Assessing the legitimacy of HEIs' contributions to society

The perspective of international rankings

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Abstract

Purpose – This paper aims to inquire about the types of measurements used by international university rankings and their connection to the higher education institutions' (HEIs) third mission activities, namely, the contribution to society.

Design/methodology/approach – The paper is based on a review of literature and content analysis of nine international rankings.

Findings – This empirical study corroborates that rankings focus on teaching and research activities but rarely measure the HEIs' connection to practice.

Originality/value – As the measurements used by international university rankings are claimed to have a huge impact on the structuring of the academic environment, this paper shows that international rankings fail to measure the HEIs' success in developing third mission activities.

Keywords Higher education institutions, Performance measurements, International rankings,
Third mission activities

Paper type Research paper

1. Introduction

Higher education institutions (HEIs) were developed as a response to specific societal requirements[1] of different cultures. Their purpose has been to train a given population in different fields and create the necessary workforce to conduct scientific investigations. For decades, HEIs have been considered to be an important source of knowledge and innovation, and they have been seen as having a significant influence on social and economic progress in various cultures (Jongbloed *et al.*, 2008).

Their traditional missions have expanded, shifting from primarily teaching to research, and eventually adding a third mission, labeled "contribution to society". Theoretically, all three of these missions have become equally important and distinctive on their own (Neave, 2000), but researchers claim that some of these goals matter more than others (ter Bogt and Scapens, 2012). This paper adds to the existing body of research by showing that the current indicators used by global international university rankings are in fact placing more emphasis on research and teaching, while HEIs' contribution to society is valued less.

The New Public Management (NPM) literature reveals mounting criticism leveled at HEIs and their newly developed strategies, claiming that the bulk of their attention is now focused on research activities and, as a result, they have distanced themselves from one of their initial purposes, namely, their ability to generate, use and exploit knowledge outside the academic

environment (Molas-Gallart and Castro-Martinez, 2007; Thomas *et al.*, 2013). Most of the current controversy has arisen from the fact that the current academic environment recently went through several major structural and functional changes (Youtie and Shapira, 2008), including, among others, a shifted focus to a broad range of market-oriented activities (Sánchez-Barrioluengo, 2013). Looking to attract students and their tuition, HEIs sought to improve their reputations through rankings, evaluation systems that mostly measured HEIs' research performance. As a result, many researchers started to question the role and purpose of different types of HEIs and stress their obligation to give something back to society (Thomas *et al.*, 2013).

Moreover, several national and international institutions have recently stressed the importance of HEIs in making a difference in business and society, a process they have defined as "impact" (e.g. AACSB, EFMD)[2]. In this paper, we address their call, and, as our predecessors have done, we call "third mission" or "third stream activities" the HEIs' actions intended to have a social, political or economic effect outside of pure research or teaching objectives.

Our research is timely and provides answers to current questions on the impact of HEIs on local, national and regional environments. The international university rankings[3] have become a mechanism that reflects the reality of higher education (Wedlin, 2006). They play an active role in defining the academic environment and the performance measurement of HEIs at a global level, and they also play a decisive role in forming a global market for higher education (Marginson, 2007). Although the use of these rankings has created many controversies (EUA, 2011; Bador and Lafouge, 2005), they are nonetheless used as a benchmark for the quality of higher education.

Consequently, we argue that in today's context of higher education without borders and the recently created global academic market, it is crucial to understand how HEIs' contributions to society are regarded by external evaluation systems such as international university rankings. In particular, this paper looks at the level of importance assigned to third stream activities by these specific evaluation mechanisms. We utilize content analysis of international rankings, an approach that permits us to perform detailed analyses on the categories of measurement used by external evaluations and to draw conclusions on what types of activities are considered to be legitimate. In this way, we are able to pinpoint the missions that are currently at the core of the future development of HEIs.

The remainder of this paper is organized as follows. In Section 2, we summarize the theoretical framework for analyzing HEIs' contributions and impact. In Section 3, we discuss the primary challenges posed by recent developments and performance measurements of third mission activities. In Section 4, we explain our methodology and define the research objectives of this study. In Section 5, we provide a review of the systems of third mission indicators reflected in most known international university rankings. Finally, in Section 6, we discuss the conclusions of the study and highlight its limits.

2. Theoretical framework
2.1 Performance measurement in higher education
This paper focuses on performance measurement systems (PMSs) and their use within the higher education sector. We therefore consider it necessary first to explain our take on the concept of *performance measurement*, the widespread adoption of PMSs and their evolution in the international context of higher education.

Neely *et al.* (2005) states that "literally [*performance measurement*] is the process of quantifying action" (p. 1228), further defining *measurement* as the process of quantification and *action* as the movement that leads to the desired performance. Bouckaert and Halligan

(2008), characterize the term *performance measurement* as the systematic collection of data obtained through the observation and the recording of performance-related issues. Halachmi and Bouckaert (1996) emphasize that *measurement systems* include practices, procedures, criteria and standards that govern the collection of data, data analysis and the compilation of results.

Starting from these basic definitions, PMSs can then be characterized as integrated systems able to collect and provide information for decision making. Their purpose is to help design achievable goals, encouraging interactions among members of the organization and motivating the employees (Esposito *et al.*, 2013). Along these lines, the consensus in the current literature is that PMSs are a pivotal tool in achieving efficiency and effectiveness, in supporting the evaluation processes and in enhancing accountability (van Dooren and van de Walle, 2008; van Helden *et al.*, 2012; Broadbent and Laughlin, 2009; Barrados and Blain, 2013).

Yet, PMSs are important not just in the business environment. In 1970, a new theoretical approach, NPM, emerged to assess and explain management issues observed in public institutions. Described as theoretical framework used to clarify how these types of institutions are managed and structured (Aucoin, 1995), NPM questioned the traditional belief that private institutions are exclusively profit-driven, while public institutions act only for the benefits of citizens.

In sectors like education and health, NPM proved that public and private entities are less different than they initially appeared to be. In the past few decades, public HEIs have been put under increased financial pressure and have had to overcome huge budget cuts (Higgins, 1989). As a result, they needed to make strategic changes to survive and compete effectively in the higher education market. Broadbent and Laughlin (2009) emphasize that the use of PMSs is particularly appropriate in the public HEI setting, as their results will help improve public efficiency and effectiveness, as well as refine the decision making of public administrators.

The NPM helped to change the institutional rules, ensuring that the public educational system is guided, controlled and motivated by market rules (Barzelay, 2001), and, above everything, they have positioned public institutions such that they are in a direct competition with the private HEIs. NPM was implemented in the public sector to bring the public management model in line with that of private businesses (De Boer and File, 2009).

Under this new management wave, an increasing number of public HEIs have adopted a PMS, motivated in part by government funding cuts to public higher education. In 1998, several public HEIs in the USA adopted a performance funding system and implemented the use of budgets (Alexander, 2000). At the same time, the Council of Australian Governments developed a framework for all public institutions with human services programs (education, health, housing, etc.), suggesting the employment of a program and a set of operational indicators intended to increase efficiency and effectiveness across a number of higher education activities. Another aim of the Council was to improve the transparency of the employed performance measurements, as well as the accountability of HEIs (McGuire, 2001, as reported in Van Thiel and Leeuw, 2002).

Through the Bologna process, similar changes were implemented in the European higher education sector. A total of 50 members have committed to the standardization of higher education degrees (Bologna Working Group on Qualifications Frameworks, 2005) with the aim of improving the competitive position of European HEIs in the global academic market (Mottis, 2008). PMSs were developed specifically to assess the strengths of European HEIs. According to the European Consortium for Accreditation (ECA), "[d]ata collection and

development of performance indicators should […] adhere to the principles of transparency, readability and accountability of European education" (ECA, 2009, p. 3).

However, the recent literature criticizes the practice of using a performance management approach in HEIs, citing the unintended consequences of assessing individual researchers' performance (ter Bogt and Scapens, 2012; Kallio *et al.*, 2016). In the UK, evidence shows that since the 1980s, the Jarratt Committee has focused its attention on the adoption of PMSs evaluating the performance of individual researchers (Jones, 1991). The politics of the UK's HEIs has shifted from the historical assignment of budgets and funds based on the overall institutional performance to government funding allocation based on research results (ter Bogt and Scapens, 2012). In The Netherlands, the government funding allocation formula has shifted in the past few decades to become dependent on research output (Sousa *et al.*, 2010; ter Bogt and Scapens, 2012).

The Nordic countries have tried for years to implement quality assessment programs that focus primarily on learning outcomes. Still, these evaluation systems are not fully functional. In Norway, the model is process-oriented and only considers indirect measures, while in Sweden, the program targets the assessment of students' learning outcomes (Pettersen, 2014). Finnish public institutions have approached a management-by-results method and, although they have been seriously criticized for it, they introduced a highly structured performance-related pay system (Kallio *et al.*, 2016).

In addition, scholars have criticized the current evaluation process of HEIs for reasons beyond those mentioned above. The Bologna process put a strong emphasis on students' learning outcomes (OECD, 2009) and the urgent push to focus on their needs created some negative effects in the behavior of private HEIs. A recent study has demonstrated that to satisfy the expectations of their students, some academic institutions oversimplified their course content and inflated the grades of those students who failed to pass the minimum course mark demanded by the Bologna process (Thomas *et al.*, 2013).

Researchers have discussed the various difficulties in adopting PMSs in public sector institutions, highlighting the need for the multidimensional perspective that was expected to tackle the complexity of this kind of entity (Broadbent and Laughlin, 2009; Ferreira and Otley, 2009). The unforeseen consequences of external evaluations and the riskiness of public sector performance measurement have also been covered at length (Van Thiel and Leeuw, 2002; Cuganesan *et al.*, 2014). The results of these studies have provided a valuable lesson for the HEIs that implement new PMSs. Among the highlighted downsides are the measurement errors, problems with adjusting content and workload (Bouckaert and Balk, 1991), the risk of symbolic behavior as a consequence of monitoring (Van Thiel and Leeuw, 2002) and even a possible distortion of performance information (van Dooren *et al.*, 2015). In this vein, Pollitt (2013) calls for researchers to pay attention to the logic used by different actors when approaching PMSs in public sector entities.

2.2 University rankings: an external performance measurement tool
There is a long history of competition among HEIs, and the introduction of NPM only fueled the proliferation of this phenomenon. For decades, HEIs were known for competing on reputation without any actual proof of their achievements (Shin and Toutkoushian, 2011). However, rankings recently came into play, providing an organized and integrated method for evaluating higher education performance (Locke, 2014). First published in the USA (Dill, 2006), rankings quickly spread worldwide due to media, private sector, professional association and government pressure. These university rankings were developed to:

[to allow] an entrant to higher education programmes, [evaluate] the phenomena of the international higher education market, [to introduce] market directions for [HEIs] at international and national levels, [and to enhance] sound and positive competitions for students, professors and the funders of [HEIs] (Lukman *et al.*, 2010, p. 619).

Despite the volume of criticism and commentary (Locke, 2014; EUA, 2011; Bador and Lafouge, 2005), university rankings have become a popular method for comparing higher education performance and productivity (Hazelkorn, 2013). In a relatively short amount of time, rankings created a reference point for positioning HEIs in the market (Hazelkorn, 2013). Due to their ability to provide simple "user friendly" information (Lukman *et al.,* 2010), rankings built a hierarchy of HEIs based on a set of criteria that measured their performance.

Aside from being regarded as assurance tools for higher education quality, rankings are also used by governments explicitly to define and disseminate institutional goals and strategies. "They drive performance improvement at a national level and are used for [governmental] resource allocation" (Hazelkorn, 2011, p. 163). Furthermore, rankings have made a significant impact on other stakeholders. Prospective academics use rankings to help them make decisions among job opportunities from different institutions (Locke, 2014), while employers select candidates based on the reputation of their institution of origin (Morley and Aynsley, 2007). As rankings largely reflect institutional reputation (Locke, 2014), companies look at them to decide which candidates are the most prepared to perform advertised job requirements. In sum, recent studies have universally shown that HEIs' strategy and management decision-making processes have been strongly affected by rankings (Locke *et al.*, 2008).

2.3 Legitimacy of rankings as performance measurement systems

Legitimacy is described as a process of justification: justification of activities, justification of actions or even justification of an organization's existence (Maurer, 1971; Pfeffer, 1981; Meyer and Rowan, 1991). An organization is regarded as legitimate only when it acts in accordance with socially accepted values, norms, rules and expectations (Sonpar *et al.*, 2010). Legitimacy arises from the shared belief that a certain institution or tool has the authority to set rules that must be followed (Mortimer *et al.*, 1976) and that individuals will comply with the organization's demands to be accepted by their social and professional peers (Parsons, 1958).

In this paper, legitimacy plays a central role. Given that external evaluation systems are viewed by the public as independent accountability mechanisms (Meyer and Rowan, 1977; Garvin and Bogotch, 1994), they have the power to influence individual and management decisions (Serrano-Velarde, 2014). Consequently, these tools are often used to legitimize the existence of different organizations, as well as their actions. The institutions that want to survive seek to align themselves with social standards and emphasize the development of activities that are socially and professionally acceptable (Sonpar *et al.*, 2010).

Furthermore, based on the assumption that individuals and institutions will develop "accepted and expected behavior" (Mitchell *et al.*, 1997, p. 866), legitimacy is considered synonymous with institutionalization (Suchman, 1995), a non-rationalized process that leads actors to endorse certain beliefs as taken-for-granted (Zucker, 1977; Sonpar *et al.*, 2010). Institutionalization is not universally viewed positively, and critics claim that the institutional approach pressures organizations into prioritizing certain values over others (Friedland and Alford, 1991). Researchers have recognized that dominant positions are gained during the initial period of market development, when institutions

struggle to legitimize their activities (Sonpar *et al.*, 2010). Thus, our research is timely because international university rankings have only recently been established as justified external evaluation tools with the power to legitimize their performance measurements. In such circumstances, it is important that we check the existence of third mission indicators and analyze their level of integration as key constituents in the evaluation of HEIs.

3. The higher education environment

3.1 The evolution of HEIs' missions

HEIs were developed as a response to social and economic needs, and, according to some authors, they cannot exist without achieving their commitments (Thorens, 1996). Traced back to Plato and Aristotle, HEIs were initially focused on training the elite members of the community (Roper and Hirth, 2005). The main role of academic institutions was to form specialists in different areas. Therefore, they focused on teaching and training as their sole function (Abbott, 1988). However, over time, their mission evolved (Youtie and Shapira, 2008). The events that changed the higher education system took place in the nineteenth century, when three spheres of influence existed: the German tradition, with the University of Berlin focused on teaching activities combined with scientific research; the British tradition, with Oxford and Cambridge directed toward individuals and their education; and the French tradition, which made the clear distinction between public and private institutions through the creation of *Grandes Écoles*, created with the clear aim of training the elite of the elite (Belhoste, 2001; Locke, 1985; Thorens, 1996; Thomas *et al.*, 2013).

The activities of worldwide HEIs were built upon one of the above-mentioned models. However, it was the German model that attracted American attention (Geuna, 1999). Largely because of funds provided by private donors, the American model became a competitive one, growing faster than any of its European predecessors. The USA invested heavily in innovation, and the huge number of published textbooks and case study materials quickly transformed these HEIs into benchmarks for academic institutions worldwide (Thomas *et al.*, 2013). Stressing the importance of scientific research and production of knowledge, the American HEIs became examples of best practices and modern models of academic expectations.

At this point, two missions existed: teaching and research. A third mission emerged a few years later. In the 1980s, the USA encouraged HEIs to help solve economic problems. The institutions were given the right to patent their innovations to earn money. A third mission was thus born. Although HEIs' contributions to social and economic development were new in name, this mission was not a revolutionary idea. As Laredo (2007) argues, the aim of academic institutions was always to prepare students for employment, a fact that represents a permanent contribution of HEIs to their environment. Yet, the new focus on creating partnerships with the business field was unique and answered new social needs while bringing HEIs the economic autonomy they desired (Roper and Hirth, 2005).

Although some studies argue that third stream activities do not exist as a distinct mission, we tend to agree with overwhelmingly large number of articles that claim the contrary. For example, de Rassenfosse and Williams (2015) emphasize that third stream activities should be redefined through the concept of "connectivity", which shows that all types of HEIs' activities are connected and the relationship between them is bi-directional. Yet, we conclude that at the present time, connectivity does not exist. We agree with de Rassenfosse and Williams (2015) that assessing a HEI's contribution to

society should take into consideration the institution's connection to societal development through its research and teaching, but we believe the separation of the third mission from the other two main missions makes sense at the present, as the prevailing perception exists that academic research defines the higher education environment. Moreover, academic research is generally defined only through the number of articles published and number of citations per article, not taking into account the social and economic utility of the research (Harley *et al.*, 2004; Djelic, 2008; Beyer *et al.*, 2010; Willmott, 2011; ter Bogt and Scapens, 2012; Gendron, 2015). As a result, we have built our study around the notion of "third mission activities".

3.2 HEIs' contributions to society

In our modern institutional society, actions cannot be evaluated without analyzing their connection to the social, economic and political environments. This "third mission" or "third stream" of HEIs (Laredo, 2007) includes all activities that generate, use, apply and/or exploit knowledge outside the academic environment (Molas-Gallart and Castro-Martinez, 2007). Contribution to society is a complex phenomenon and has at least three dimensions: free transfer of knowledge, innovation and entrepreneurship (Montesinos *et al.*, 2008). As stated by Laredo (2007), the third stream took the form of research, transfer of knowledge and innovation in the second part of the twentieth century. At that time, governments realized that collaboration between the industry and HEIs would allow companies to access the latest research results, as well as infrastructure and human resources. Moreover, from the point of view of HEIs, some third mission activities, namely, research and advisory contracts, represent a source of revenue and other non-financial benefits.

The current literature discusses the "triple helix" and "entrepreneurial universities" (Etzkowitz and Leydesdorff, 1997, *cited in* Molas-Gallart *et al.*, 2002), expressions that are actually defining third mission activities. The "triple helix" relationship refers to the interaction among industry, government and HEIs with the objective of creating "entrepreneurial universities" able to patent and commercialize innovations. In addition, contribution to society can also be seen as part of the HEIs' corporate responsibility, as they:

[…] should be able to meet the needs of regional and national economy, developing high level skills for work, play a more active role in job creation and the processes of welfare and prosperity of its context; concrete results to the region so it can be seen as a useful entity (Arraut Camargo, 2010, p. 5).

3.3 Performance indicators of the third mission

Due to the increasing interest in HEIs' interaction with the socioeconomic environment, the development of third mission indicators has picked up speed in the past few years. Consequently, research institutes (e.g. the Norwegian Institute for Studies in Innovation, Research and Education), as well as national and international bodies (e.g. OECD, EC), have included this topic on their agendas. Moreover, scholars have long claimed that national and regional policy practices and changes have influenced the construction of third mission activities (Brenneis, 2012). If we look at the European region, contribution to society has an important place among higher education activities. Analyzing the indicators provided by the European university rankings (e.g. the U-map classification[4]) and looking at the financing granted to projects (e.g. the E3M project[5]) with the primary objective of identifying the HEIs providing information about their third mission activities, we see that the relationship between HEIs and broader society is crucial to the European Commission's modernization agenda. This agenda aims to make Europe the most competitive and dynamic knowledge-based economy in the world, supporting the EU 2020 Strategy (European

Parliament, 2000): in a fast-changing world, education, research, innovation and creativity make a difference.

Because of the various ways in which HEIs and the economic environment can relate, the indicators that measure third mission performance are not easy to establish. Furthermore, the nature of HEIs' interaction with the socioeconomic environment is not well understood, so tools for quantifying the relationship are difficult to define (Berbegal Mirabent and Sole Parellada, 2012). Some indicators based on comparable data are available, but even if innovation indicators are a useful supplement, there are important aspects of the third mission that are covered by informal and indirect knowledge transfer. As a consequence, using only the direct HEI–industry comparison instruments might miss the target. This is why combined approaches are useful for capturing the fact that the third mission is very dependent on the context and the dynamics of the business sectors it serves (Slipersaeter, 2008).

Montesinos *et al.* (2008) emphasize that the innovation indicators can themselves comprise new services, products or processes that are transferred to society by HEIs' research groups. These indicators can represent the number of invention disclosures (Ken *et al.*, 2009), number of patents filed or other forms of intellectual property protection (Zhu *et al.*, 2010). This knowledge transfer generates income for HEIs and is closely related to the HEI's quality, as perceived by its stakeholders (Cohn *et al.*, 1989). However, this type of indicator should show up in HEI financials, which institutions are hesitant to release; as a result, these data are hard to collect. This is potentially one of the reasons why rankings are not taken especially seriously as metrics of third mission activities.

In the literature, interest in defining indicators of third mission activities has been demonstrated by authors and organizations from around the world. The studies we have cited have covered from a small (Sánchez-Barrioluengo, 2013; Laredo, 2007) to a larger number of indicators trying to cover all the possible interactions between HEIs and the social and economic environments in which they operate. One of the studies that analyzes the subject extensively is the Russell Report. This research aimed to establish a system of indicators for the third mission and as the authors state in their study, "the report provides an analytical framework and a comprehensive set of indicators that may assist in the tracking and management of university Third Stream activities" (p. iii). After looking at UK studies (sponsored by the Higher Education Funding Councils of England and the Centre for Urban and Regional Development Studies), American and Canadian studies (an annual evaluation of third stream activities is undertaken by the Association of University Technology Managers) and OECD and European Commission studies, the authors developed their own set of indicators for the third stream based on their own framework (Figure 1).
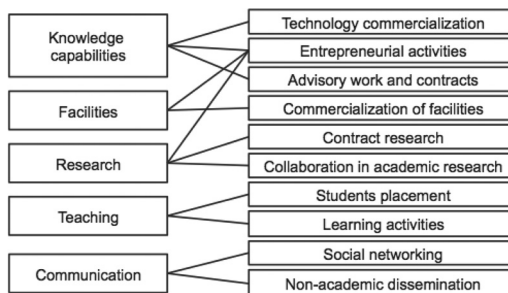

Figure 1.
Third mission-related activities

Source: Adapted from Molas-Gallart *et al.* (2002)

They grouped the third mission activities using two main criteria and then made sub-groups. The authors of the Russell Report looked at the main assets of HEIs: facilities and activities. By doing so, they covered a wide range of indicators that can measure possible interactions of HEIs with their social-economic environments. Therefore, for each activity that was defined in their conceptual framework as being part of the third mission of the HEIs, the authors of the Russell Report have proposed lists of indicators, which we are presenting in Table I.

Relatedly, during the INGENIO CSIC-UP workshop on November 10, 2008, Stig Slipersaeter (The Research Council of Norway, Director General's staff) made a comprehensive presentation – although not as extensive as the Russell Report – regarding third mission indicators. The proxies were grouped in user-directed commercialization, both user-directed and science-directed commercialization and science-directed commercialization (Table II). We can see from this classification that the interaction between HEIs and their socioeconomic environments materializes in higher revenues for the education institutions, which should be reflected in their financial statements, if these could be easily accessed.

Among the existing literature on third mission activities, these two studies have presented the largest number of indicators useful in measuring the third mission of HEIs. Indicators from other studies are subsets of those presented here.

4. Research methodology
In the previous sections, we discussed several concepts: rankings and their huge impact on academia, the development of a HEI's third core mission and how the current literature proposes measuring HEIs' contributions to society. Given the huge role rankings play in the academic environment (Locke, 2014; Locke *et al.*, 2008), we emphasize the importance of analyzing the ranking methodologies for the existence of an equal percentage of indicators on all three core missions of HEIs. To achieve this goal, we identified and divided all the indicators used and concluded that third mission activities are not among the ones evaluated, and thus legitimized.

Due to the complexity of the topic, we opted for a content analysis of the nine most known international and European rankings of 2014 that focus on the overall activities performed in HEIs:

- Academic ranking of world universities (www.shanghairanking.com);
- Times Higher Education World Universities Rankings (www.timeshighereducation.com);
- Performance rankings of scientific papers for world universities (http://nturanking.lis.ntu.edu.tw);
- World's Best Universities Ranking (www.topuniversities.com/qs-world-university-ranking);
- Leiden Ranking (www.leidenranking.com);
- CHE University Ranking (www.che-ranking.de);
- CHE Excellence Ranking (www.che-ranking.de);
- U-Map classification (www.u-map.eu/viewer.shtml); and
- Global Universities Ranking (www.globaluniversitiesranking.org).

Choosing content analysis as method of research was not incidental. Text analysis for describing context and purpose is a simple and effective approach with limitless potential in different streams of research (Brewer, 2003). This method permitted testing of our

	Exploitation and use of knowledge capabilities			Exploitation and use of university facilities	Research activities
Technology commercialization	Entrepreneurial activities	Advisory work and contracts	Commercialization of facilities	Contract research with non-academic clients
Number of applications and patents	Number of spin-offs	Number of consulting/advisory contracts	Revenue from facility rental	Contract research revenue
Number of licensed patents	Number of commercial arms (firms set up by universities to carry out contract research)	Number of business meetings and conferences attended	Number of visits from companies	Diversity of research interest
Number of licensees	Number of start-ups			Number of external research funders
Royalty income	The survival rates, number of employees and amount of income the university receives from spin-offs, commercial arms and start-ups			
Number of technology types (patented and licensed)	University support (business ideas, competitions, university development funds and loan facilities) to such companies			
Cost and frequency of litigation over infringement of intellectual property rights				
Funds committed to IP management				

(*continued*)

Table I.
Third mission indicators in the literature

| Flow of academic staff, scientists and technicians | Teaching activities | | Communication activities | Non-academic publications and media appearances |
	Student placement and other links with potential employees	Learning activities	Social networking	
Number of research staff with temporary employment in industry	Number of student placements	Number of trainings, teaching appointments and other activities directed toward non-academics	Number of participations in business and trade conferences	Number of non-academic publications
Number of industrial scientists with temporary employment in academic institutions				Citations of non-academic publications
Permanent moves in both directions as a result of previous collaboration between academia and industry				Participation in radio and TV programs

Source: Authors' projection from the Russell Report indicators, Molas-Gallart *et al.* (2002)

Table I.

Indicators of user-directed commercialization	Indicators of both user-directed and science-directed commercialization	Indicators of science-directed commercialization
1. Revenues from contract research for industry 2. Co-authorship academia–industry 3. Consulting and expert advice to industry 4. Grey literature or confidential reports to industry 5. Graduates' exchange with industry	1. Research results cited in patent applications 2. Publications in scientific fields of interest for business 3. Engagement in fields of science with a potential for commercialization 4. Mobility of personnel between research institutions and industry	1. Patents applied for by the institution or its academic personnel 2. Patents granted to institution or academic personnel 3. Revenues from licensing 4. The establishment of spin-offs owned by institution or academic personnel 5. Existence of a support organization for commercial activities 6. Existence of formalized rules for redistribution of revenues from commercialization of research results 7. Existence of courses in entrepreneurship

Source: Authors' projection based on Slipersaeter's presentation at INGENIO CSIC-UP

Table II.
Set of third mission indicators

hypothesis about the status of current international rankings and the attention they give to the third missions of HEIs.

To achieve our research objective, we started by classifying the type of international rankings selected for this study into two categories: classification and rankings, and European and global.

Classification (or *categorization*) is defined as the activity by which objects and ideas are recognized, differentiated, understood and grouped into categories (Cohen and Lefebvre, 2005). On the other hand, *ranking* is defined as an ordinal number approach, which specifies the position of an object on a certain scale (Mazurek, 2011). Based on these two definitions, we classified the nine international rankings given above into *classifications* or *rankings*. However, we defined the two CHE rankings selected for this study as *classifications*, even though they are called rankings. The CHE University Ranking and CHE Excellence Ranking are often given as examples of multidimensional rankings, including a number of indicators as performance measurements, which do not provide an overall indicator. As a result, they take the form of *classifications,* as defined above.

The next step was to check the internationalization of rankings and their scope. Rankings concerned only with European universities were defined as *European rankings*, while all other type of rankings were defined as *Global*. Analyzing the indicators used by these rankings, we concluded that some of them were specialized in research activities, so we created two sub-categories for the European and global rankings: *specialized* rankings concerned with one core mission of HEIs and *general* rankings including indicators on two or three core missions.

The last step was to use the Molas-Gallart *et al.* (2002) model for third mission indicator analysis. We went through the nine international ranking methodologies and selected the list of indicators used to measure the HEIs' contribution to their socioeconomic environments. The findings of this content analysis are further developed in the following section (Table III).

5. HEIs' third mission performance indicators reflected in international rankings

Some of the most recognized rankings have improved their methodology during the past few years by including systems of indicators related to academic contribution to society. From the ten associated activities presented in Table I, the following indicators are integrated into some of our selected rankings:

- contract research with non-academic clients;
- technology commercialization;
- student placement and other links with potential employees;
- learning activities
- entrepreneurial activities; and
- social networking (Table IV).

Technology commercialization represents the second high-interest category, with three international rankings (performance rankings of scientific papers for world universities, CHE University Ranking and U-map classification) included in their methodologies. Although Molas-Gallart *et al.* (2002) propose a set of indicators based on the number, revenue from and cost of technological products, the rankings prefer to collect data only on the number of certificates, patents and other inventions. The main concern over these associated third mission activities is the lack of indicators in three overall performance

Type	European		Global	
	General	Specialized	General	Specialized
Classification	U-Map CHE University Ranking*	CHE Excellence Ranking		
Ranking			Academic Ranking of World Universities (ARWU) Times Higher Education (THE) Leiden Ranking Global Universities Ranking (Reitor)**	World's Best Universities Ranking (USNRW) Performance rankings of scientific papers for world universities (PRSP/ HEEACT[a])

Notes: *Observation: this ranking includes only German HEIs or HEIs that teach at least one program in German; **Observation: this ranking covers European and Russian universities only; [a]HEEACT is the acronym for Higher Education and Accreditation Council of Taiwan, the institution that developed the performance rankings of scientific papers for world universities
Source: Authors' projection

Table III.
Selected international rankings

Ranking/associated third mission activities	Technology commercialization	Entrepreneurial activities	Advisory work and contracts	Commercialization of facilities	Contract research with non-academic clients
THE			Income per academic		Research income from industry per academic staff member
Reitor	Number of certificates on discoveries and patents				
CHE University Ranking	Inventions per FTE academic staff				Third-party research funds per academic staff member
CHE Excellence Ranking					Number of projects European Research Council grants
U-Map	Patent applications filed	Start-up firms			Income from knowledge exchanges activities Regional income sources
CHE University Ranking	Flow of academic staff, scientists and technicians	Student placement and other links with potential employees Support during practical placement phase Career orientation and practical relevance of courses Preparation for work life	Learning activities	Social networking	Non-academic publications and media appearances
CHE Excellence Ranking				Business conferences	
U-Map		Graduates working in the region	Part-time students Distance learning students	Cultural activities	

Source: Authors' projection

Table IV.
Third mission
indicators in
international rankings

university rankings (Academic Ranking of World Universities, Times Higher Education and World's Best Universities Ranking), especially as the first two claim to be rankings that highly scrutinize HEIs' academic and socioeconomic environments.

Only two rankings measure *student placement and other links with potential employees*. CHE University Ranking developed a set of three indicators focused on student placement, while the U-Map classification looks at graduates working in the region. For this specific category, Molas-Gallart *et al.* (2002) proposed only one indicator, namely, the *number of students placed*, but as shown by the U-Map and CHE University Rankings, there are some other indicators that can be successfully developed and integrated in this category.

Collecting data on the *learning activities* indicator proposed by Molas-Gallart *et al.* (2002) seems to be a difficult, but not impossible, task. The problem arises when HEIs must keep track of training, teaching and other activities directed at non-academics. In 2014, the U-Map classification was the only one to include this category. However, the indicators used by this European ranking replaced the amount of learning activities with the number of *part-time* and *distance learning students*. These students are closely connected to the socioeconomic environment, and are thus individuals with specific attitudes toward the working environment, HEIs and stakeholders of higher education. Consequently, the U-Map classification attempted to measure the emphasis put on the development of these educational programs by HEIs to capture their effect on the socioeconomic environment.

Molas-Gallart *et al.* (2002) developed a long list of indicators designed to measure the *entrepreneurial activities* of HEIs. Yet, only one indicator in the entire list was found in all nine selected international rankings. The number of *start-up firms* developed with the support of HEIs was included in the U-Map classification's methodology. This indicator is potentially of large value, as the revenue, survival rates and number of commercial arms, spin-off and start-up companies are not difficult to collect.

S*ocial networking* is another underdeveloped category. The CHE Excellence Ranking measures the number of *international conferences held or organized by departments*, without differentiating business conferences from academic conferences. As a result, this indicator might reflect both second and third university missions, and it was therefore integrated into the list of additional third mission indicators that can be further developed. Moreover, the only clear contribution to society measured by the selected international rankings is connected to *cultural activities*. The U-map classification looks at the number of exhibitions, concerts and performances organized by HEIs and accessible to the public. However, this indicator is a proxy for the fields of arts and architecture and does not have a generalized impact.

Intriguingly, the *advisory work and contracts* does not play a major role in international rankings. We did not find any indicator related to this category except the *income per academic* measured by the Times Higher Education. However, to be a valid indicator for third mission activities, the data on academics' income must be divided between teaching, research and third mission activities. As a result, the undifferentiated indicator was included in Table IV, along with other undeveloped additional third mission indicators integrated into international rankings.

The remaining three categories, namely, commercialization of facilities; flow of academic staff, scientists and technicians; and non-academic publications and media appearances, are completely ignored by international rankings. However, based on the discussion developed in the previous sections, we emphasize that without integrating indicators on these three

categories, the assessment of a HEI's contribution to society might only be halfway completed.

To conclude our content analysis, none of the analyzed rankings has a high focus on third mission activities. Some current methodologies (Academic Ranking of World Universities, World's Best Universities Ranking, Leiden Ranking and Performance rankings of scientific papers for world universities) do not pay attention to HEIs' contribution to society at all, while others (Times Higher Education and Global Universities Ranking) scarcely touch the subject. This is a huge concern, as we have previously emphasized the decisive role rankings play on behavior of HEIs, parents, students and society at large.

Interest from non-European overall university rankings in third mission indicators is low. The Academic Ranking of World Universities and Times Higher Education particularly are reasons for concern. Both have become very well respected and are leaders in performance measurement of higher education. Yet, neither of them paid much attention to HEIs' socioeconomic interconnections, despite the fact that worldwide interest in third mission activities has increased tremendously.

6. Conclusion and discussion

Governments, media and rankings have a strong impact on how HEIs behave. HEIs tend to change their decision-making processes to satisfy existing and potential customers. At the same time, the opinions of students and their families are based on the research tools currently used by rankings (Mcdowell and Sambell, 1999; Jongbloed et al., 2008; Logermann and Leišytė, 2015). Our article adds to this body of research by analyzing the performance measurement indicators used by international university rankings to determine what type of activities are encouraged in higher education and, as a result, what activities are legitimatized. Rankings assure governments, industry and society as a whole of the quality of higher education activities. They have gained power and are now displayed everywhere, from allocated spaces on HEIs' websites to huge posters displayed prominently on HEIs' campuses. Yet, as we have shown in this paper, many rankings put an emphasis on research performance, while only a few emphasize teaching or contributions of the institution to society. This fact becomes visible during the academic debate over the use of publications as a proxy for research, during international conferences in which plenary and track sessions are built around the topic of bad evaluations in higher education and even during informal meetings of professors who often discuss the pressure to publish in top journals. Some researchers go even further and point to the existence of an increased cynicism among academics, many of whom "play a game" of publication they do not believe in.

As this is a critical moment in the development of HEIs' third mission indicators (Piva and Rossi-Lamastra, 2013), it is of paramount importance that we draw attention to the fact that international ranking methodologies do not currently include institutional contributions to society as a meaningful mission of HEIs. Hence, we conclude that these evaluation tools do not externally incentivize HEIs to consider their contributions to their social and economic environments to be a main activity that they should perform.

Lacking an understanding that the current higher education system is at risk, focusing too much on top journal publication instead of cultivating long-term significant research problems and placing strict publication requirements on faculty that cause them to neglect

their teaching duties, HEIs' top management is pushing faculty members to become disconnected from their socioeconomic environments; instead of creating an increase in collegiality, the evaluation process has eventually led to an increasingly fractured environment, and the practices cannot be corrected and redirected toward the initial purpose of HEIs.

Our study was built on the third mission indicator proposal from Molas-Gallart *et al.* (2002), which allowed us to emphasize the small number of third mission measurements used by international rankings. Moreover, based on the model articulated in Molas-Gallart *et al.* (2002), we uncovered a set of additional third mission-associated indicators, which for the moment are underdeveloped in international ranking methodologies. Our results underscore the fact that third mission activities are not yet considered to be desired outcomes in the field of higher education. Specifically, we highlight that the best-known global university rankings lack the use of third mission measurements.

Among the existing indicators used by international rankings, we consider technology commercialization, entrepreneurial activities and contracts with non-academic clients to be the most important from an industry point of view, while student placement and learning activities are the most critical for students. We highlight the fact that most of these measurements are already required in the evaluation process of two international accreditation systems. A demand for transparency from the HEIs and the corroboration of AACSB and EQUIS could lead to the creation of a database with information regarding most of the associated third mission activities. We reiterate the idea that qualitative and quantitative methods of measurement are complementary and that they need to be used with caution. The information they provide is different and to interpret the performance of HEIs, both computable and descriptive data should be used. However, we do not debate that a change in the utilized measurements will lead to a change in the list of reputable worldwide institutions. Instead, this research aimed to draw attention to the fact that academics should be equally preoccupied by the different core activities of HEIs rather than neglecting one.

This paper paves the way for further research on the importance of third mission measurement and calls for more empirical investigation on the topic. One of the disadvantages of legitimacy-seeking is that the default behavior of institutions will lead to reduced cognitive process (Sonpar *et al.*, 2010). HEIs will no longer rationalize which activities they are able to perform or what they are best at, but will instead follow the herd and do what other institutions do, which in this case is push academics to publish as many articles as possible in top journals while paying only offhand attention to their pedagogical activities. Thus, a future research project could be developed to study the rationalization process that takes place in different HEIs, the development of their internal faculty evaluation process and the perceived legitimacy of each HEI mission.

Notes

1. Based on the cultural background of their home countries, HEIs can take the form of universities, polytechnic institutes, business schools, Grandes Écoles as well as other institutions with different specializations.

2. The Association to Advance Collegial Schools of Business (AACSB) published a new set of standards in 2013 in which they emphasize for the first time the impact of business schools. In 2014, the European Foundation for Management Development (EFMD) and the French Foundation for Management Education (FNEGE) launched the Business School Impact System, an evaluation framework that is meant to identify the tangible and intangible benefits that business schools bring to their local environments.

3. In this paper, we use the term "international university rankings" to refer to the external evaluation systems for HEIs. This, however, does not mean that the rankings exhaustively measure only the overall performance of universities. The term "university rankings" is used in the literature because they contain many different fields of study, a fact that makes them more likely to be among the top institutions in the world. The term is thus a catchall.

4. The U-Map classification is a project sponsored by the European Commission and led by the Centre for Higher Education Policy Studies (CHEPS). Started in 2005, U-Map aimed to classify European HEIs based on various criteria. Similar to the other two European rankings (the CHE University Ranking and the CHE Excellence Ranking), the U-Map classification neither computes overall scores nor provides league tables of HEIs performance. The absolute values of indicators are provided only when users select the HEIs they want to compare (www.u-map.eu/viewer.shtml).

5. The European Indicators and Rankings Methodology for University Third Mission (E3M) is a project initiated by the European Commission with the aim of generating a complete evaluation system that identifies, measures and compares third mission activities (www.e3mproject.eu).

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