allocated efficiently if spread too thinly across regions.

This report shows how public policies mobilized different strategies to address this issue: first, the creation of regional universities outside the main cities, then the establishment (or consolidation) of Universities of Applied Sciences, as regional hubs for education and, increasingly, societal and economic outreach. Finally, the establishment of satellite campuses as a way to provide education at the regional level, while sharing human resources and infrastructures over the whole institution.

ETER data show how this process was highly successful in ensuring a remarkable level of accessibility of higher education at the regional level, while keeping resources and research activities concentrated in the metropolitan areas. As we highlighted, the major limitation of this strategy is that some of the peripheral regions only benefit of some of the advantages of higher education, specifically the creation of human capital, while remain largely excluded from research spillovers.

Whether the resulting spatial distribution across European regions is acceptable and how this process will furthered in the future is a matter for policy discussion.

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6. Annex tables

Table 3. Regional coverage of HEIs, main and satellite campuses, in percentages

Country	Main campuss			Satellite		
	Number	Population	Area	Number	Population	Area
AL	58%	73%		0%	0%	
AT	43%	66%	40%	29%	23%	32%
BE	34%	61%	42%	43%	30%	41%
BG	50%	71%	56%	25%	16%	24%
CH	69%	91%	90%	8%	7%	3%
CY	100%	100%	100%	0%	0%	0%
CZ	93%	97%	96%	0%	0%	0%
DE	40%	54%	32%	16%	15%	16%
DK	91%	99%	99%	9%	1%	1%
EE	60%	77%	66%	0%	0%	0%
EL	52%	71%	54%	35%	22%	31%
ES	63%	87%	66%	31%	12%	33%
FI	100%	100%	100%	0%	0%	0%
FR	59%	80%	51%	35%	16%	34%
HR	86%	89%	88%	5%	4%	8%
HU	70%	83%	74%	5%	4%	6%
IE	100%	100%	100%	0%	0%	0%
IS	100%	100%	100%	0%	0%	0%
IT	75%	89%	82%	12%	7%	7%
LI	100%	100%	100%	0%	0%	0%
LT	90%	96%	93%	10%	4%	7%
LU	100%	100%	100%	0%	0%	0%
LV	100%	100%	100%	0%	0%	0%
ME	100%	100%	100%	0%	0%	0%
MK	63%	72%	61%	25%	20%	30%
MT	50%	93%	78%	0%	0%	0%
NL	53%	77%	66%	13%	6%	7%
NO	82%	89%	91%	18%	11%	9%
PL	78%	82%	77%	7%	6%	8%
PT	88%	92%	90%	8%	8%	4%
RO	57%	71%	60%	2%	2%	3%
RS	60%			20%		
SE	81%	92%	90%	19%	8%	10%
SI	67%	85%	79%	33%	15%	21%

Country	Main campuss			Satellite		
	Number	Population	Area	Number	Population	Area
SK	100%	100%	100%	0%	0%	0%
TR	96%	99%	97%	0%	0%	0%
UK	49%	60%	50%	18%	12%	29%

Source: ETER (2019).

Table 4. Satellite campuses by country and type of HEIs

Country	Other		University		UAS		No category		Other	Uni-versity	UAS	No ca-te-gory
	No	Yes	No	Yes	No	Yes	No	Yes	% satellite			
AL	19		22						0%	0%		
AT	11	3	25	9	14	7			21%	26%	33%	
BE	15		5	7	14	20		1	0%	58%	59%	100%
BG	1		29	15	6	1			0%	34%	14%	
CH	12	3	10	2	2	6			20%	17%	75%	
CY	3		7	1	11	4			0%	13%	27%	
CZ	33	5	28	1					13%	3%		
DE	81	8	91	12	139	61			9%	12%	31%	
DK	1		6	4	12	10			0%	40%	45%	
EE			6	1	13	2				14%	13%	
ES			50	32						39%		
FI			10	5	20	6				33%	23%	
FR	340	144	59	90			112	6	30%	60%		5%
GR	11		16	6	6	8			0%	27%	57%	
HR		1	9	1	26				100%	10%	0%	
HU	22	6	25						21%	0%		
IE	4		7		14				0%	0%	0%	
IS			6	1						14%		
IT	114	5	57	40					4%	41%		
LI			1							0%		
LT			15	5	18	5				25%	22%	
LU			2							0%		
LV	19	2	6		17				10%	0%	0%	
ME	7		3						0%	0%		
MK			10	3			3			23%		0%
MT	1		1						0%	0%		
NL			12	7	23	14				37%	38%	
NO	7	4	2	6	14	4			36%	75%	22%	
PL	156	7	107	4					4%	4%		
PT	3	1	34	4	48	6			25%	11%	11%	
RO	30	1	53	1					3%	2%		
RS			9	7			30			44%		0%
SE	8		22	7					0%	24%		
SI			1	4	29	18				80%	38%	
SK	6		11	7	7	1			0%	39%	13%	

Country	Other		University		UAS		No category		Other	Uni-versity	UAS	No ca-te-gory
	No	Yes	No	Yes	No	Yes	No	Yes	% satellite			
TR	9		171						0%	0%		
UK	120	12	84	44					9%	34%		

Source: ETER (2019).

Table 5. Top-50 NUTS 3 regions by number of HEIs

nuts3	num	numuni	numuas	numother	population	HEIs per 100,000 inhabitants	% non-university
FR101	121	14	0	107	2,190,327	5.52	88%
TR100	56	50	0	6	14,657,434	0.38	11%
FRK26	48	6	0	42	1,835,903	2.61	88%
FRE11	42	10	0	32	2,603,723	1.61	76%
PL911	41	21	0	20	1,740,170	2.36	49%
PT170	39	16	19	4	2,812,678	1.39	59%
DE300	34	9	21	4	3,520,031	0.97	74%
FRH03	32	4	0	28	1,051,779	3.04	88%
RO321	32	15	0	17	1,843,962	1.74	53%
LV006	32	3	12	17	639,630	5.00	91%
AL022	31	15	0	16	842,981	3.68	52%
HU110	30	15	0	15	1,759,407	1.71	50%
CZ010	27	11	0	16	1,267,449	2.13	59%
FRJ23	26	6	0	20	1,348,183	1.93	77%
CY000	26	8	15	3	848,319	3.06	69%
PT11A	25	10	15	0	1,723,618	1.45	60%
BG411	23	19	3	1	1,319,804	1.74	17%
RS110	23	10	0	13			57%
ITI43	22	16	0	6	4,340,474	0.51	27%
UKI31	22	8	0	14	253,459	8.68	64%
BE100	21	3	10	8	1,201,285	1.75	86%
AT130	21	13	5	3	1,840,226	1.14	38%
PL415	20	8	0	12	541,152	3.70	60%
PL514	20	11	0	9	630,704	3.17	45%
FR107	20	2	0	18	1,378,151	1.45	90%
FRG01	20	2	0	18	1,380,852	1.45	90%
SI041	19	1	18	0	537,023	3.54	95%
DE600	19	6	9	4	1,787,408	1.06	68%
FRD22	19	4	0	15	1,255,755	1.51	79%
LT011	18	12	6	0	805,380	2.23	33%
FRI12	18	4	0	14	1,566,679	1.15	78%
PL633	18	8	0	10	741,521	2.43	56%
FR108	18	2	0	16	1,221,923	1.47	89%
FR104	18	4	0	14	1,287,330	1.40	78%
PL213	17	13	0	4	754,092	2.25	24%
ES300	17	17	0	0	6,424,275	0.26	0%
TR510	16	15	0	1	5,270,575	0.30	6%

nuts3	num	numuni	numuas	numother	population	HEIs per 100,000 inhabitants	% non-university
FRF11	16	2	0	14	1,121,407	1.43	88%
FR105	16	2	0	14	1,603,268	1.00	88%
FRJ13	16	4	0	12	1,132,481	1.41	75%
FRK24	16	5	0	11	1,252,912	1.28	69%
NO011	15	1	7	7	657,478	2.28	93%
HR041	14	3	11	0	801,349	1.75	79%
EE001	14	5	9	0	577,839	2.42	64%
FRH02	14	2	0	12	908,249	1.54	86%
DE212	14	3	6	5	1,450,381	0.97	79%
SE110	14	7	0	7	2,231,439	0.63	50%
FRK14	14	2	0	12	650,700	2.15	86%
FR103	14	2	0	12	1,431,808	0.98	86%
FRG02	14	2	0	12	810,934	1.73	86%

Source: ETER (2019).

Table 6. Top-50 regions by number of PhD students

nuts3	num	population	Total students ISCED 5-7	Total students ISCED 8	Total academic staff FTE	PhD students per 100,000 inhabitants
TR100	56	14,657,434	863,559	27,539	-	187.9
TR510	16	5,270,575	281,972	20,973	-	397.9
FR101	121	2,190,327	238,873	17,719	-	809.0
ES300	17	6,424,275	461,965	16,564	20,154	257.8
AT130	21	1,840,226	167,027	13,101	14,183	711.9
EL303	6	940,178	175,515	11,873	4,271	1,262.8
ES511	9	5,445,904	210,892	11,437	11,112	210.0
CZ010	27	1,267,449	119,133	11,427	9,447	901.6
DE300	34	3,520,031	161,382	10,726	10,552	304.7
CH040	5	1,466,424	60,882	9,270	13,485	632.2
PL911	41	1,740,170	260,763	8,723	15,203	501.3
PT170	39	2,812,678	128,119	8,598	10,484	305.7
UKI31	22	253,459	102,300	8,280	11,105	3,266.8
FI1B1	11	1,620,261	88,693	7,950	8,946	490.7
RS110	23		138,548	7,371	7,242	#DIV/0!
PL213	17	754,092	163,201	6,572	11,756	871.5
SE110	14	2,231,439	87,388	6,413	7,133	287.4
DE212	14	1,450,381	111,305	6,035	13,736	416.1
TR310	8	4,168,415	166,055	5,607	-	134.5
UKJ14	3	676,063	37,065	5,465	7,285	808.4
CZ031	10	637,834	63,024	5,366	4,454	841.3
ES523	6	2,518,678	95,463	5,361	6,643	212.8
UKH12	2	643,068	14,835	5,305	5,590	825.0
EL522	6	1,109,969	114,954	5,119	3,340	461.2
DE600	19	1,787,408	94,905	5,058	7,752	283.0
BE242	2	499,348	52,737	5,035	7,527	1,008.3
UKM82	6	611,807	82,385	4,925	5,800	805.0
ITI43	22	4,340,474	249,380	4,913	-	113.2
DEA2D	3	553,922	55,003	4,728	6,730	853.5
UKM75	5	502,983	57,605	4,550	6,150	904.6
IE061	9	1,331,306	83,773	4,450	5,702	334.3
DEA33	5	310,039	59,731	4,445	5,272	1,433.7
FRK26	48	1,835,903	111,634	4,392	-	239.2
UKI33	6	339,672	16,975	4,375	4,135	1,288.0
UKD33	6	535,562	70,325	4,345	6,645	811.3
CH011	3	773,407	22,475	4,271	6,293	552.2
BG411	23	1,319,804	104,525	4,025	8,644	305.0

nuts3	num	population	Total students ISCED 5-7	Total students ISCED 8	Total academic staff FTE	PhD students per 100,000 inhabitants
PL514	20	630,704	130,568	3,891	7,904	616.9
FRJ23	26	1,348,183	88,220	3,889	-	288.5
BE234	3	550,863	60,745	3,840	6,724	697.1
DEA22	2	318,809	33,550	3,806	3,957	1,193.8
DEA51	7	364,742	54,725	3,781	3,778	1,036.6
DEA23	8	1,060,582	89,890	3,775	6,670	355.9
DE91C	3	329,538	35,720	3,744	4,063	1,136.1
DK011	8	752,964	88,055	3,699	-	491.3
UKF14	3	321,827	58,330	3,655	4,810	1,135.7
HU110	30	1,759,407	139,310	3,641	8,535	206.9
NO011	15	657,478	89,008	3,612	6,477	549.4
FR104	18	1,287,330	45,212	3,561	-	276.6
FRK24	16	1,252,912	47,675	3,518	-	280.8

Source: ETER (2019).

Table 7. Top-50 regions by number of academic staff

nuts3	num	population	Total students ISCED 5-7	Total students ISCED 8	Total academic staff FTE	Academic staff per 100,000 inhabitants
ES300	17	6,424,275	461,965	16,564	20,154	314
PL911	41	1,740,170	260,763	8,723	15,203	874
AT130	21	1,840,226	167,027	13,101	14,183	771
DE212	14	1,450,381	111,305	6,035	13,736	947
CH040	5	1,466,424	60,882	9,270	13,485	920
PL213	17	754,092	163,201	6,572	11,756	1,559
ES511	9	5,445,904	210,892	11,437	11,112	204
UKI31	22	253,459	102,300	8,280	11,105	4,381
DE300	34	3,520,031	161,382	10,726	10,552	300
PT170	39	2,812,678	128,119	8,598	10,484	373
CZ010	27	1,267,449	119,133	11,427	9,447	745
FI1B1	11	1,620,261	88,693	7,950	8,946	552
BG411	23	1,319,804	104,525	4,025	8,644	655
HU110	30	1,759,407	139,310	3,641	8,535	485
PL415	20	541,152	130,940	2,910	8,285	1,531
PL514	20	630,704	130,568	3,891	7,904	1,253
DE600	19	1,787,408	94,905	5,058	7,752	434
BE242	2	499,348	52,737	5,035	7,527	1,507
UKJ14	3	676,063	37,065	5,465	7,285	1,078
RS110	23		138,548	7,371	7,242	
NL329	7	1,329,572	104,481	1,350	7,200	541
SE110	14	2,231,439	87,388	6,413	7,133	320
DEA2D	3	553,922	55,003	4,728	6,730	1,215
BE234	3	550,863	60,745	3,840	6,724	1,221
DEA23	8	1,060,582	89,890	3,775	6,670	629
UKD33	6	535,562	70,325	4,345	6,645	1,241
ES523	6	2,518,678	95,463	5,361	6,643	264
NO011	15	657,478	89,008	3,612	6,477	985
HR041	14	801,349	78,810	2,092	6,321	789
CH011	3	773,407	22,475	4,271	6,293	814
UKM75	5	502,983	57,605	4,550	6,150	1,223
UKI32	11	240,016	64,515	3,330	6,020	2,508
PL711	11	699,002	89,680	2,634	5,992	857
DE125	4	156,267	34,776	2,679	5,943	3,803
UKM82	6	611,807	82,385	4,925	5,800	948
IE061	9	1,331,306	83,773	4,450	5,702	428
PL814	9	708,274	70,401	2,988	5,660	799

nuts3	num	population	Total students ISCED 5-7	Total students ISCED 8	Total academic staff FTE	Academic staff per 100,000 inhabitants
UKH12	2	643,068	14,835	5,305	5,590	869
PL633	18	741,521	92,817	2,819	5,360	723
DEA33	5	310,039	59,731	4,445	5,272	1,700
UKG31	7	1,120,531	77,320	3,430	5,265	470
PT11A	25	1,723,618	63,699	3,472	5,218	303
AT221	8	429,088	47,913	3,137	5,148	1,200
NL310	6	1,273,613	75,816	956	5,086	399
DE131	7	226,393	32,228	1,312	4,903	2,166
DE252	1	108,336	37,496	1,182	4,870	4,495
DE111	9	623,738	50,549	2,084	4,821	773
SE232	5	1,648,682	67,205	3,203	4,820	292
UKF14	3	321,827	58,330	3,655	4,810	1,495
SK010	10	633,288	45,254	2,001	4,697	742

Source: ETER (2019).

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