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What ETER tells us about size distribution of Higher Education Institutions in Europe

Highlights

- **Almost half of the Higher Education Institutions (HEIs) in ETER are very small to small (≤2000 students); 42% are medium sized and only 12% are large to very large.**
- **The size distribution of HEIs displays large differences between European countries and is also linked to structural characteristics that exist in their higher education systems.**
- **Size is strongly correlated with the institutional profile in terms of institutional category, legal status and coverage of educational levels and fields.**

In this brief, the distribution of European higher education institutions by size of student population is analysed against their legal status, mission, subject focus and education vs. research orientation. This is a first of its kind report as it is only with the availability of data at the individual HEI level that such a fine-grained picture emerges. In this way, ETER represents a useful tool for scholarly and policy debates on the size of HEIs and its relationships with issues such as relevance, quality of education and research activities performed, efficiency and effectiveness of institutions.

The European higher education landscape, as described by ETER, is extremely diversified. Using student population (all levels ISCED 5-7) to define size classes (Daraio et al., 2011), 18% are very small institutions (≤500 students); 26% are small (>500 to ≤2000); and medium institutions have the highest incidence, representing 42% of total HEIs (>2000 to ≤20 000). Only 1 in 10 institutions are large with more than 20,000 enrolments and an additional 2% (40 universities) are very large with more than 50,000 students (Figure 1). In 2014, the largest university – Anadolu University in Turkey, which offers both traditional and distance education – enrolled more students than the total number of students enrolled in most other ETER countries.

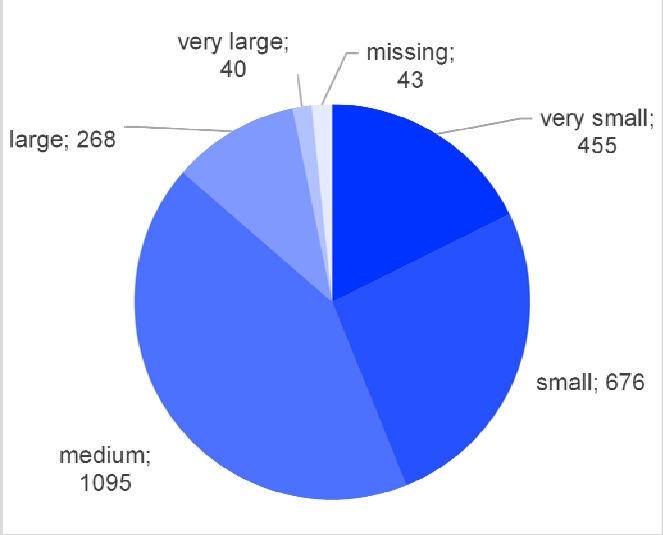

Figure 1. HEI distribution by size class (student enrolments)

N= 2577. Data for 2014.

Are European HEIs too small?

The figures described seem to suggest that European HEIs are small on average. This is of particular interest as university mergers are on the rise in Europe. A common assumption driving the mergers is that fewer larger institutions are associated with positive effects on cost and increases in visibility. Another factor is that consolidation may lead to an improved quality of teaching and research. Previous work however suggests that the optimal size of HEIs differs depending on their type and mission.

With the advent of ETER, these types of questions may be addressed as ETER presents the HEI as the unit of analysis upon which other data may be added and allows for comparisons of different institutional characteristics of similarly sized HEIs.

Size and institutional profiling

For the following analysis, size is defined in terms of student populations at first and second cycles of tertiary education (ISCED levels 5-7), as the level of data completeness is around 99% Figure 2 displays HEI size in relation to different institutional dimensions.

a) Type of institution (university, university of applied sciences, others). Universities are more than three times larger than an average institution in ETER (the median size is 10,074 against 2,704), while Universities of Applied Sciences (UAS) and even more so, other HEIs are smaller than the average (respectively 2,270 and 743 enrolled students).

b) Legal status (public vs private): private HEIs are much smaller compared to publicly funded (public and private government dependent).

c) Highest degree awarded (PhD vs non-PhD): PhD awarding institutions (not perfectly overlapping with the university category) are on average seven times larger than institutions awarding masters degrees (ISCED 7).

d) Subject mix (generalist, focused, specialised, see ETER brief on specialization): generalist institutions are the largest category on average, while specialized institutions are the smallest (the data's level of completeness by field is lower, but still around 90%).

An additional observation is that groups of HEIs are characterized by different levels of heterogeneity, (the height of the box). The groups of smallest institutions, i.e. non-university HEIs, private and specialised HEIs display less variation in size. On the contrary, the internal distribution of groups with larger institutions is more diversified, including both small and large HEIs (with the partial exception of the generalist group). Universities of Applied Sciences and focused HEIs are in an intermediate position: smaller on average but with a non-marginal number of medium and large HEIs.

Boxplots (Figures 2 and 3) are a way of representing the distribution of HEI values within groups. The upper and lower ends of the boxes represent 75% and 25% of HEIs, while the black line is the median (50% of the HEIs above the line). Stars and circles are extreme values and outliers, i.e. HEIs with a size much higher than the average. Taller boxes mean that HEIs in a group are more diverse.

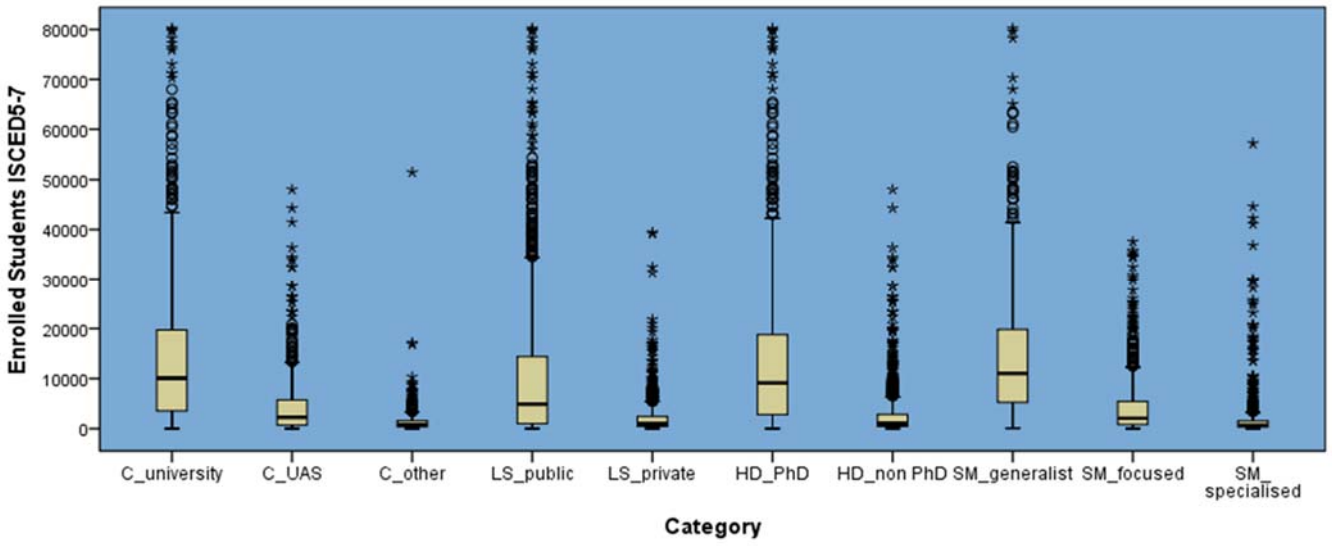

Figure 2. Distribution of HEI size in different categories of HEIs

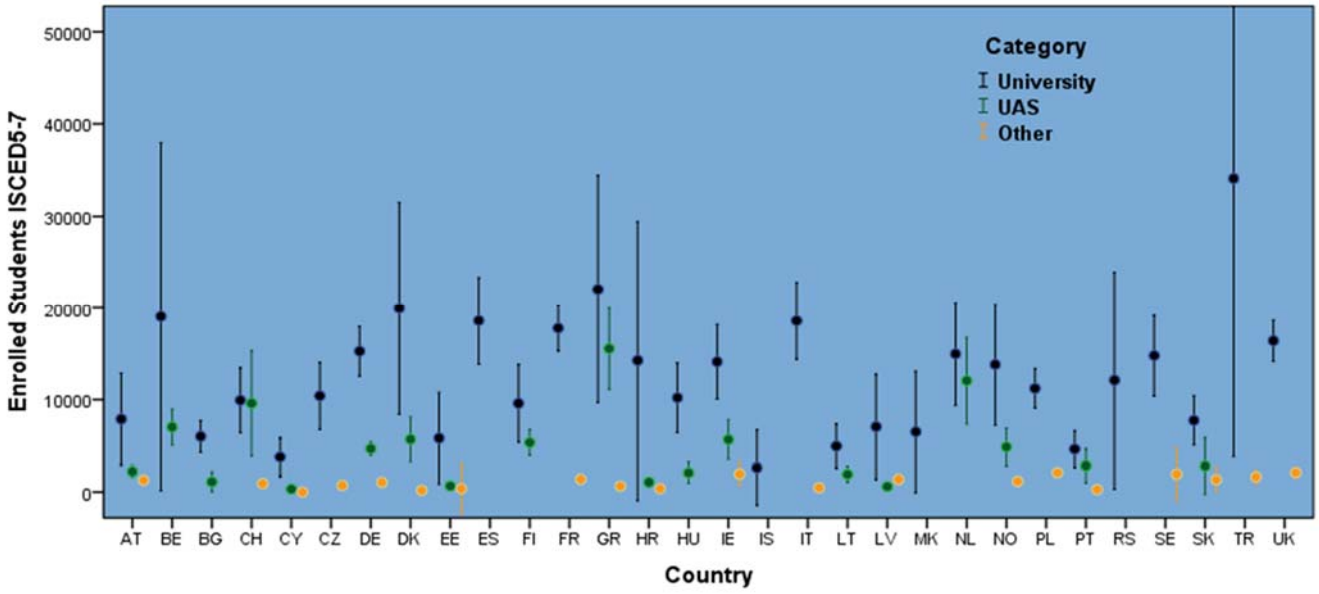

Figure 3. HEI size by country and type of institution

Dots are medians by each category, upper and lower ends of the bar correspond to 5% and 95% of the HEIs respectively.

Name	Country	Students ISCED5-7	Students ISCED8
Anadolu University	TR	2685232	1662
Istanbul University	TR	166514	6676
National University of Dist. Education	ES	158076	871
Ataturk University	TR	151947	3614
The Open University	UK	131910	445
National and Kapodistrian University of Athens	GR	109151	4327
Sapienza University of Rome	IT	108318	3298
University of Naples Federico II	IT	80224	1218
University of Belgrade	RS	79951	4060
University of Bologna	IT	79641	1481
Aristotle University of Thessaloniki	GR	78250	3963
Selcuk University	TR	77266	1961
University of Vienna	AT	76373	7623
Sakarya University	TR	75854	1686
Kocaeli University	TR	73056	633

Table 1. The largest universites in ETER (2014)

No one size fits all

A comparison across countries shows that the average HEI size is linked to country characteristics, including the demographic structure. HEIs in small countries and scarcely populated regions are usually smaller. The size of HEIs is also linked to the organization of the higher education landscape – where universities are the majority of HE institutions, the average size is larger than in countries with many colleges and other HEI categories.

In very small countries, HEI size is obviously determined by the size of the country. Otherwise, the differences in size between types of HEIs within the same country (for example, between universities and HEIs) tend to be larger than those between countries when considering the same type of HEIs (for example universities).

Figure 3 shows the average size (circle) by country and category of HEIs In all countries, universities are larger than UASs and other categories. In Switzerland, Netherlands and Greece, the difference in size between universities and UASs is smaller in terms of student population, as in these countries UASs cover a large share of student enrolments and went through a process of consolidation through mergers. We see also that comparing the average size by country can be misleading: Spain, where only universities are comprised, has the highest average HEI size among all countries (except Turkey) because of the composition effect. However, when comparing only universities, their size in Spain is smaller than in Denmark and Greece and fairly comparable with Italy and France, where a large number of small HEIs in other categories lowers the overall average.

This clearly demonstrates the need to compare similarly sized HEIs with similar structural features as is possible with ETER descriptors.

Measures of size in ETER. Potential use

ETER allows the determination of the size of HEIs using several variables of which student population is the most useful as it represents 99% data completeness as opposed to academic staff or total staff or the overall financial budget. The different variables could also be combined in order to build composite size indicators.

EUROSTAT aggregate statistics do not measure institution size, referring to the overall dimension of the HE system at the national or regional (NUTS2) level. Therefore, ETER represents a fundamental advancement in this respect.

First, microdata describe the complete distribution of HEIs within each country/region, allowing for a characterization of the size distribution in a proper way. This is important since the HEI size distribution within a country is characterized by a few large institutions and many small ones and, therefore, averages are not representative.

Second, the availability of different alternative variables that can be used as proxies for institutional size, thus allowing for a choice of the most suitable indicator for analysis in different policy fields.

In this brief, we focus on the student population as a proxy of size, aggregating students at diploma, bachelor and master level (excluding doctoral enrolments). An alternative measure of size is the number of staff, which measures the effort in education and research more precisely than enrolments. Previous work shows that, while staff and students are correlated, there might be large differences due to subject composition – more students by staff in social sciences and humanities than in natural, technical and medical fields. Completeness and comparability of staff measures by country and HEI is however somewhat lower than for student data.

Third, the availability of a full set of descriptors depicting the institutional profile of each HEI, allows for an analysis of different categories both within and across countries (as shown in this brief), exploring the heterogeneity of HE landscape.

ETER in a nutshell

The European Tertiary Education Register (ETER) database provides a core set of data on a subset of HEIs that issue degrees at the tertiary level. ETER is a project funded by the European Commission's Directorate-General of Education, Youth, Sport and Culture in close collaboration with EUROSTAT and the National Statistical Authorities in the participating countries. ETER provides information on more than 2,500 HEIs in EU-28 countries, plus EEA-EFTA countries and candidate countries. For a few countries (the French-speaking region of Belgium, Slovenia and Romania, Montenegro) only descriptive information is available.

ETER provides the following information on HEIs:

- Descriptors identify the HEIs and their official status, and provide information on foundation and history.
- Geographical information localizes HEIs by region, city and geographical coordinates, and provides information on whether there are campuses in other regions aside from the location of their main seat.
- Staff data categorizes HEI personnel by academic and non-academic; for academic staff, information is provided on gender, nationality, scientific field, and the number of full professors.
- Numbers of students and graduates broken down by educational level (diploma, bachelor, master), field, gender, nationality and mobility.
- Financial data includes total revenue and a breakdown between core and third party funding, as well as student fees and the composition of expenditures.
- R&D activities include the number of PhD students and graduates, as well as the volume of R&D expenditures.

ETER data can be downloaded from the project website (www.eter-project.com) and used for analytical purposes.

Key references

- **Daraio C. et al. (2011), The European University landscape: A micro characterization based on evidence from the Aquameth project, Research Policy, 40, 148–164.**
- **European Commission (2016), Education and Training 2020. Highlights from the Working Groups 2014-2015, Brussels.**
- **European Commission (2011), Supporting growth and jobs – an agenda for the modernisation of Europe's higher education systems, COM(2011)567.**
- **Ruocco G., Daraio C. (2013), An Empirical Approach to Compare the Performance of Heterogeneous Academic Fields, Scientometrics, 97, 601-625.**