

This is a pre-print of an article published in the Journal of Service Theory & Practice. The final authenticated version is available online at:

Berbegal-Mirabent, J.; Ribeiro Soriano, D.E. (2015). Behind league tables and ranking systems: A critical perspective of how university quality is measured. *Journal of Service Theory & Practice*, 25(3): 242-266. <https://doi.org/10.1108/JSTP-04-2013-0059>

Behind league tables and ranking systems: A critical perspective of how university quality is measured

Abstract

Purpose – This study focuses on university ranking systems and the popularity they have reached as instruments to stimulate the assessment of universities' quality. The inherent controversy of such evaluative procedures assists their diversification. In this paper we examine whether we are converging to more homogenous measurement approaches testing our hypothesis for the Spanish case.

Design/methodology/approach – A two-step approach is suggested. First, we qualitatively scrutinise the indicators used in four selected Spanish rankings. Second, we empirically test potential differences in the ways universities are ranked.

Findings – Results reveal that although the plurality and multiplicity of indicators there is a positive and significant relationship between the rankings analysed, evidencing some degree of convergence among Spanish university rankings.

Social implications – Because rankings do influence behaviour and shape institutional decision making, a better understanding of how these assessment tools are built is essential.

Originality/value – This paper provides a comprehensive survey of university rankings in Spain, offering a new perspective of the current state of the art of ranking systems in this particular country. Also a set of managerial implications for a better improvement of such benchmarking tools is presented.

Keywords – University quality, ranking systems, evaluation, higher education institutions, Spain

Paper type – Research paper

1. Introduction: The need for universities' accountability

Knowledge constitutes a potential source of competitive advantage across a wide range of industries and contexts (BarNir, 2012; Siegel and Renko, 2012; Welbourne et al., 2012), and as such, is of great value for any firm. In this context of a knowledge-based

society, the number of firms adopting the principles of open innovation has dramatically risen in the last years as a way to access new knowledge, reduce R&D costs and take advantage of third parties' expertise and technological means (Chaston and Scott, 2012; Sandulli et al., 2012).

In this particular framework, there is no doubt that higher education institutions (HEIs) offer a public service that contributes to the welfare of the society and its culture. Indeed, universities represent an inexorable source of knowledge, technological capacities and cutting-edge research developments, becoming the ideal partner for multiple stakeholders. Henceforth, there is a natural tendency of the business sector to outsource their research activities to universities (Lee et al., 2012a, 2012b), shortening the time span between discoveries and their application.

Firms that drive markets do so by shaping their business models, structures and mission according to current and future customers' requirements (Trimi and Berbegal-Mirabent, 2012; Zortea-Johnston et al., 2012). A similar restructuring wave has also impacted on the management of HEIs. As society demands more from HEIs (Hazelkorn, 2005), universities have enlarged their service portfolios and moved towards a redefinition process that requires the introduction of new formulae in their attempt to engage more efficiently into society's demands, make a better allocation of resources, and become more attractive for professors, researchers and students (Shattock, 2003; Van Vught, 2009).

But as any organization that part of its budget comes from public funding, transparency and accountability is needed. Yet, funding agencies want to be assured that funding is being spent in areas that are consistent with national efficiency and equity priorities, therefore, quality outcomes are important (Garlick and Langworthy, 2008).

As pointed by Ağca et al. (2012) in their study on manufacturing firms, a combination of internal and external elements to assess organizational performance and quality is essential. This statement particularly holds for universities, characterized by multiple functions and diverse stakeholders with perceptions and interests that far from converging, tend to follow opposite directions.

This translates into more stringent and detailed procedures to assess universities' quality. Clearly, higher education provides a unique setting in which to study service quality (Quinn et al., 2009). Since the 1980s universities are looking for new ways in which to inform their stakeholders about their performances (Mora and Vieira, 2009). Reports measuring universities' performance are available in abundance. In this sense,

league tables and ranking systems contribute to institutional quality and organizational effectiveness (Shin, 2011), while satisfy a public demand for transparency and information that institutions and governments have not been able to meet on their own.

Unfortunately, consensus concerning the best way to define and measure “university quality” does not yet exist (Brochado, 2009; Tang and Wu, 2010). According to Cheng and Tam (1997) “university quality” involves the input, process, and output of the educational system and encloses the services that satisfy both internal and external stakeholders by meeting their explicit and implicit expectations. This means that every stakeholder (e.g., students, parents, governments, accreditation agencies) has a particular view of quality which depends on their specific needs. A similar pattern as the one found in other business environments is observed (Garcés-Ayerbe et al., 2012).

“University quality” is a broad, dynamic and multi-dimensional concept that embraces different key roles (teaching, research and knowledge transfer), and innumerable facilities and services addressed to students, staff and the community (Harvey, 2002; Stephenson, 2004). Yet, it is closely related to the contextual setting, the institutional objectives and the specific standards within a given system, organization or discipline (Vlăsceanu et al., 2004). Consequently, ranking systems tend to differ extensively in the type and nature of the indicators selected (Enserink, 2007), and usually provide a partial measurement of the overall university quality (Neubauer, 2010). The inherent controversy of such evaluative procedures assists their diversification. Nevertheless, the fact is that university rankings are undoubtedly influencing the strategy of HEIs and there is a general belief that they are here to stay (Usher and Savino 2006; Hazelkorn, 2007; Hou, 2012).

Perhaps the reason why the assessment of universities’ quality has become such a meaningful topic amongst academics and policy makers is due to the never-ending expansion of the media and the rise of the evaluative state (Bonaccorsi and Daraio, 2005). Likewise, the massification, marketization and globalization of universities have also accelerated this debate (Dill, 2006; Shin and Harman, 2009). Accordingly, consensus has emerged on the need to investigate them as potential benchmarking tools (Marginson and van der Wende, 2007). So much so that countries from all over the world have shown, in one form or another, their interest in such methodologies developing complementary ways to assess the quality of their university system.

This is the case of Spain. According to Pulido (2009), in 1989 was held the seminar entitled “*Towards a classification of universities according to quality criteria*”, sponsored by the Spanish Secretariat of State for Universities and Research, which can be considered the starting point for raising awareness of university rankings in Spain. From this moment many initiatives have been carried out and many others are still in due course (Pérez-Esparrells and López-García, 2009).

At this point, some questions arise: How different is one ranking from another? Are we converging to more homogenous measurement approaches? In this paper, we attempt to respond to these unsolved questions by empirically comparing four different rankings that are specifically designed to evaluate the Spanish higher education system. As we concentrate on the particularities of the Spanish context, it is expected that differences in the indicators used and positions reached by universities in these league tables tend to diminish compared to the diversity found in international rankings.

The remaining of the paper is organised as follows. Section 2 presents the theoretical background. Section 3 provides an overview of the Spanish framework in university rankings. Section 4 describes the methodological approach and compares the selected rankings. Conclusions and policy implications are discussed in Section 5.

2. League tables and ranking systems

2.1. Origin

Standardization is becoming the norm for the higher education system (Díaz-Méndez and Gummesson, 2011), representing the ultimate consequence arising from the discourses around efficiency and effectiveness that have infused today’s quality service consciousness among university’s stakeholders (Ntshoe et al., 2010; Hou, 2012). In this regard, there is a growing interest for quantifying quality parameters and make them comparable.

League tables and ranking systems are aimed at playing this role by objectively assessing the quality of universities. Although these procedures have encouraged a parallel debate about their appropriateness and legitimacy (Salmi and Saroyan, 2007), they have become a natural barometer of global competition.

The practice of rankings started in 1925 when Professor Donald Hughes classified graduate programs in the US on the basis of peer reputations (Shin and Toutkoushian, 2011), nevertheless the ranking phenomenon didn’t expand until the 1980s, with the

growth of the higher education market and the increase in the number of students seeking for higher education (Hou et al., 2012).

In 1983, the US News and World Report published the first national ranking in the US and gradually expanded its focus. Since then a growing number of researchers, academic institutions, independent agencies and media organisations began to rank universities and academic programs, spawning the development and publication of national and international rankings (Shin and Toutkoushian, 2011).

Some of the most well-known ranking schemes include the *Academics Ranking of World Universities (ARWU)* developed by the Shanghai Jiao Tong University, the *Times Higher Education Supplement-QS World University ranking*, the *U-Multirank* funded by the European Commission, the *CHE Excellence Ranking* published by the Center for Higher Education Development in Germany, the *SCImago Institutions Rankings (SIR)* or the *Leiden ranking* developed by the Centre for Science and Technology Studies (CWTS) of the Leiden University.

Also, research on ranking systems is widely documented in the literature and different approaches are envisioned. For instance, Salmi and Saroyan (2007) and Usher and Savino (2007) provide a comprehensive overview of worldwide and national university rankings. Other authors focused their research efforts on comparing world university rankings (e.g. Dill and Soo, 2005; Buela et al., 2007; Marginson and van der Wende, 2007; Aguillo et al., 2010), and some other do it analyzing rankings by countries (e.g. Eccles, 2002; Federkeil, 2002; Siwinski 2002; Yonezawa et al., 2002)

2.2. Building a ranking system

Technical and methodological difficulties are found when trying to build a ranking. Indeed, there is much criticism about ranking methodologies. For instance, Van Dyke (2005) and Marginson (2007) argue that league tables conceal a whole array of anomalies and methodological problems, ranging from what is meant by “university quality” to the arbitrary selection of indicators and their weightings.

There are also widespread concerns about the bias of the measures in favour of English language nations and the use of Nobel indicators (Marginson, 2007). Other pitfalls include the limited and unreliable data sources (generally reinterpreted from government and other public databases or from bespoke surveys on research productivity and teaching/learning) (Hazelkorn, 2009), the simplistic presentation (Neubauer, 2010) or the lack of actuality of the indicators used (measuring past

activities or the results of past strategic planning instead of reflecting the current situation). Also the inability to distinguish environmental factors or the unequal applicability to all branches of knowledge is a source of debate, as recent studies have shown that universities with medical studies or those with engineering schools generally outperform generalist HEIs (Marginson, 2007).

Another critical issue regarding rankings is the way in which institutions are compared with inappropriate peers (Turner, 2005), being inputs and outputs treated in an equivalent manner. In this sense, the general trend has consisted in value research more highly than teaching (Shin and Toutkoushian, 2011), and this somehow makes no sense. In their first stages, students apply for universities to learn and to get a degree, but few of them are going to enrol in a master or a PhD program. This means that a professor could be an excellent researcher but if their teaching skills are weak, students' satisfaction would be very poor, and a fair ranking should reflect the inability of the professor to teach.

Similarly, we found that information on the student cohort is often used or interpreted as an indicator of institutional selectivity, the number of citations and publications in internationally-rated journals is used as an indicator of academic quality, the economical budget denotes the quality of infrastructure, employment records indicate the quality of graduates, and reputation is measured by an aggregate of its overall status and standing. It is clear that not all the metrics are the most suitable indicators for what they actually represent. Again, we found that simplification and generalization compromise the reliability of the ranking.

In other words, difficulties arise from every little step and possible biases must be anticipated as a consequence of the assumptions made during the process (Dill and Soo, 2005; Van Dyke, 2005). Precisely the choices made while composing the ranking reflect the view, the values and the objectives of the developers, and because evidence suggests that rankings do influence behaviour, the choice of metrics is critical. Thus, although ranking systems appear to evaluate universities as a whole, no ranking system can cover all purposes of higher education from the point of view of all stakeholders.

2.3. Influence of rankings on stakeholders

Concerning the use of rankings and their impact over consumers, we first need to identify who are the potential customers of universities. While students are perhaps the most obvious client, many other stakeholders also act as customers (Quinn et al., 2009;

Díaz-Méndez and Gummesson, 2011). These include students' parents, staff/faculty members, research sponsors, local and national authorities, private/public institutions, future employers of students, and society. All these actors have different attributes and perceptions of service quality.

Previous studies have investigated how rankings are influencing university's key stakeholders (Clark, 2007; Griffith and Rask, 2007; Hazelkorn, 2007; 2009; Luca and Smith, 2013). Rankings are designed to assist students to make well-informed choices, fulfilling a public service role that aimed to inform undergraduate students and their parents (Hou et al., 2012). Thus, rankings are used to facilitate their choice about what university to enrol in, even though some research confirms that such decision may also be influenced by partnership and family ties (Hazelkorn, 2009).

Because rankings do influence strategic planning, university managers should acknowledge that an equilibrium between internal (improvement-oriented) and external (accountability-oriented) mechanisms is essential for a successful quality assurance system at universities. Rankings stress institutions to improve their performance. This pressure can be internal, based on the desires for prestige, but it can also come from outside as a performance requirement imposed by governmental agencies to lift the university's overall position. Therefore, these assessment tools help HEIs in identifying their strengths and weaknesses, redefining their strategic plans and re-establishing priorities (i.e. resource allocation/investment) (Hazelkorn, 2007). However, they also can be used by HEIs to set up specific goals aiming at improving their position in these rankings instead of matching the university's strategy.

Finally, governments' attitude against rankings is perhaps the most unexplored of the three. From this perspective, rankings act as assessment tools that measure the nation's economic strengths and aspirations, being even considered as quality indicators of the higher education system of the region/country. Despite governments tend to expropriate the merits achieved by universities if they are well ranked, the truth is that they generally receive partial support. The current debate at this level is now focused in whether it is better to have few world-class universities (Altbach, 2004), that is, few centres of excellence with greater vertical (reputational) and horizontal (functional) differentiation; or a world-class system, providing support to excellence wherever it exists (by missions or functions).

Regardless the point of view, there is no doubt that the way in which a university is ranked is directly tied up to institutional quality and reputation. This observation

reinforces the argument of Reed et al. (2012) which state that a clear relationship exists between a culture of quality, branding and reputation. Thus, universities are likely to desire a good positioning in these rankings, as being placed in the top 50 or 100 worldwide is positively related to visibility and brand awareness.

3. Ranking systems in Spain

As higher education has become globalised, the geographical horizon of traditional rankings has also been widened. Nevertheless, although worldwide university rankings are achieving greater penetration and significance, many individual countries are developing their own rankings. This is so because biases and obstacles exist when comparing universities from different countries. Said differently, countries differ in their history, culture, educational traditions and perspectives. As a result, we find that several authors point out that these environmental factors can impact the structure of their universities (Shin and Toutkoushian, 2011; Jöns and Hoyler, 2013). Henceforth, they should be taken into account.

In Spain, the concern to establish an appropriate framework in which to make comparisons between universities in terms of quality began to take shape with a seminar (*“Towards a classification of universities according to quality criteria”*) held in 1989 and sponsored by the Spanish Secretariat of State for Universities and Research. From then, the interest for measuring university’s quality increased, and resulted in the *National Plans of Quality Assessment*, driven by the University Council and implemented between 1995 and 1999. The objective of the aforementioned plans was threefold (Pérez-Esparrells and Salinas, 1998): encourage institutional assessment of university quality, promote the development of an assessment method in accordance with the current practices at other universities in the European Union, and provide accurate and relevant information that stimulates and improves the internal assessment of universities for the benefit of both the university and the region, serving as a basis for decision-making.

As of today, there is a wide range of information sources, including official and governmental institutions (e.g. Spanish Institute of Statistics, INE; Spanish Foundation for Science and Technology, FECYT; Spanish Association of University Rectors, CRUE; Network of Spanish Technology Transfer Offices, RedOTRI; Ministry of Science and Innovation, MICINN; Ministry of Education, Culture and Sport, MECD), accreditation agencies (National Agency for Quality Assessment and Accreditation,

ANECA; Spanish Commission for the Evaluation of Research Activity, CNEAD), and independent organizations and research centers (e.g. COTEC, Spanish Network of Technology Transfer Offices, SCImago, 4U Alliance, Universidad de Granada). Nevertheless, there are still significant gaps in the information reported by these organizations. The lack of a systematic process to collect comprehensive data for all the universities, the intangible and unquantifiable nature of some activities, the mismatches in data reported by different organisations or an inappropriate grouping of indicators constrain the assessment of universities' quality.

Nonetheless, the creation of the FECYT and the appearance of two of the most comprehensive databases on the Spanish higher education system (CRUE and RedOTRI) have boosted the emergence of studies and ranking systems assessing the performance and quality of Spanish universities, either as a whole, or by departments, disciplines and missions (teaching, research and knowledge transfer).

The first ranking of Spanish universities was published in 2002 in the *Gaceta Univeristaria*, and was conducted by researchers from the Universitat de Barcelona and the University of Pennsylvania. Table 1 lists some of the most important Spanish rankings that stand out and are still valid as of today.

< Insert Table 1 about here >

Five typologies are identified. The first group includes those rankings based on a composite indicator that takes into account the multiple activities that universities face when simultaneously dealing with teaching, research and knowledge transfer objectives. The second group comprises those rankings that compare universities by homogeneous groups according to academic disciplines or degrees offered, this way, potential biases arising from differences in the areas of knowledge are reduced. The third group embraces those approaches that rank universities according to specific individual indicators, generally, related with the quality of the research output. The fourth group considers those approaches that compare the different positions in which Spanish universities are listed in major international rankings. Finally, the last group uses performance measures and web metrics to sort universities.

Even though the methodology used in the above-mentioned rankings substantially differs from one to another giving rise to significant points of disagreement, similarities are found. First, it is worth noting that all these rankings are pioneers and undoubtedly

raise new thoughts on how to undertake the difficult task of evaluating university quality (Pérez-Esparrells and López-García, 2009).

Second, information sources used to compile the data are quite homogeneous. As for the year of publication, they all have a relative short life, being the *Ranking “50 carreras” El Mundo* the oldest (10 years, since 2002). Note that although both the *IUNE Observatory* and the *Meta-Ranking EC3* were launched in 2012, information reported starts in 2002 and 2003 respectively. All rankings listed in Table 1 have an annual publication frequency with the exceptions of the *IAIF index of university quality* and the ranking of Polo-Otero published only once both in 2010, and the rankings of the *Fundación CYD* and Corera et al. which up to date have been published on a biannual basis.

Third, an in-depth analysis of the indicators used, reveals that the data set comprises information of at least two academic years as the analysis of only one year is not very stable because of potential cyclical deviations. Other common features shown are the incorporation of a productivity indicator to avoid size effects, the use of financial indicators, or the search for new ways of collecting and processing research outputs preventing certain scientific fields from appearing undervalued.

Fourth, very few rankings include third mission indicators in their set of variables; instead, they primarily focus their attention on the quality of the research outputs, followed by those oriented to teaching quality attributes. This can be explained by the difficulties in obtaining relevant and reliable data regarding third mission activities. Consequently, this dimension is usually acknowledged for its growing importance over time but it is not considered.

4. Comparison of Spanish rankings that use a composite indicator

4.1. Methodology

Given the heterogeneity of ranking systems, in the literature it is suggested that for a better improvement, rankings should recognize the diversity of institutions and their various functions. Also the *Berlin Principles on Ranking of Higher Education Institutions* (IREG, 2006) adopted in May 2006 reinforce the idea that these assessment tools should take into account the linguistic, cultural, economic, and historical contexts

of the higher education systems being ranked, as not all nations share the same definition of what constitutes “university quality”.

Based on this premise, in this study we focus on rankings being conceived in Spain for the evaluation of their own domestic higher education system. Particularly, we concentrate on those rankings that use a composite indicator to rank universities (first four rankings in Table 1). Because of their capacity of synthesizing complex information and aggregating multidimensional information into a single number, composite indicators are widely and increasingly used (Nardo et al., 2005). This trend also applies for university rankings, where the use of a synthetic indicator enables users to effectively compare complex dimensions and facilitates communication with the general public (Murias et al., 2008).

At this point, two main questions are in order: How different is one ranking from another? Are we converging to more homogenous measurement approaches? A two-step analysis is proposed. As for the first question, we qualitatively scrutinise the indicators used in the four rankings selected. As for the second question, we empirically test if Spanish universities are ranked statistically significantly different by correlating the results of the rankings studied. Due to the heterogeneity of the samples considered in the various rankings, this second stage analysis has been restricted to the entire set of Spanish public universities (47).

4.2. List of indicators

Table 2 summarises the main characteristics of the selected rankings using composite indicators. As it can be observed, the time span comprised varies notoriously; being the rankings elaborated by Buela-Casal et al. and Polo-Otero the ones that consider a larger period of time.

< Insert Table 2 about here >

In order to provide a meaningful comparison of how university quality is being measured, all selected rankings were submitted to an in-depth analysis. Indicators used were extracted and classified, grouping those of similar nature in the same block. Table 3 gives evidence that, to some extent, these benchmarking tools somehow convergence around the definition of academic quality.

< Insert Table 3 about here >

From this table it can be inferred that indicators have been categorized in six dimensions. While the rankings of Buesa et al. and the Fundación CYD use a wide variety of indicators and incorporate at least one variable from each category, those of Buéla-Casal et al. and Polo-Otero are based on a few variables and concentrate on the use of indicators that approximate the quality of several outputs. Precisely, measurements pay more attention on research and teaching outputs rather than on inputs. Third mission outputs are practically obviated.

Indicators used to evaluate teaching quality mainly focus on achieving students' success. However this success, far from being easily quantifiable, reflects the ambiguity inherent in the term. Feasible data that allow incorporating appropriate variables are also difficult to obtain, mainly because information from universities usually cannot reflect the university's teaching capacity but rather the students' performance. Measures that aim to proxy the quality of the learning processes suffer from a similar problem, and only focus on the extent to which students advance in their academic process.

The research mission is by its nature competitive, and many international rankings use research outputs as their main influential indicators (Shattock, 2009). This trend also applies for Spanish university rankings. Certainly, the relationship between research metrics and research quality is an endless source of debate. As Table 3 shows, the most commonly used indicators tend to be linked to the use of bibliometric data. In our case, all four rankings take into account the number of papers published in scientific journals (and particularly in those journals indexed in the Science Citation Index and the Social Science Citation Index). Such a measure not only reflects quantity but also quality aspects of research. This is so because papers have been submitted to journals with a blind-peer review system, and they are published following quality standards accepted by the academic community.

A common feature that should be highlighted relates to universities' size. Almost all variables are standardised by the number of students or the number of academic staff in order to eliminate bias regarding the size of the institutions.

Finally, it is important to remark that each of these four rankings uses different assumptions and weightings. Nevertheless, none of them consider all potential activities related to university's objectives and missions. This means that they still present an incomplete picture of universities' quality; therefore, they only illustrate a partial result.

4.3. Correlation analysis

As pointed in the introduction section, it is expected that differences in the way universities are ranked tend to diminish when comparing results from rankings that have been developed for and by a particular country. In order to test this hypothesis a correlation analysis is conducted, looking for parallelisms between those rankings that, by method, dates and/or dimension, share similar traits.

To this end, we first evaluate the consistency of each ranking over time, by correlating the results of the different editions. As shown in Table 4, all rankings that have been published more than once (Buena et al. and Fundación CYD) are positively correlated ($p\text{-value} < 0.0000$). As indicators used have remained unchanged, this means that fluctuations from one year to another are relatively small, indicating that universities improve or worsen their quality gradually being difficult to observe abrupt changes in the way universities are sorted from one year to another.

< Insert Table 4 about here >

Second, we correlate those rankings that by dates and dimensions of university quality can be compared. Table 5 reports the results, indicating a positive and significant relationship in the way universities are ranked.

< Insert Table 5 about here >

This finding stands as a key result as it gives support to our argument that although the method used and the number and type of variables vary from one ranking to another, the ranking systems analyzed show some degree of convergence. Nevertheless, this result should be taken with a grain of salt as this only holds when the periods and the quality dimensions considered are alike.

It is important to recall that these rankings have been specially designed for the assessment of Spanish universities, so it is not surprising that the indicators used may differ from those of other international rankings (e.g. ARWU, QS World University Ranking). Moreover, indicators employed here are consistent with the most valued factors considered for governmental quality agencies in Spain when supervising the establishment of HEIs' internal quality assurance systems, when auditing degree

proposals and PhD programs, and when evaluating the academic merits of any professor for internal promotion purposes.

5. Discussion and policy implications

Organisations from all sizes and types are hoped to achieve increased competitiveness, efficiency, higher productivity, and higher profitability (Bhasin, 2012; Mousa and Wales, 2012). To attain these goals quality management and customer orientation are becoming increasingly meaningful topics (Battistella et al. 2012; Eggers et al., 2012).

The higher education sector has not been an exception; on the contrary, service quality in the higher education system has received increasing attention during the past two decades. Universities are expected to ensure that all services encounters are managed to enhance stakeholders' perceived quality (Brochado, 2009). Models tested in the literature usually address the overall performance of HEIs. But, as universities are responsible for developing a wide range of activities getting multiple outputs from a set of inputs, the implementation of right measurement instruments is a challenge that practitioners face.

In this context, university rankings are offered as one example in a wider array of accountability instruments that have emerged to assess university quality (Robertson, 2012), adopting a public accountancy role that forces universities to review their strategies and adopt appropriate change management processes.

By the turn of the millennium and the expansion of the media, standards for quality assurance and ranking systems made their entry in Spain. This paper provides a comprehensive survey of university rankings in this particular country. Second, it empirically tests the potential differences in the ways rankings are build and the order in which universities are ranked. Our results reveal that although the plurality and multiplicity of indicators, there is a positive and significant correlation between the rankings analysed, which seems to support our argument that there is some degree of convergence.

However, we acknowledge that it is very difficult to converge into a single way of assessing university quality and it is even more difficult to find one that is universally agreed upon, evidencing the lights and shadows behind league tables and ranking

system. As there are many different missions, structures, and organizational cultures nested in national contexts, historical identities and conditions of possibility, there is no one single definition of “university quality” neither of the “ideal ranking”.

Rankings play a useful role in society, but the challenge is to ensure that they provide an accurate and unbiased picture of the strengths and weaknesses of universities, and recognise the diversity of institutions taking into account the different missions and goals. Following this same line of thought, the Berlin Principles (IREG, 2006) provide implications for the future of rankings and how they may be improved.

Precisely, these premises are the basis for new ranking developments and improvements. One example is the ranking designed by the Centre for Higher Education Development (CHE), an independent procedure that dispenses with holistic rank ordering of institutions in league tables, avoided problems of arbitrary weighting. Accordingly, it admits multiple purposes into the comparison by providing via an interactive web-enabled database the users’ choice to examine and rank identified programs and/or institutional services based on their own criteria, deciding how objectives are weighted.

Further research efforts should be directed towards the creation of a consolidated and strongly contrasted set of indicators that represent the core influential factors that are hypothesised to impact on the quality and performance of universities. Likewise, a more in-depth study is required on those methods that provide consumers a clear understanding of all the factors used to develop a ranking.

We hope this study encourage researchers and policy-makers to develop new ranking systems able to reflect different institutional missions, sizes and geographical locations. Only after analysing disciplines, fields and missions attaining specific dimensions, can a global balance of universities make complete sense.

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List of Tables

Table 1. Classification of Spanish rankings

Type	Ranking	Developer	Aim	Dimension	First published	Data source	Scope ₁	Link/reference
Composite indicator	Ranking in production and research productivity in Spanish public universities	Buela-Casal, Bermúdez, Sierra, Quevedo-Blasco, Castro and Guillén-Riquelme (Universidad de Granada, Universidad de Zaragoza)	Factors used to compound the composite indicator are weighted according to the results of a survey among faculty civil servants.	Global	2008	Web of Science, TESEO*, MECD MICINN, General Directorate of Universities Annual report of Spanish public universities	N	Buela-Casal (2008) Buela-Casal et al. (2009; 2010; 2011; 2012)
	IAIF index of university quality	Instituto de Análisis Industrial y Financiero (Universidad Complutense de Madrid)	Uses a factor analysis with varimax rotation method to build a composite indicator in which to rank Spanish universities.	Teaching Research Global	2009	CRUE Reports TESEO* INE	N	Buesa, Heijs and Kahwas (2009)
	Ranking of Spanish public universities	Fundación CYD	Spanish universities are ranked in different dimensions, each one of them based on various indicators.	Attractiveness Teaching PhD Research	2010	CRUE Reports CNEAI	N	Fundación CYD (2009, 2011)
	Ranking of Spanish universities using the ARWU methodology	Polo-Otero (Fundación CYD)	Uses the methodology employed in the Academic Ranking of World Universities to rank Spanish universities.	Global	2010	www.nobelprize.org www.mathunion.org www.isihighlycited.com CRUE Reports IEDCYT*	N	Polo-Otero (2010)
By disciplines or academic degrees	Ranking 50 carreras El Mundo	El Mundo (magazine)	Collects the 50 most popular degrees and lists the five most recommended universities for each academic degree.	Teaching	2002	(not available)	N	http://hosting01.uc3m.es/semanal3/documentos/rankingelmundo_2012.pdf

Table 1 (continued). Classification of Spanish rankings

Type	Ranking	Developer	Aim	Dimension	First published	Data source	Scope ¹	Link/reference
By disciplines or academic degrees	Rankings I-UGR of Spanish Universities according to Fields and Scientific Disciplines	EC3: Evaluación de la Ciencia y de la Comunicación Científica (Universidad de Navarra and Universidad de Granada) SCI2S: Soft Computing and Intelligent Information Systems (Universidad de Granada)	Ranking of public and private Spanish universities based on research published in international journals of higher impact and visibility.	Research	2005	Thomson-Reuters Web of Science Journal Citation Reports	N	http://www.rankingenuniversidades.es/ Torres-Salinas et al. (2011a, 2011b, 2011c)
	General Ranking and by areas of Spanish universities	Corera, Chinchilla, De-Moya and Sanz (Instituto de Políticas y Bienes Públicos del CSIC, Grupo SCImago)	Ranking of Spanish universities based on some of the indicators used in the SCImago Institutions Ranking. It also ranks Spanish HEIs according to the academic discipline.	Research	2008	SCImago Institutions Ranking	N	Corera et al. (2010, 2012)
By individual indicators	SCImago Institutions Ranking (SIR)	SCImago Research Group	Shows a set of bibliometric indicators that unveil some of the main dimensions of research-devoted institutions' performance.	Research	2009	Scopus	I	http://www.scimagoir.com/index.php

Table 1 (continued). Classification of Spanish rankings

Type	Ranking	Developer	Aim	Dimension	First published	Data source	Scope ¹	Link/reference
By individual indicators	IUNE Observatory	Alliance 4 Universities (Universitat Autònoma de Barcelona, Universidad Autónoma de Madrid, Universidad Carlos III de Madrid, Universitat Pompeu Fabra)	Offers updated and trustworthy information on different aspects of the research activity of the Spanish universities.	Human resources, recognition, research, innovation, competitiveness, trainability	2012	INE CNEAI MICINN MECD Web of Science Red OTRI INVENES*	N	http://www.iune.es/en
Comparison	Meta-Ranking EC3 of Spanish Universities	EC3: Evaluación de la Ciencia y de la Comunicación Científica (Universidad de Granada)	Presents the various positions in which Spanish universities are listed in major national and international rankings.	N/A	2012	ARWU THE-QS Ranking HEEACT Leiden Ranking SIR Webometrics Ranking I-UGR Buela-Casal	N	http://ec3.ugr.es/metaranking/metaranking.html
Web visibility	Webometrics Ranking of World Universities	Cybermetrics Lab research group (Consejo Superior de Investigaciones Científicas, CSIC)	Informs about the performance of universities from all over the world based on their web presence and impact.	Visibility and activity on the web	2004	Majestic SEO ahrefs Google Google Scholar SCImago	I	http://www.webometrics.info/

¹ Scope: N (national), I (international)

* INVENES: created by the Spanish Patent and Trademark Office, TESEO: Database of doctoral theses, IEDCYT: Institute of Documentary Studies on Science and Technology.

Table 2. Characteristics of the selected rankings using composite indicators

Ranking	Authors	Sample	Year published (period analysed)	Weighting
IAIF index of university quality	Buesa, Heijs and Kahwas (2009)	47 Spanish public universities	2009 (2004-2005)	Factor analysis with varimax rotation.
Ranking in production and research productivity in Spanish public universities	Buela-Casal (2008), Buela-Casal et al. (2009; 2010; 2011; 2012)	47 Spanish public universities	2008*, 2009 (2002-2008), 2010 (2004-2008), 2011 (2004-2010), 2012 (2004-2011)	Weighting of the factors according to the results of a survey among faculty civil servants.
Ranking of Spanish public universities	Fundación CYD (2009; 2011)	47 Spanish public universities	2009 (2006-2007), 2011 (2008-2009)	Indicators are equally weighted.
Ranking of Spanish universities using the ARWU methodology	Polo-Otero (2010)	62 Spanish universities (public and private)	2005-2009	Methodology used in the Academic Ranking of World Universities.

*There is no information on the period of time covered by this ranking.

Table 3. List of indicators for the selected rankings

Dimension		Description	Buela-Casal et al.	Buesa et al.	Fundación CYD	Polo-Otero
Relative size of the university		Administrative staff/faculty members		×		
		Administrative staff/students		×		
		Faculty members/students		×	×	
Resource allocation		Total assets/student		×		
		Bibliographic investment/student		×		
		Computer resources/(students or PDI)		×	×	
		Libraries (students/library seats)			×	
		Teaching area (students/classroom seats)			×	
Financial resources		Expenditure/student		×	×	
		R&D expenditure/faculty		×		
Academic attractiveness		% New students residing outside their province			×	
		% Students residing outside their province			×	
		Average rating for access to studies			×	
		New entry students (1st choice)			×	
		Pre-enrolment (1st choice)			×	
		PhD scholarships/faculty members	×			
		PhD programs with "Excellence Mention"	×			
Staff quality		% PhD faculty		×	×	
		Faculty civil servants /faculty members		×		
		Highly cited researchers in 21 broad subject categories				×
		Scientific research periods	×		×	
		Staff of an institution winning Nobel Prizes and Fields Medals				×
Results	Teaching	Abandon rate			×	
		Performance rate		×	×	
		Success ratio		×		
		Alumni of an institution winning Nobel Prizes and Fields Medals				×
	PhD	Theses/faculty		×	×	
		Theses/student	×	×		
	Papers	Publications in JCR-indexed journals/faculty	×	×	×	×
		Publications/faculty		×		
		Publications in Nature and Science				×
	Patents	Patents (applied, awarded or exploited)/faculty	×	×		
	R&D	% R&D income		×	×	
		Projects applied or awarded/faculty	×	×		
Overall performance	Scores of the other indicators/faculty				×	

Table 4. Correlation matrix of ranking results over time

	Buela-Casal et al. (2008) <i>Global</i>	Buela-Casal et al. (2009) <i>Global</i>	Buela-Casal et al. (2010) <i>Global</i>	Buela-Casal et al. (2011) <i>Global</i>	Fundación CYD (2009) <i>Attractiveness</i>	Fundación CYD (2009) <i>Teaching</i>	Fundación CYD (2009) <i>PhD</i>	Fundación CYD (2009) <i>Research</i>
Buela-Casal et al. (2009) <i>Global</i>	0.7402 (0.0000)							
Buela-Casal et al. (2010) <i>Global</i>	0.6878 (0.0000)	0.9330 (0.0000)						
Buela-Casal et al. (2011) <i>Global</i>	0.6543 (0.0000)	0.9117 (0.0000)	0.9297 (0.0000)					
Buela-Casal et al. (2012) <i>Global</i>	0.5890 (0.0000)	0.8801 (0.0000)	0.9053 (0.0000)	0.9269 (0.0000)				
Fundación CYD (2011) <i>Attractiveness</i>					0.5421 (0.0001)			
Fundación CYD (2011) <i>Teaching</i>						0.8426 (0.0000)		
Fundación CYD (2011) <i>PhD</i>							0.6004 (0.0001)	
Fundación CYD (2011) <i>Research</i>								0.6012 (0.0000)

Significance level is presented in brackets.

The dimension considered in each ranking is indicated in italics.

Table 5. Correlation matrix of comparable rankings

	Fundación CYD (2009) <i>Attractiveness</i>	Fundación CYD (2009) <i>Teaching</i>	Fundación CYD (2009) <i>Research</i>	Buela-Casal et al. (2009) <i>Global</i>	Buela-Casal et al. (2011) <i>Global</i>
Buesa et al. (2009) <i>Teaching</i>	0.3994 (0.0072)	0.5263 (0.0002)			
Buesa et al. (2009) <i>Research</i>			0.6904 (0.0000)		
Buesa et al. (2009) <i>Global</i>				0.9297 (0.0000)	
Polo-Otero (2010) <i>Global</i>					0.9269 (0.0000)

Significance level is presented in brackets.

The dimension considered in each ranking is indicated in italics.