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What is a high *h*-index? Analysis in the context of the Spanish marketing field

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Abstract

Purpose – The purpose of this paper is to estimate the average *h*-index of all stable professors working in the field of marketing in all Spanish public universities and to identify the universities and regions with the highest *h*-index. In addition, the authors will explain the impact of some aspects on the level of *h*-index for a given researcher.

Design/methodology/approach – A total number of 585 professors were included in this analysis.

Findings – The results show that women in the field of marketing have a lower average *h*-index than men. The absence of an own marketing department is associated with a decrease in the *h*-index. In addition, the authors find a direct relationship between academic ranking and the *h*-index. Finally, budget per teaching staff is an aspect that also seems to influence the *h*-index.

Research limitations/implications – One of the limitations of this research is the rapid obsolescence of the data. Future research could take private universities into account and could look at other fields of knowledge and other geographical contexts.

Originality/value – To the best of the authors' knowledge, there are no previous works that analyze the situation of a specific field of knowledge in terms of the *h*-index for different universities and the professors who work in them. In addition, some factors that may influence the level of this index are explained. In addition, the authors provide theoretical, practical and (public) political implications of the results.

Keywords *h*-index, Research evaluation, Citation analysis

Paper type Research paper

¿Qué es un índice *h* alto? Análisis en el contexto del área de marketing en España

Resumen

Objetivo – El objetivo de este artículo es estimar el índice h promedio de todos los profesores estables que trabajan en el área de marketing en todas las universidades públicas españolas, e identificar las universidades y

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regiones con el índice h más alto. Además, explicaremos el impacto de algunos aspectos en el nivel del índice h de un investigador determinado.

Metodología – Un total de 585 profesores fueron incluidos en este análisis.

Resultados – Nuestros resultados muestran que las mujeres en el campo del marketing tienen un índice *h* promedio más bajo que los hombres. La ausencia de un departamento propio de marketing está asociada con una disminución del índice h. Además, encontramos una relación directa entre el rango académico y el índice h. Finalmente, el presupuesto por personal docente es un aspecto que también parece influir en el índice h.

Limitaciones de la investigación – Una de las limitaciones de esta investigación es la rápida obsolescencia de los datos. Investigaciones futuras podrían tener en cuenta las universidades privadas y examinar otros campos de conocimiento y contextos geográficos.

Originalidad/valor – Hasta donde sabemos, no existen trabajos previos que analicen la situación de un campo específico del conocimiento en términos del índice h para diferentes universidades y los profesores que trabajan en ellas. Además, se explican algunos factores que pueden influir en el nivel de este índice. También ofrecemos implicaciones teóricas, prácticas y (públicas) políticas de nuestros resultados.

Palabras clave Índice *h*, Evaluación de la investigación, Análisis de citas

Tipo de artículo Trabajo de investigación

什么是较高的 **h** 指数?– 基于西班牙市场营销学科的分析

摘要

研究目的 – 本研究旨在估算西班牙所有公立大学市场营销学科稳定任职教授的平均 h 指数, 并识别 h 指数最高的大学和地区。此外, 本研究还探讨影响研究者 h 指数水平的若干因素。

研究方法 – 本研究共纳入 585 名教授进行分析。

研究发现 – 研究结果表明, 在市场营销领域, 女性研究者的平均 h 指数低于男性。此外, 缺乏独立的市场营销系与 h 指数的降低相关。同时, 学术排名与 h 指数之间存在正向关系。此外, 人均教学预算也似乎对 h 指数产生影响。

研究局限 – 本研究的主要局限之一是数据的快速更新迭代。未来研究可以考虑纳入私立大学, 并扩展至其他学科领域及不同地理区域。

研究原创性 – 据我们所知, 现有研究尚未针对特定学科领域, 系统分析不同大学及其教授的 h 指数水平。此外, 本研究探讨了可能影响 h 指数水平的相关因素, 并提供了理论、实践及公共政策层面的启示。

关键词 *h* 指数, 研究评价, 引文分析

文章类型 研究型论文

1. Introduction

Scientific productivity is essential for economic, social and academic development, as all the research projects carried out by researchers enable the university to maintain close contact with its environment. This aspect is particularly relevant in economic and business knowledge areas, such as marketing.

Academic institutions are increasingly involved in research performance, as are external players who, in most cases, act as sources of funding for research projects developed in such institutions (Kumar and Maurya, 2022). This is especially relevant in a context where the effort to expand and maintain topics of research has recently increased exponentially (Bordons, *et al.*, 2023).

The assessment of scientific production is therefore crucial, not only for analyzing the quality and impact of researchers but for the viability of research projects and their funding too (Herrera *et al.*, 2009). This measurement also serves as a reference for both institutions and countries, providing industry, academics and even students with an overview of the

current situation in the field of knowledge under analysis (Cheng *et al.*, 2003; Taylor and Bicak, 2020).

The most widely accepted way of assessing an academic's reputation is based on the type of journals in which their research is published and their position in all available academic rankings (Guidry *et al.*, 2004), together with the number of times their research is cited by other authors. The importance of publishing in these journals is undeniable, as it plays a fundamental role in tenure and researchers' internal promotion decisions (Cheng *et al.*, 2003). As abovementioned, the impact of a researcher's work also helps institutions to take decisions regarding funding research projects and it is also a standard for awarding prizes to researchers (Kumar and Maurya, 2022).

Similarly, quality research must deliver value to society. In areas related to business management, this involves finding solutions to permanent challenges that arise in the business world (Lindgreen *et al.*, 2021). If so, the metrics that measure a researcher's impact in areas such as marketing become particularly relevant as they can indicate their contribution to the transfer of knowledge to the business world.

The importance of *how much* and *where* research is published for the consolidation of academic careers has made the application of metrics that allow analyzing the quality of this scientific mandatory. Thus, in 2005, Jorge E. Hirsch, professor at the University of California, created the so-called (and well-known) *h*-index (Arencibia-Jorge and Carvajal-Espino, 2008). Nowadays, it is the most widely accepted index by the international research community. Important scientific databases, such as Web of Science (WoS), Scopus or Google Scholar, use it as an indicator of authors' impact (Poirrier *et al.*, 2021). It can therefore be said that this index marks the evolution of science (Koltun and Hafner, 2021). Thanks to its simplicity, it has received a lot of attention, although over time, other indices have been proposed to overcome some of its limitations (Bihari *et al.*, 2023).

However, it is shocking that researchers' knowledge of the *h*-index is much lower in the social sciences than in other disciplines such as medicine. As Kamrani and colleagues (2021) point out, researchers working on these fields must be better informed and have a better understanding of how academic metrics perform.

The objective of this work is twofold: first, to estimate the average *h*-index of all stable professors working in the marketing area in all Spanish public universities. The second goal is to identify the universities and regions with the highest *h*-index.

The marketing area in Spain began to develop around 1993 (Barreiro *et al.*, 2004). At the moment, there are 979 teaching and research staff (Ministerio de Universidades, 2023). This figure is not very high compared to areas such as management or economics, which have 2,604 and 2,246 professors, respectively. Additionally to the descriptive analysis of the *h*-index, this paper will explain how some aspects related to the university itself affect the level of *h*-index for a given researcher.

This research makes a significant contribution to the literature related to the measurement of scientific productivity, because, to the best of our knowledge, there are no previous works that analyze the situation of a specific field of knowledge in terms of the *h*-index for different universities and the professors who work in them. In addition, some factors that may influence the level of this index are explained. The results of our research will allow us to quantify, by comparing all marketing professors at national level, what figure can the National Agency for Quality Assessment and Accreditation (ANECA) consider as "high" when it indicates the use of this aspect as one of the merits to be taken into account in the evaluation of the figures of professor and associate professor of university in the field of economics and business sciences.

Based on the abovementioned goals, we first analyze the usefulness of the *h*-index as a way of measuring scientific productivity. Once this conceptual framework has been developed, we present the empirical methodology. The paper ends with several interesting conclusions, main limitations and further research.

2. The *h*-index as a way of measuring scientific productivity

In 2005, Hirsch proposed a way to relate the number of citations to publications, highlighting those that had a greater number of citations (Araujo Viera *et al.*, 2021). A researcher will have an *h*-index if he/she has published *h* works with at least *h* citations each (Marques, 2013; Ortega-Rubio *et al.*, 2021). This index combines production and impact, so individual performance is measured qualitatively and quantitatively (Dorta-González and Dorta-González, 2011). Therefore, it can be used for different purposes, given that it is valid both when it comes to promotion and recognition at an academic level and to divulge the level of performance (Koltun and Hafner, 2021).

Because of its characteristics, this index is presented as a reliable measure and stands out for its applicability at any level of aggregation and for its robustness, allowing an article cited many times to have no direct influence on this index (Chen *et al.*, 2021). In this context, another advantage arises from correcting biases coming from important collaborations or articles with reduced impact (Arencibia-Jorge and Carvajal-Espino, 2008). To the ease of interpretation and understanding, as well as its usefulness for comparing or classifying, and the fact that it can be calculated at any time in the academic career of an scientific researcher (Koltun and Hafner (2021), Mingers and Yang (2017) add that this index can be applied at the level of researcher, academic department or journal, in addition to being an objective and very useful measure for comparing researchers within the same discipline, or countries (Csajbók *et al.*, 2007).

Although this indicator has been accepted and commonly used by the scientific academia (Bihari *et al.*, 2023), it also has a series of limitations (Antonakis and Lalive, 2008; Bihari *et al.*, 2023; Brito and Rodríguez, 2021; Bi, 2023; Bornmann *et al.*, 2022; Cabezas-Clavijo and Delgado-López-Cozar, 2013):

- The authors of projects indexed in the most notable databases, such as *WoS*, *Google Scholar* or *Scopus*, receive citations from other types of sources that are not included into them (e.g. books, book chapters, working papers or other types of documents) and, therefore, do not contribute to the estimation of the *h*-index .
- The formulation of this index makes it exponentially more difficult to achieve high magnitudes because the demand for citations and articles will be greater. This can lead to problems of professional stagnation on the part of the authors once they reach an "optimal" *h-index.*
- Regarding the roles of the authors and co-authors of the articles, it must be taken into account that not all of them perform the same functions. This is something addressed by Liu *et al.* (2023), Ancheyta (2015) and Bi (2023) who propose different ways of assigning a rating to articles in which more than one author participates taking into account the role they have carried out during the project (Hirsch, 2019 [1]).

The above limitations led Hirsch to develop, in 2010 and 2019, two alternative indicators [2] (*ħ* and *hα)* to address the deficiencies showed by the *h*-index in its own estimation model. Other researchers, such as Leo Egghe and Jin Bihui, have also contributed to the improvement of this indicator by developing alternatives such as the *g-index* and the *R-index* (Egghe, 2006; Bihui *et al.*, 2007) [3].

Although several alternative metrics to the *h*-index have been proposed, none of them has surpassed this magnitude, and it is considered a solid measure of a researcher's impact. That is why, in this paper, we use this indicator as the core element of analysis of scientific performance.

Table 1 shows a summary of the research carried out to date that has studied various variables related to the *h*-index. This table details the area of knowledge under analysis, the variables analyzed and the main conclusions of each work. As Table 1 shows, this paper includes a greater number of variables within a specific field of knowledge and a geographical context.

3. Methodology

The information collection process has been developed in two different steps.

First, the identification of the stable teaching staff (PDI) of the departments or areas of marketing of the existing public universities in Spain has been carried out. We have ignored those public universities that do not have a marketing department or area. Our analysis is focused on 46 universities (Table 2). The data from the Autonomous Cities of Ceuta and Melilla are included in the information from the University of Granada, as the university centers of both autonomous cities depend on it.

For this research, full-time figures were considered who, in addition, had a permanent contract (or similar, in the case of the assistant professor) in their universities. In this way, the figures of full professor, associate professor, aggregated professor – equivalent to associate professor in the Catalan university system – assistant professor (contracted and non-contracted), lecturer professor and associate professor of university school were identified. In addition, those researchers with an *h*-index lower than 1 and those who do not have any publication and those who do not appear in the databases used were skipped.

Based on the universities and figures described above, the total number of 585 researchers were included in this analysis: 40.50% were men. In terms of academic rank, 24.27% were full professors, 39.83% were associate professors, 30.43% were assistant professors (17.95% contracted and 12.48% non-contracted), 0.17% were lecturer professor, 1.37% were associate professor of university school and 3.93% were aggregated professors.

After that, we have identified the *h*-index of each researcher. Specifically, information from this index has been collected in the three most relevant databases: *WoS*, *Scopus* and *Google Scholar*. Working with different databases aims to offer a broader and more complete analysis of the *h*-index, because each database has certain peculiarities, and several differences between the indices can be found. For instance, *Scopus* and *Google Scholar* collect some works/publications that are not listed in *WoS*, given its more restrictive nature, as it collects a smaller number of journals than the other databases. All the information, both on the staff of the marketing department by categories for all universities, as well as the *h*-indexes of each researcher in the three databases, was collected between August 26 and September 16, 2024.

The list of staff by categories in Spanish public universities is shown in Table 3.

4. Results

All analyses in this study were performed using SPSS version 29.

4.1 Descriptive analysis

Table 4 shows the descriptive statistics of the three *h*-index.

As can be seen, the highest average *h-index corresponds to Google Scholar*, followed by *Scopus* and *WoS*, with the average index of *Google Scholar being* almost double that of *WoS*.

Table 1. Summary (in chronological order) of research on influencing variables on the *h*-index

Authors	Geographical context	Knowledge area	Variables analyzed	Main conclusions
Martinez *et al.* (1997)	Spain	Radiodiagnostics	Productivity of Spanish authors in radiodiagnostics	The productivity of Spanish medical literature authors is comparable to other medical journals. Among highly productive authors, 61% also publish in other journals, and nearly 27% submit to foreign ones, but their individual impact remains difficult to assess without further study
Belinchón-Romero *et al.* (2002)	Spain	Dermatology	• Scientific productivity of the Spanish authors in international journals	The 2.3% of the signers of documents (41 of the 1832 citable document authors) are responsible for 24.6% of the total of responsibilities. The five more productive authors were: Requena L, Sánchez Yus E, De Moragas JM, Camacho F and Aliaga A
Estrada-Lorenzo *et al.* (2003)	Spain Spanish America	Health	• Number of authors • Institutions • Geographic scope • Authors' productivity	The productivity of authors publishing in *La revista española de salud pública* is like that of other Spanish biomedical journals, and lower than when studying thematic and territorial areas in more than one publication
McCarty *et al.* (2013)	Worldwide	Several areas	• Number of co-authors • Co-author network structure • Highly productive authors	Most of the variance was explained by the number of co-authors and by the association with highly productive co-authors. Network structure was not predictive
Svider *et al.* (2013)	Worldwide	Otorhinolaryngology	Academic rank	The *h*-index was positively correlated with academic rank, and there were no significant differences between the *h*-index for professors and department directors

(*continued*)

Table 1. Continued

Authors	Geographical context	Knowledge area	Variables analyzed	Main conclusions
Albacete Sáez *et al.* (2013)	Spain	Economy and business management	• Spanish scientific production published between 1997 and 2011 • Main topics researched in 26 most relevant international journals of tourism and hospitality	An increase in publications since 2001, with a preference for journals such as *Tourism Management and Tourism Economics*. It identifies key areas such as marketing and business management. Notes the influence of universities in sun and beach destinations, although institutions are emerging in cultural and inland tourism regions
Ashfaq *et al.* (2018)	USA	General surgery	• Academic rank • Publications	The *h*-index increased with academic rank and number of publications
López-Bonilla et al (2018)	Spain	Tourism and hospitality	• Articles published by prolific authors • Gender • Number of co-authors • Citations • Journals • Institutions and areas of knowledge	Spanish authors publish mainly in tourism and hospitality journals, with *Tourism Management* and *Tourism Economics* standing out. Scientific production is concentrated in areas such as applied economics and marketing, among the most prolific authors, J.L. Nicolau stands out followed by J. Rosselló and D.M. Frías Jamilena
Hu *et al.* (2018)	Canada	Surgery	• Postgraduate degree • Academic rank • Years of practice	Postgraduate degree, academic rank and years of practice are positively correlated with the *h*-index
Monir *et al.* (2020)	USA	Pediatric dermatology	• Scholarship certification year • Academic practice • Academic rank	The *h*-index is positively correlated with time since academic certification, with academic practice, and with academic rank
This investigation	Spain	Marketing	• University • Academic rank • Gender • Budget/teaching staff • University with/without individual marketing department • Spanish region	The academic rank of the researcher, the existence of a marketing department and gender are, in that order, the variables with the greatest influence on the *h*-index. The research budget does not have a significant influence on research capacity

Table 2. Universities included in the analysis

Autonomous University of Barcelona	University of La Laguna	National Distance Education University (UNED)
Autonomous University of Madrid	University of La Rioja	Pablo de Olavide University
University Carlos III of Madrid	University of Las Palmas de Gran Canaria	Polytechnic University of Cartagena
Complutense University of Madrid	University of Leon	Polytechnic university of Valencia
University of A Coruña	University of Lleida	Public University of Navarra
University of Alcalá	University of Malaga	King Juan Carlos University
University of Alicante	University of Murcia	Rovira i Virgili University
University of Almeria	University of Oviedo	University of the Balearic Islands
University of Barcelona	University of Salamanca	University of Valencia
University of Burgos	University of Santiago de Compostela	Jaume I-University of Castellón
University of Cadiz	University of Seville	
University of Cantabria	University of Valladolid	
University of Castille-La Mancha	University of Vigo	
University of Cordoba	University of Zaragoza	
University of Extremadura	University of the Basque Country	
University of Girona	International University of Andalusia	
University of Granada	Miguel Hernández-University of Elche	
University of Huelva		
University of Jaen		

Below, the descriptions of each index are presented for the variables gender, researcher category, university and region. For all variables, except gender, we only show the average for clarity.

Tables 5 and 6 show gender and category variables, respectively, for the three indices.

The results show that the average value for males is higher than that of females for the three indices under analysis. In addition, it is again observed that the three indices follow the same behavior: the higher the academic rank, the higher the average *h*-index for the three databases.

Tables 7 and 8 show the average of the three indices for the university and autonomous community variables, respectively. The universities appear, in both tables, ordered in descending order according to their average *h-index CWoS)*.

The results shown in Table 7 suggest that the trend by university is similar for the three indices analyzed, with lower values for *WoS*, followed by *Scopus* and *Google Scholar*, and with non-significant differences in the ranking of universities for the *WoS index* and *Scopus*.

In first place is the University of Cantabria, which stands out for occupying the top positions in the ranking of Spanish universities in terms of both quality and research capacity, despite its small size compared to other universities.

It is followed by the University of Lleida, of a similar size to the first and one of the oldest in Spain. It stands out because it combines a long university tradition with a young and dynamic structure.

In third place is the University of Zaragoza, the only public university in its region (Aragon). Larger than the two previous ones, it has five campuses and six research institutes of its own.

In terms of region, non-significant differences are observed between the *h-index WoS* and *Scopus*, which offer a very similar ranking, placing Cantabria, Aragón, Castille-La Mancha, Valencian Community, the Region of Murcia and Extremadura among the top six regions.

Table 3. Personnel by category in Spanish public universitiesa

University	FP	AP	CAP	NCAP	APUS	LP	AGP	Total
UA	3	7	0	3	0	0	0	13
UAB	2	3	0	1	0	0	1	7
UAH	1	2	1	1	0	0	0	5
UAL	5	7	1	3	0	0	0	16
UAM	4	6	3	4	0	0	0	17
UB	0	4	0	1	0	0	3	8
UBU	2	2	1	2	0	0	0	7
UC3M	3	5	0	0	0	0	0	8
UCA	0	5	1	4	0	0	0	10
UCLM	7	7	0	0	0	0	0	14
MCU	0	7	7	4	0	0	0	18
UCO	0	1	0	0	0	0	0	1
UDC	2	1	4	6	0	0	0	13
UDG	0	1	0	0	0	0	3	4
UDL	0	0	0	0	0	0	3	3
UGR	12	12	4	1	0	0	0	30
UHU	0	1	2	0	0	0	0	3
UIB	2	2	1	0	0	0	0	5
UJAEN	2	2	2	1	0	0	0	7
UJI	2	9	1	0	0	0	0	12
ULL	0	2	2	1	0	0	0	5
ULPGC	4	3	1	0	0	0	0	8
UM	8	4	6	0	0	0	0	18
UMA	3	12	6	5	0	0	0	26
UMH	1	1	1	0	1	0	0	4
UNED	1	1	2	0	0	0	0	4
UNEX	1	6	0	0	0	0	0	7
UNICAN	3	4	1	1	0	0	0	9
UNILEON	0	7	3	2	0	0	0	12
UNIOVI	5	7	2	3	0	0	0	17
BIND	3	2	1	0	0	0	0	6
UNIZE	14	17	2	4	0	0	0	37
UPCT	0	2	2	0	1	0	0	5
UPF	2	1	0	0	0	0	5	8
UPNA	2	2	4	2	0	0	0	10
UPO	4	2	1	0	0	0	0	7
UPV	1	17	0	0	1	1	6	26
UPVA	1	4	4	0	0	0	0	9
URJC	4	9	19	12	0	0	0	44
VRU	1	2	0	0	0	0	2	5
US	8	11	3	3	3	0	0	28
USAL	4	3	1	2	0	0	0	10
USC	2	5	2	2	0	0	0	11
UV	17	11	4	6	0	0	0	38
GRAPE	3	8	3	0	0	0	0	14
UVIGO	3	6	6	0	1	0	0	16
Total	*142*	*233*	*105*	*73*	*8*	*1*	*23*	*585*

Notes(s): [a]Data collected between August, 26 and September, 16, 2024 – FP : full professor; AP : associate professor; APC : contracted assistant professor; NCAP : non-contracted assistant professor; APUS : associate professor of university school; LP : lecturer professor; AGP : aggregated professor

Table 4. Descriptive statistics (*h*-index, *Google Scholar*, *Scopus* and *WoS*)

Index	Statistical
h-index *Google Scholar*	
Average	17.02
Median	15.00
SD	11.84
h-index Scopus	
Average	10.34
Median	9.00
SD	7.95
h-index WoS	
Average	8.63
Median	7.00
SD	7.08

Table 5. Average *h*-index by gender

	Male		Female	
Index	Average	SD	Average	SD
Google Scholar *h*-index	19.70	12.58	15.12	10.92
Scopus *h*-index	12.02	8.89	9.19	7.03
WoS -index	10.15	8.11	7.58	6.06

Note(s): SD = standard deviation

Table 6. Average *h*-index by academic rank

Academic rank	Google Scholar	Scopus	WoS
Full professor	28.98	18.78	15.52
Associate professor	15.99	9.36	7.92
Contracted assistant professor	9.88	5.63	4.55
Non-contracted assistant professor	6.61	4.13	3.62
Associate professor of university school	–	2.67	2.00
Aggregated professor	15.25	9.09	7.18

It is evident that research resources (and, therefore, the ability to carry out research) differ between universities. To simplify the presentation of the data and thus facilitate its analysis, the universities were grouped according to the average of their budget [4] teaching staff. Two groups were generated: Group A (universities with a budget/teaching staff lower than the average in 2023–3024, €106.587,79) and Group B (universities with a budget/teaching staff higher than average) (see Table 9).

Contrary to our expectations, the results show that, for all three indices, universities with a budget lower than the average value (€106.587,79) have a higher *h*-index .

Table 10 shows the average value of each index for those universities that have their own marketing department (Group D), and for those others that do not have their own department

Table 7. Average *h*-index by university

University	WoS	Scopus	Google scholar
UNICAN	16.11	19.56	16.00
UDL	15.67	18.67	27.67
UNIZE	13.89	18.11	27.34
UGR	13.48	15.34	21.30
UV	12.84	14.89	22.24
UCLM	12.00	13.21	22.85
UPO	11.86	14.57	25.60
UJI	11.08	12.75	21.42
UHU	11.00	12.50	15.00
ULPGC	11.00	12.38	21.88
UM	10.82	12.94	21.40
UNEX	10.00	13.00	20.83
UBU	9.57	11.00	15.71
US	9.00	10.96	16.63
UPF	8.63	11.25	16.38
USAL	8.30	9.70	13.00
UVA	8.29	10.93	18.71
UPNA	8.20	9.10	12.14
UAH	8.00	8.50	14.25
UA	7.92	8.69	14.70
UAL	7.81	9.25	16.77
USC	7.78	8.70	18.80
UAB	7.71	9.71	17.00
UPCT	7.60	7.40	7.75
ULL	7.20	7.80	12.75
UAM	7.18	8.12	15.80
UC3M	7.00	7.75	12.00
UDG	7.00	8.00	12.75
UMA	7.00	7.88	12.50
UVIGO	6.93	7.93	16.78
UNIOVI	6.88	9.35	13.86
UPVA	6.56	8.50	12.13
UJAEN	6.43	7.14	19.50
BEND	6.33	9.33	14.75
UNILEON	5.91	6.92	11.78
UB	5.75	7.50	21.80
UPV	5.48	6.36	15.79
UDC	5.46	7.38	12.55
UIB	5.40	6.60	17.75
URJC	5.13	6.03	11.86
UCM	5.00	6.83	15.40
UNED	4.00	7.00	10.00
UCA	3.70	4.10	10.89
UMH	3.50	3.50	8.75
URV	0.25	10.00	17.00

but do have a knowledge area being part of a more general (normally business-related) generic department (A).

As would be expected, Table 10 shows higher values in those universities that have their own [5] marketing department. Probably, the reason for this superiority is because of the greater capacity and, above all, the greater autonomy in managing their own resources of

Table 8. Average *h*-index by region

Spanish region	WoS	Scopus	Google Scholar
Cantabria	16.11	19.56	16.00
Aragon	13.89	18.11	26.83
Castille-La Mancha	12.00	13.21	22.85
Valencian Community	10.49	12.19	19.18
Murcia Region	10.09	11.68	18.53
Extremadura	10.00	13.00	20.83
Canary Islands	9.54	10.62	18.83
Andalusia	9.11	10.37	16.80
Navarre	8.20	9.10	12.14
Castille and Leon	7.88	9.53	15.20
Catalonia	7.21	10.18	18.13
Principality of Asturias	6.88	9.35	13.86
Galicia	6.61	7.95	14.92
The Rioja	6.33	9.33	14.75
Madrid's community	5.75	6.85	12.92
Basque Country	5.48	6.36	14.87
Balearic Islands	5.40	6.60	17.75

Table 9. Average *h*-index by group of universities according to budget/teaching staff

Group	Google Scholar	Scopus	WoS
A	17.56	10.75	8.90
B	16.53	9.94	8.36

Note(s): A : Universities with a research/teaching staff budget lower than €106.587,79; B : Universities with a research/teaching staff budget greater than €106,587,79

Table 10. Average *h*-index according to the existence of a marketing department

University	Google Scholar	Scopus	WoS
A (area)	15.39	9.21	7.64
D (department)	20.39	12.65	10.65

Note(s): A : University without its own department (area integrated into a larger department); D : University with its own department of marketing

those universities with a marketing department (so, they do not have to share financial resources with other areas of knowledge).

4.2 Regression analysis

Once the descriptive analyses have been developed, the next objective is to analyze the influence that certain aspects – both the researcher his/her university of affiliation – have on the *h*-index. To do this, we have estimated a multiple linear regression model in which the dependent variable is each researcher's *h*-index (*WoS*), using as independent variables gender, academic rank [6], the existence/absence of own marketing department and the

general budget/teaching staff of the university of affiliation. These analyses were performed for only one of the indices for clarity. In particular, we use the WoS *h-index*, version because it is the database with the most solid information and the most used, generating useful information for researchers who evaluate scientific activity.

According to the final resulting model, the estimate of the index is as follows:

$$WoS\ h\text{-index} = 1.217 + 2.135\,\text{Rank} - 1.903\,\text{Gender} - 2.153\,\text{Area}$$

Regarding the standardized coefficients for each variable (see Table 11), three aspects (at 95% confidence) have a significant influence on the *h*-index (*WoS*): academic rank, gender and the existence or absence of a marketing department. The first of them is the one that has the greatest impact (0.407) on the *h*-index. The next of the variables with a significant impact on the WoS *h*-index is area (–0.144), followed by gender (–0.132). The relationship between these two aspects and the *h*-index is negative. As area is a dummy variable (1 = university with no in-house marketing department, 0 = university with marketing department), the result obtained indicates that the absence of an own marketing department is associated with a decrease in the *h*-index. Gender is also a binary variable (1 = female, 0 = male), showing that males are more likely to have a higher *h*-index.

Regarding the variable that includes the budget *per* teaching staff, we must note that it is significant at 90%, which seems to indicate that it is an aspect that, somehow, significantly affects *h*-index. For this reason, we have additionally estimated a regression model (Table 12) for each group of universities based on the value of the budget/PDI (Group A with a budget lower than €106.587,79, and Group B with a budget greater than this figure).

The results in Table 12 confirm the significant role that academic rank continues to play in estimating a researcher's *h*-index. Thus, in both groups of universities, the variable is significant (95%). The "budget per teaching staff" variable, as in the global model (see Table 10), is still not significant, although it is true that in the case of universities with a budget lower than the average value, it is significant at 90%, which seems to indicate that, indeed, in universities with a smaller budget, the level of available resources per researcher influences, in some way, his/her ability to obtain a higher *h*-index. What is striking is that this potential influence is negative. In universities with budgets above average, this variable has no impact on the researcher's *h*-index.

It is noteworthy that the presence or absence of a marketing department ceases to be a variable of impact on the researchers' *h*-index in universities with lower budgets.

Table 11. Estimation of the regression model (dependent variable: *h WoS index;* independent variables: gender, academic rank, existence/absence of marketing department, total budget/teaching staff)

–*Rr*	R^2	Adj. R^2	*F*	df		*b*	*SE*	*β*	*t*	Sig
0.480	0.231	0.225	41.700	4	*Constant*	1.217	1,710		0.751	0.453
					Rank	2.135	0.199	0.407	10.737	<0.001
					Gender	−1.903	0.539	–0.132	−3.531	<0.001
					Area	−2.153	0.586	−0.144	−3.671	<0.001
					Budget/Teach. Staff	−1.909E-5	0.000	−0.065	−1.655	0.099

Note(s): R : Pearson correlation coefficient; R^2 : Coefficient of determination; Adj R^2 : Adjusted coefficient of determination; F : F-statistic; df = degrees of freedom; b = regression coefficient; β = standardized regression coefficient; *t* = *t*-statistic; Sig = Significance level

Table 12. Regression model for two groups of universities according to budget/teaching staff

R	R^2	Adj. R^2	*F*	df		*b*	SE	*β*	*t*	Sig
Group A Model (*budget/teaching staff below* €106.587,79)										
0.390	0.152	0.140	12,110	4	*Constant*	6.269	3.187		–1.967	0.050
					Rank	1.691	0.277	0.354	6.102	<0.001
					Gender	−2.277	0.792	–0.162	−2.875	0.004
					Area	−0.181	0.803	0.013	−0.225	0.822
					Budget/Teach. Staff	−6.065E-5	0.000	−0.098	−1.664	0.097
Group B Model (*budget/Teaching staff above* €106.587,79)										
0.607	0.369	0.360	41.038	4	*Constant*	−2.881	3.116		–0.925	0.356
					Rank	2.769	0.287	0.475	9.650	<0.001
					Gender	−1.094	0.712	–0.075	−1.535	0.126
					Area	−4.627	0.836	−0.274	5.535	<0.001
					Budget/Teach. Staff	−2.853E-6	0.000	−0.007	−0.145	0.085

Note(s): R = Pearson correlation coefficient; R^2 : Coefficient of determination; Adj R^2 : Adjusted coefficient of determination; F : F-statistic; df = degrees of freedom; b = regression coefficient; *β* = standardized regression coefficient; *t* : *t*-statistic, Sig = Significance level

4.3 Researchers ranking

Finally, we find it interesting to analyze which researchers at the Spanish context have the highest levels of citation. Table 13 shows the top ten researchers nationwide who have the highest *h*-index [7].

It should be noted that the Universities of Zaragoza, Granada and Valencia are the universities with the greatest presence in this top ten. These three universities together account for nine out of 12 professors in this ranking, while the University of Malaga, the University of Cantabria and the King Juan Carlos University contribute one professor each. This result is very consistent with the analysis developed previously by universities, although it is true that the university with the second highest average *h*-index (Lleida) does not contribute any researchers (nor do the universities of Castilla-La Mancha, Pablo de Olavide or the Jaime I University, which are also at the top of the ranking). Overall, the results suggest that most of the professors at these three universities have a high *h*-index.

Table 13. Ranking of researchers according to *h*-index

Researcher	Academic rank	*WoS*	*Scopus*	*Scholar*	University
1. Flavian Blanco, Carlos	Full professor	51	60	77	Zaragoza
2. Casaló Ariño, Luis Vicente	Full professor	40	45	55	Zaragoza
3. Liébana Cabanillas, Francisco J.	Full professor	37	40	52	Granada
4. Bigne Alcañiz, Jose Enrique	Full professor	33	42	–	Valencia
5. Muñoz Leiva, Francisco	Full professor	32	33	46	Granada
6. Gil Saura, Irene	Full professor	31	33	57	Valencia
7. Molinillo Jiménez, Sebastian	Full professor	30	33	44	Malaga
8. Rodríguez Del Bosque, Ignacio A.	Full professor	29	33	–	Cantabria
9. Saura Lacárcel, José Ramón	Associate professor	29	30	44	King Juan Carlos (Madrid)
10. Belanche Gracia, Daniel	Full professor	28	33	40	Zaragoza
11. Andreu Simo, María Luisa	Full professor	28	31	43	Valencia
12. Frías Jamilena, Dolores María	Full professor	28	26	28	Granada

Carlos Flavián Blanco, PhD, full professor at the Department of Marketing Management and Market Research at the University of Zaragoza, with an *h*-index of 51 (WoS), 60 (Scopus) and 77 (G*oogle Scholar*), is the researcher with highest *h*-index in the field of marketing in Spain, a considerable difference from the second place. His most impactful papers "The role played by perceived usability, satisfaction and consumer trust on website loyalty," cited 913 times in *WoS* since the year of its publication, 2006, in the *Information and Management*. The goal of this paper is to measure the loyalty of users who browse websites according to their usability. His second most cited work in *WoS* is "The impact of virtual augmented and mixed reality technologies on the customer experience," with 416 citations since its publication in 2019 in the *Journal of Business Research*. This article aims to provide a better understanding of the technologies, both current and potential, that can support or enhance customer experiences.

Following professor Flavián-Blanco, the second place in the ranking belongs to Luis Vicente Casaló-Ariño, who has an *h*-index of 40 (*WoS*), 45 (*Scopus*) and 55 (*Google Scholar*). He is a full professor at the University of Zaragoza and his work with the highest number of citations (473) in *WoS* is "Influencers on Instagram: Antecedents and consequences of opinion leadership," published in 2020 in the *Journal of Business Research*. This study aims to identify some key antecedents and consequences of opinion leadership in the fashion industry on the Instagram platform, and its results have important implications for the industry. His second work with the greatest impact (301 citations) is "Determinants of the intention to participate in firm-hosted online travel communities and effects on consumer behavioral intentions," published in 2010 in *Tourism Management*. This study addresses the impact of corporate-hosted online travel communities in the tourism sector. Consumers' intention to participate in these communities and other related behaviors are explored. The paper integrates the theory of planned behavior, the technology acceptance model and the theory of social identity into a single model. Additionally, the relationship between community involvement and two behaviors that can benefit the host company is examined.

The third professor in this ranking is Francisco José Liébana Cabanillas, PhD, full professor at the University of Granada. His most cited paper (300, *WoS)* is "Antecedents of the adoption of the new mobile payment systems: The moderating effect of age," published in 2014 in *Computers in Human Behavior.* The purpose of this study is to test an integrative theoretical model that allows determining the relative importance of certain factors (i.e. external influences, ease of use, attitude, usefulness, trust, risk) for the adoption of a new mobile payment system advertised in new electronic environments, as well as analyzing the eventual moderating effect of the age of the consumer in the use of this tool. The second article most cited is "A SEM-neural network approach for predicting antecedents of m-commerce acceptance," published in 2017 in the *International Journal of Information Management* whose objective is to determine the key factors that influence the adoption of the mobile commerce by consumers.

Full professor at the University of Valencia, José Enrique Bigné-Alcañiz, PhD, is ranked fourth in the top ten. His 2005's publication in *Tourism Management* is the most cited paper in *WoS* (559). This paper titled "The theme park experience: An analysis of pleasure, arousal and satisfaction," explains, through an emotion-cognition model, how the environment of a theme park influences the perception of its visitors. The next paper, with 264 citations, is "The functional-psychological continuum in the cognitive image of a destination: A confirmatory analysis" published in 2009, also in *Tourism Management.*

As a full professor at the University of Granada, Francisco Muñoz Leiva, PhD, is ranked fifth. His two most cited papers accumulate 300 and 242 citations (WoS), respectively. The first of them, published in 2014 in *Computers in Human Behavior*, is titled "Antecedents of

the adoption of the new mobile payment systems: The moderating effect of age." It is the same paper with the greatest impact by Professor Francisco José Liébana Cabanillas, ranked third. The second paper was published in 2007 in *Information and Management*. The title is "Web acceptance model (WAM): Moderating effects of user experience," and its goal is to know the intention of a user when returning to a website, based on in Davis' technology acceptance model, with perceived usefulness (for more experienced users) and ease of use (for users less familiar with new technologies) being the two key factors of the study.

Ranked sixth, we find full professor Irene Gil Saura, from the University of Valencia. Her article with the highest number of citations (1,022), published in 2002 by the journal *Annals of Tourism Research*, is "Destination image: Towards a conceptual framework" and makes a review of the concept of destination image from a perspective of marketing, in addition to offering a series of statistical models that allow it to be measured.

Following Professor Irene Gil Saura, we find Sebastián Molinillo Jiménez, PhD full professor at the University of Málaga. The paper "DMO online platforms: Image and intention to visit," published in 2018 in *Tourism Management*, is his most cited publication. Its goal is to explore the moderating effects of online platforms of destination management organizations on destination image through a conceptual model.

In eighth position, we find full professor at the University of Cantabria Ignacio Alfredo Rodríguez Del Bosque, PhD. He has the same WoS *h*-index (29) as associate professor José Ramón Saura Lacárcel, but a higher index in Scopus (33). His most cited work in *WoS* is "Tourist satisfaction: A cognitive-affective model," published in 2008 in *Annals of Tourism Research*. It explores the cognitive and affective psychological processes that an individual goes through during the previous and after a tourist experience.

Regarding Professor José Ramón Saura Lacárcel, he is the Vice-Dean of Research, Internationalization and Associate Professor in the Faculty of Business Economics at King Juan Carlos University, His most cited work in WoS, "Using Data Sciences in Digital Marketing: Framework, methods, and performance metrics," was published in 2021 in the *Journal of Innovation and Knowledge*. This study reviews the methods, uses and performance metrics of data sciences in digital marketing strategies through an analysis of the existing literature.

Ranked tenth, we find full professor Daniel Belanche Gracia, PhD, from the University of Zaragoza. His most cited work in *WoS*, "Service robot implementation: a theoretical framework and research agenda," was published in 2020 in *Service Industries Journal*. This article aims to complement research on the human appearance of robots, focusing on the factors that service managers should consider when implementing them. A three-part framework that includes robot design, customer and service encounter characteristics is proposed to determine its optimal fit.

María Luisa Andreu Simo, PhD, full professor at the University of Valencia, is ranked 11th in this ranking. Her publication with the greatest impact (559 citations), from 2005, was published in *Tourism Management* and is titled "The theme park experience: an analysis of pleasure, arousal and satisfaction." This paper is coauthored by professor Bigne Alcañiz (it is his paper with the greatest impact).

Last professor in top ten is Dolores María Frías Jamilena, PhD, full professor at the University of Granada. The paper "Internet vs travel agencies on pre-visit destination image formation: An information processing view," published in 2007 in *Tourism Management*, is her most cited publication. The objective of the article is to provide a deeper understanding of the factors affecting the formation of a tourism destination image, specifically analyzing the influence of the Internet, in competition with travel agencies, on the tourist's pre-visit image.

Table 14 shows, as a summary, the most cited contribution of each author, as well as the year and journal in which the research was published.

5. Discussion

The results obtained in this study allow us to extract several important observations related to scientific productivity in the field of marketing and its determinants in the Spanish context.

- First, the results obtained show a similar trend regardless of the *h*-index used (WoS, Scopus and Google Scholar). The reason may be that the three indices evaluate publications in a similar way. Our conclusion is supported by Delgado-López-Cózar and Repiso-Caballero (2013), who point out that there are hardly any differences in the ranking of leading publications in these three databases, in the same discipline. Nevertheless, it is observed that the measures of central tendency take the lowest value for WoS (8.63), followed by Scopus (10.34) and, finally, Google Scholar (17.02). This order has already been pointed out in previous research (Harzing and Alakangas, 2016).
- Women in the field of marketing have a lower average *h*-index (regardless of the database used) than men. This behavior of productivity indices by gender is repeated in other areas of knowledge and in other countries. Several investigations have confirmed the lower academic productivity of women compared to that of men in countries such as Italy (Filandri and Pasqua, 2021) or Germany (Mayer and Rathmann, 2018). The paper by Bendels *et al.* (2018) examines the role of women in 293,557 research articles in *Nature Index*; it reveals how women are

Table 14. Most cited articles by authors with the highest *h*-index

Researcher	Most cited article (year)	Journal
1. Flavian-Blanco, C.	"The role played by perceived usability, satisfaction and consumer trust on website loyalty" (2006)	*Information and Management*
2. Casaló-Ariño, L.V.	"Influencers on Instagram: Antecedents and consequences of opinion leadership" (2020)	*Journal of Business Research*
3. Liébana-Cabanillas, F. J.	"Antecedents of the adoption of the new mobile payment systems: The moderating effect of age" (2014)	*Computers in Human Behavior*
4. Bigne-Alcañiz, J.E.	"The theme park experience: An analysis of pleasure, arousal and satisfaction" (2005)	*Tourism Management*
5. Muñoz-Leiva, F.	"Antecedents of the adoption of the new mobile payment systems: The moderating effect of age" (2014)	*Computers in Human Behavior*
6. Gil-Saura, I.	"Destination image: Towards a conceptual framework" (2002)	*Annals of Tourism Research*
7. Molinillo-Jiménez, S.	"DMO online platforms: Image and intention to visit" (2018)	*Tourism Management*
8. Rodríguez-Del Bosque, I.A.	"Tourist satisfaction: A cognitive-affective model" (2008)	*Annals of Tourism Research*
9. Saura-Lacárcel, J.R.	"Using Data Sciences in Digital Marketing: Framework, methods, and performance metrics" (2021)	*Journal of Innovation & Knowledge*
10. Belanche-Gracia, D.	"Service robot implementation: a theoretical framework and research agenda" (2020)	*Service Industries Journal*
11. Andreu-Simo, M.L.	"The theme park experience: an analysis of pleasure, arousal and satisfaction" (2005)	*Tourism Management*
12. Frías-Jamilena, D.M.	"Internet vs. travel agencies on pre-visit destination image formation: An information processing view" (2007)	*Tourism Management*

underrepresented in the authorship of these studies, and this disparity increases as the impact of the journal becomes more significant. However, it is striking that, in Spain, according to the latest data from the Organization for Economic Cooperation and Development (OECD), women present an academic performance equal to or superior to men (OECD, 2024). However, the results of our research confirm that in the academic career, the situation is reversed. This phenomenon may be related to the differences in gender roles that are accentuated at this stage of life. In our opinion, one of the main reasons is that women continue to carry a greater weight in raising children. This is recently confirmed by the work of Ceci *et al.* (2023) when pointing out that one of the reasons that justifies the greater scientific production and the higher productivity indicators in men is the marked stagnation that occurs in the scientific production of women when they have children; this stagnation even amounts to periods of five years without publishing. Our results seem to confirm this aspect, also in women who work in the field of marketing in Spain.

- There is a direct relationship between academic ranking and the three *h-indexes*. This is a logical behavior that shows *h*-index increasing as the researcher's academic rank increases. It is motivated by the greater volume of scientific production (and citation) that implies the achievement of figures of greater stability and category. However, there are two notable aspects: the first, that full professor has an average *h*-index (*WoS)* that is more than double that of associate professor (15.52 and 7.92, respectively). The second, the similarity of the average *h-index (WoS)* between the figures of contracted assistant professor (4.55) and non-contracted assistant professor (3.62), despite the higher academic level that is assumed for the former. What is clear is the important difference between permanent and non-permanent teaching staff.
- Regarding universities, Cantabria, Lleida, Zaragoza, Granada, Valencia, CastilleLa Manc ha and Pablo de Olavide are, in this order, the seven universities with the highest average *h*-index. This order is repeated, both for the *WoS h*-index and for the *Scopus h*-index, with a slight change in the sixth and seventh positions, which are reversed in Scopus. The difference between both databases is found in the universities ranked in top ten. Thus, while in the case of the WoS *h*-index, it is the Jaume I University of Castellón, the University of Huelva and the University of Las Palmas de Gran Canaria that occupy the last three positions, in the case of the Scopus *h*-index, it is the University of Extremadura, the University of Murcia and Jaume I University, in that order, that complete the "podium." It should be noted that the universities included in top ten are also those that have the biggest number of full professors and associate professors, which, to a certain extent, seems reasonable. However, there are two exceptions that need to be noted. The first is the University of Lleida, which with only three aggregated professors (a contractual figure that is assimilated, in the rest of Spanish regions to the associate professor) is the Spanish public university with the second highest average *h*-index in *WoS* (15.67) (also in *Scopus)*. The second exception is the University of Huelva, which, with two professors holding the position of contacted assistant professor and associate professor, is ranked ninth with an average *WoS h*-index of 11.00. On the contrary, universities with a significant number of stable professors (both full professors and associate professors), such as King Juan Carlos University, the University of Seville, Málaga, Basque Country or the Autonomous University of Madrid, are outside the top ten rank based on average *h*-index.

- In terms of regions, Cantabria is the one with the highest average *h*-index (*WoS)* (16.11). They are followed by Aragón, Castille-La Mancha, Valencia and Murcia Region. It should be noted that, from all these five regions, Cantabria and Aragón only have one public university. Their average *WoS h*-index, above the average (8.63), places them among the top five regions. On the contrary, regions such as Andalusia or the Community of Madrid, which are those with the largest number of teaching and research staff, 126 and 79 respectively, are not included into those regions that have a higher *h*-index.
- The results show that the values on the average *h*-index when there is an individual marketing department are significantly higher than when the marketing field is part of a more general department with other (often business-related) fields of knowledge. This trend is similar in the three *h*-indexes analyzed and shows that the research capacity is higher when the marketing faculty is organized in its own autonomous department. Universities with a lower research budget have, on average, a higher *h*-index (8.90 *vs* 8.36). This result seems surprising, because it would be expected that universities with a larger budget would have a higher *h*-index on average, given the greater resources available. Our results seem to confirm the opinion of some authors who suggest that funding is not always related to greater scientific production (Lawson *et al.*, 2021).
- Regarding the aspects that can explain the *h*-index (WoS), the regression analysis has shown that the academic rank of the researcher, the existence or not of a marketing department and gender, in that order, are the variables with the greatest influence when it comes to explaining the researcher's ability PDI researcher. Contrary to expectations, our results suggest that the research budget available to each faculty member does not significantly influence his or her research capacity. If we further analyze the regression analysis developed in each of the two groups of universities (high *vs* low research budget per faculty member), it is interesting to observe how the existence or absence of a marketing department is an aspect that significantly explains the *h*-index in the universities with the highest level of research resources. By contrast, it is an almost irrelevant aspect in those universities with low research resources. Nevertheless, the importance of having or not having an autonomous and independent department is evident in the significance for the sample as a whole. Differences are also observed with respect to gender, being a variable of moderate influence in universities with fewer resources per researcher and irrelevant in universities with a larger budget per researcher. The element common to both groups that explains the *h*-index is academic rank.
- Finally, it should be noted that full professor Carlos Flavián-Blanco is ranked, by far, first in terms of number of citations of his works. This result is in line with the fact that professor Flavián-Blanco has become the first Spanish researcher in the marketing field to be included among the most cited researchers internationally according to the *highly list cited researchers* of 2023 [8].

6. Conclusions

Answering the question included as the title of this work, we can consider that a researcher in the field of marketing in Spain has a high *h*-index starting with a figure of 8 (*WoS*), 10 (*Scopus*) or 17 (*Google Scholar*), respectively. However, if we want to be more precise, the consideration of a high *h*-index (at least higher than the national average) will depend on the

academic rank of the researcher; thus, while for a non-contracted assistant professor, an *h*-index of 4 (*WoS*) can already be considered high, a full professor will need an *h*-index of at least 15 (*WoS*) to be able to affirm the same. Given the significance of the academic rank when it comes to explaining the value of the *h*-index of any researcher, we understand that looking at the said academic rank when comparing research capacity is completely justified.

6.1 Theoretical implications

- This research contributes to the understanding of the factors that influence a researcher's *h*-index. Contrary to expectations, no significant relationship is found between the budget per researcher and scientific productivity as measured by the *h*-index. This research shows that, in the field of marketing research in the Spanish context, other factors such as academic rank, the existence of a dedicated marketing department, or gender, have a greater influence on the research capacity of academic staff.
- The results of the study show that the three most commonly used *h*-indexes (*WoS*, *Scopus* and *Google Scholar*) present a similar trend when evaluating scientific production. This finding adds to the literature on the *h*-index as a metric that allows comparison of research capacity within the same area of knowledge.
- The finding that women have a lower *h*-index than men is in line with previous studies in other areas and countries. This adds to the literature on gender differences in scientific productivity and the persistence of gender barriers in academia.

6.2 Practical implications

- The impact of a researcher's academic rank on his or her *h*-index shows a clear relationship between contractual stability and scientific productivity. It is suggested that universities should reconsider academic support and promotion policies, especially for teaching staff in non-tenured categories. The significant difference in the *h*-index between full professors and associate professors highlights the importance of job stability in scientific production. However, the similarity of the *h*-index between hired assistant professors and non-hired assistant professors, despite the higher academic level of the former, highlights the need to review research support mechanisms for personnel in early stages of their career.
- This research shows that the existence of an independent department with its own marketing autonomy favors research capacity. It is suggested that universities consider the creation of a department as an independent organizational structure, thus optimizing resources oriented to scientific production.

6.3 Political implications

- This study shows that a larger budget does not guarantee greater scientific productivity, suggesting that funding policies should go beyond increasing available resources. Policies could also focus on how these resources are managed and distributed to maximize their impact on academic production.
- Finally, the results of the study highlight the need to implement gender equality policies in universities. Responsible institutions should promote equal opportunities that allow women to do research without their careers being affected by motherhood or the unequal distribution of family responsibilities.

7. Limitations and future research

One of the limitations of this research is the rapid obsolescence of the data. However, it is a snapshot of the marketing field at a certain point in time in the Spanish context, and therefore, it is very useful to know the field, to measure its evolution and to serve as a reference for future work. There are also some interesting aspects that future research could contribute, such as the inclusion of private universities and the development of this type of analysis in other fields of knowledge (specially all those related to business) or in other geographical contexts.

Notes

1. For instance, Bi (2023) proposes the h_i index that considers the number of authors in publications by assigning the author of an *m-authored article* a credit of c/m if the article received *c* citations and where the subscript "*i* "refers to *individual contributions.*
2. In 2010, Hirsch proposed the *ħ*-index as the number of articles that have a number of citations greater than or equal to the ħ of the co-authors of each article (Hirsch, 2010). Later, in 2019, he proposed the h_α-index as a measure of a researcher's scientific production that counts only those articles in which the researcher is the main author (Hirsch, 2019).
3. According to Egghe (2006), "a set of articles has a g-index if *g* is the highest rank, so that the *g*-top articles have at least g^2 citations." This index owns the main advantages of the original *h*-index but taking into account the articles that have received a greater number of citations (Egghe, 2006). The *R index*, proposed by Jin Bihui, is defined as the average number of citations received according to those publications included into the *h*-index (Bihui, Liming, Rousseau and Egghe, 2007).
4. We have used the general budget figure for each university given the difficulty in homogenizing the specific research budget figures.
5. Nine out of 46 universities have their own Department of Marketing (Universities of Alicante, Cadiz, Granada, Murcia, Zaragoza and Valencia, Complutense University of Madrid, Autonomous University of Madrid and Pompeu Fabra University).
6. This variable has been considered ordinal, with the following order (from lowest to highest rank): aggregated professor; lecturer; associate professor of university school; non-contracted assistant professor; contracted assistant professor; associate professor; full professor.
7. Researchers are sorted based on their *WoS h*-index. In case of similarity between researchers, the *Scopus h*-index has been used and, in case of similarity again, the *Google Scholar h*-index has been used. Using this rationale, Table 13 shows 12 researchers, given that, from the ninth position, the *h*-index (*WoS)* takes the same value (28).
8. www.aemark.org/index.php/es-es/component/content/article/89-noticias/918-carlos-flavian-blanco-primer-investigador-espanol-en-el-area-de-marketing-and-business-listed-highly-cited-researchers-2023?Itemid=558

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