Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/jptcp.v30i14.6225

FINANCIAL EVALUATION AND EMPLOYABILITY WORLDWIDE: A BIBLIOMETRIC ANALYSIS

Juan Carlos Rios[1], John Buelvas Parra[2*], William Niebles Nuñez[3]

[1]Universidad de Sucre (Colombia)
[2*]Universidad de Sucre (Colombia)
[3]Universidad de Sucre (Colombia)

***Corresponding Author:** John Buelvas Parra
*Universidad de Sucre (Colombia john.buelvas@unisucre.edu.co

ABSTRACT
This research document presents a bibliometric analysis carried out with the objective of identifying global trends in scientific publications on the intersection between financial evaluation and employability. The literature exploration was carried out using the Scopus database, using search strategies such as the use of Boolean operators and synonyms of keywords, recovering a total of 108 research works totally relevant to the area. study. The variables used to carry out the study metrics were downloaded from the metasearch engine in Bibtex format, in order to be compatible with the Bibliometrix package of the R statistical program. The findings state that the annual growth rate between 1980 and 2023 was 3.28 %, with the years 2019 and 2022 being the most productive, with 10 documents produced in each of these. The United States turned out to be the country that has contributed the most in this field, with 56 documents, followed by the United Kingdom with 27 and Colombia with 15. The magazines that have had the most impact in this field are Agricultural Water Management and Energy Conversion and Management. The researcher with the highest H index is Banks J., with an indicator of 3 and the most relevant institutions were the University of Leeds and the University of Medellín in Colombia. Finally, it was concluded that the key terms "Financial assessment" and "Financial valuation" are emerging topics in this field of study and at the moment no relationship is observed with the terms "Employment", "Employ" or "Job".

Keywords: Bibliometric analysis, Literature review, Financial evaluation, Employability, Employment.

RESUMEN
En el presente documento de investigación, se expone un análisis bibliométrico realizado con el objetivo de identificar las tendencias globales de las publicaciones científicas sobre la intersección entre la evaluación financiera y la empleabilidad. La exploración de la literatura se llevó a cabo utilizando la base de datos de Scopus, haciendo uso de estrategias de búsqueda como la utilización de operadores booleanos y de sinónimos de las palabras claves, recuperando un total de 108 trabajos de investigación totalmente relevantes para el área de estudio. Las variables utilizadas para realizar las métricas del estudio fueron descargadas del metabuscador en formato Bibtex, con el fin de que fueran compatibles con el paquete Bibliometrix del programa estadístico R. Los hallazgos encontrados enuncian que la tasa de crecimiento anual entre 1980 y 2023 fue de 3.28%, siendo los años 2019 y 2022 los más productivos, con 10 documentos producidos en cada uno de estos. Estados

Unidos resultó ser el país que más ha aportado en este campo, con 56 documentos, seguido por Reino Unido con 27 y de Colombia con 15. Las revistas que más han impactado en este campo son Agricultural Water Management y Energy Conversion and Management. El investigador con mayor índice H es Banks J., con un indicador de 3 y las instituciones más relevantes fueron University of Leeds y la Universidad de Medellín de Colombia. Finalmente, se concluyó que los términos claves "Financial assessment" y "Financial valuation", son temas emergentes en este campo de estudio y por los momentos no se observa relación con los términos "Employment", "Employ" o "Job".
Palabras claves: Análisis bibliométrico, Revisión de literatura, Evaluación financiera, Empleabilidad, Empleo.

INTRODUCTION

In the current scenario, financial evaluation has become an essential element to comprehend and guide the feasibility and expansion of companies in a closely connected and competitive world. Financial evaluation includes a wide range of tools and models designed to thank and evaluate the financial performance of a business, its capability to produce value, and its proficiency for using resources efficiently (Myšková & Hájek, 2017). From the perspective of a business, it means looking at the profitability, liquidity, solvency, operational efficiency and several other aspects, to make decisions, which are not only informed but also strategic in nature and propel it towards long term success (Türegün, 2022).

The significance of financial evaluation is not limited to business, as its applications are far and wide including the public sector and the social sector. In the public sector, it acts as a key mechanism to manage fiscal resources in the name of public and carrying economic planning at national and international level. In the social sector, it is a tool to evaluate the financial returns of various programs and policies meant to address issues such as poverty, education, and health (Cazenave & Morales, 2021). In a nutshell, Financial Evaluation is a weapon for informed decision-making, which makes its presence felt, impacting the organization as well as society at large (Tsianaka & Dimitra, 2023).

Contrastingly, employability, which pertains to the ability of an individual to acquire and maintain suitable employment, has gained a lot of attention in this era of fast technological change, globalization and the future of work (Fajaryati et al., 2020). In a broad sense, employability does not only concern employment opportunities but also the employability due to adaptability of workforce with changing demands of the labor market requiring different skills and capabilities and demanding the workforce and the human resource (HR) to diversify and stand firmly against fellow beings coming either from within or outside the domicile of their regions or countries (Behle, 2020).

There are various influencing factors on employability from a global perspective, which can include technological developments, government policies, education and training and labor market opportunities, and the overall global demand and supply of suitable workforce. Employability has obtained much importance generally observed and addressed by the governments, the employers and their representatives, and the international organizations, striving to generate an employable and skilled workforce capable of navigating the challenges of the century to ensure more opportunities (Rakowska & de Juana-Espinosa, 2021).

The relationship between financial assessment and global employability may seem distant at first sight. But in fact they are closely intertwined, particularly within a globalized economic environment and dynamic labor market. On one hand, financial assessment is a key factor of corporations' investment and contracting decisions (Grozdić & Demko-Rihter, 2023). It has a considerable impact on job creation and economic development. On the other hand, the employability characteristics of individuals play a significant role in their capability to access job opportunities, contribute to the growth of corporations and the economy, and in enhancing their personal financial capability (Monteiro et al., 2022).

In today's economy, the requirements for skills and competencies that the labor market is looking for are constantly evolving. In this context, financial assessment helps to uncover information about skill areas in which it is reasonable and economically viable to invest and develop capacity further to engender employment, and stimulate sustainable and inclusive economic growth (Nagalakshmi et al.,

2023). Simultaneously, enhancing the employability of the labor force through education, training, and professional development contributes to increasing the productivity and competitiveness of corporations (Jackson & Tomlinson, 2020). This in turn is likely to have a positive effect on financial performance as well as the profitability of corporations, which is essential for their capability to invest and further expand.

In view of the above and recognizing the increasing relevance of both financial assessment and employability in a global context, and in the context of the obvious paucity of research having been conducted in the cross-section of these two areas, it was deemed fitting to take up a comprehensive study through a bibliometric analysis primarily to identify and explore the trends, patterns, and research gaps in this area (Chàfer et al., 2021). A bibliometric analysis enables a synthesis of the existing literature, thereby revealing the most relevant research areas and sources, the primary contributors to the research, and key emerging themes. Moreover, we aim to address areas related to potential streams of future research and to provide lessons for policy makers on enhancing global financial valuation and employability integration (Ramírez-Durán et al., 2023).

There is a need to construct a solid foundation of literature for global financial assessment and employability intersection investigation in the future. The examination of these dimensions is paramount to enhancing understanding of the intersection of financial valuation and employability globally and contributes to shaping policy design and practice in the field. It reveals research directions, research hotspots and new research prospects, as well as research deficiencies, which can effectively guide the academic and practical research of relevant subjects and promote the setting of public policies and enterprise development strategies in future (Li et al., 2021). This paper also plays a positive role in promoting the integration of financial valuation and employability, better enhancing the employability capacity of the talents, and promoting sustainable economic growth globally.

MATERIALS AND METHODS

The present work is a descriptive and retrospective study, structured based on a bibliometric analysis with the objective of identifying global trends in scientific publications related to the intersection between financial evaluation and employability on a global scale. According to several authors, bibliometric analyzes offer markers to detect quantitative trends associated with the development of an academic area. Through this type of analysis, it is feasible to determine the intellectual activity between authors, institutions and nations through the use of statistical approaches, assuming the examination of the evolution of a field and the determination of its theoretical foundations (Ramírez et al., 2023).

To develop the aforementioned analysis, the following search equation was used: (TITLE-ABS-KEY ("Financial valuation") OR TITLE-ABS-KEY ("Financial assessment") AND TITLE-ABS-KEY (employment) OR TITLE-ABS-KEY (job) OR TITLE-ABS-KEY (work) OR TITLE-ABS-KEY (employ)). Search strategies were implemented with keywords, Boolean operators and the use of filters, with the aim of obtaining the best results, 108 documents were recovered in all languages in the time period between 1980 and 2023.

Using Excel statistical tools and the Bibliometrix package of the R statistical program, the file downloaded from Scopus was processed and tables and graphs were created on the total number of publications, percentage of publications by journal, country, institutions, most cited articles, types of documents, impact factor and for bibliometric mapping analysis.

RESULTS

Figure 1. *Central information*

Figure 1 presents the central information resulting from the exploration carried out in the Scopus metasearch engine on the research topic "Financial evaluation and employability worldwide" in the period from 1980 to the present, yielding the following results: in total there were 108 research works found , which have an annual growth rate of 3.28%, average citations per document of 17.53, single-author documents were 16 and number of authors per document 3.28, with respect to international co-authorship it was 12.96%.

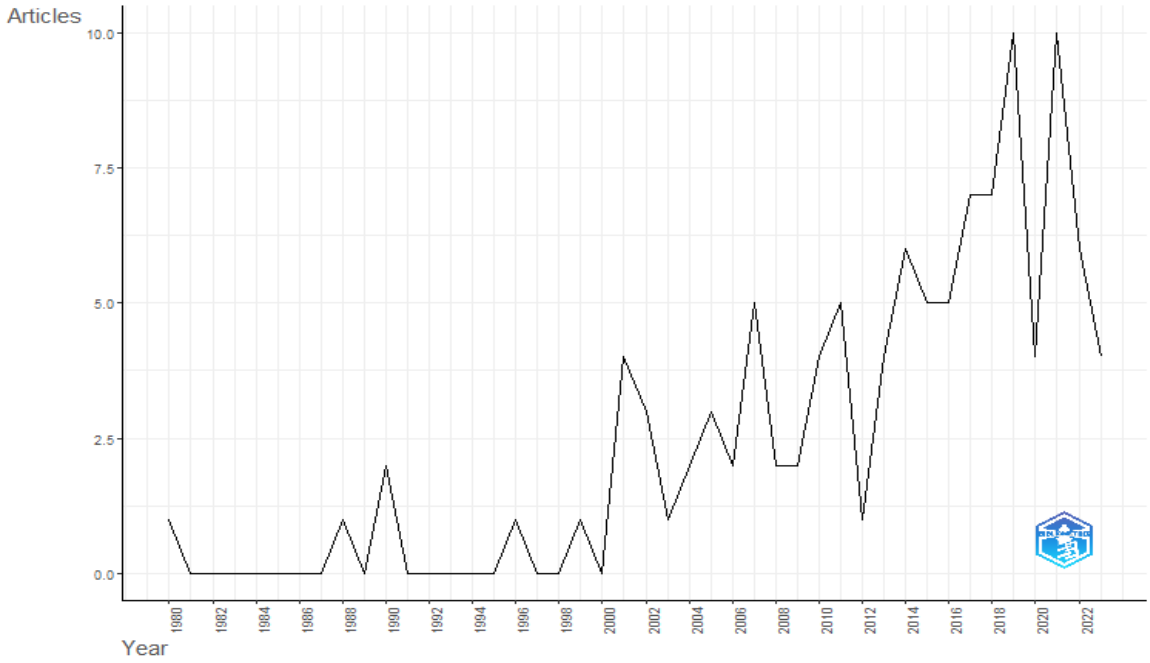

Figure 2. *Annual productivity*

The annual production shown in figure 2 with respect to the research topic "Financial evaluation and employability worldwide" shows a pronounced growth between the years from 2000 to 2022, with greater interest from researchers being noted in the years 2019 and 2021, these two being the ones with the highest production with 10 jobs carried out in each of them.

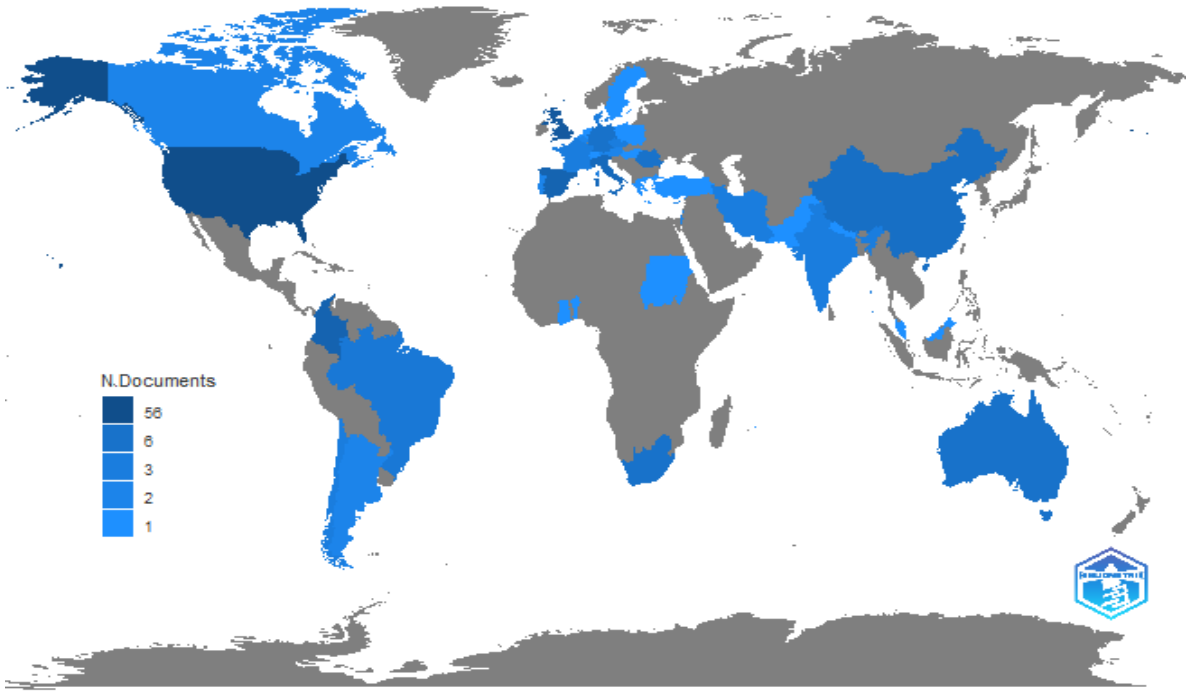

Figure 3. *Productivity by country*

The country that contributes the most to the research topic is the United States, as seen in Figure 3, with a contribution to the field of study of 56 research works, followed by the United Kingdom, with 27, and Colombia, with 15. Some of the most relevant research produced in the largest contributing country, the United States, argues that water managers must constantly balance investment in infrastructure improvements to ensure a reliable water supply at affordable water rates for consumers. As a result, the same research states, trade-offs between water supply and financial objectives have become critical to the long-term sustainability of utility operations. However, the cited study continues, little research has directly quantified the financial benchmarks relevant to decision-making on water supply system adaptation (Gorelick, Gold, & Asefa, 2023).

According to the authors mentioned above, benchmarks encompass debt covenants, which are regulations imposed by creditors seeking guarantees for debt repayment. Failure to meet covenant thresholds can result in a downgrade of a utility's credit rating, elevated interest rates on subsequent debt, and increased expenses for new infrastructure. The same article offers an experimental modeling methodology that carefully combines financial modeling with adaptive water supply planning to better track how utility budget decision-making can adapt to future population growth and water construction. infrastructure. This is illustrated through an assessment of Tampa Bay Water's (TBW) infrastructure planning, the results of which quantify the financial effects of decisions made regarding infrastructure planning and the growth of water rates and agreements. bonds, and illustrate TBW's budget adaptation in response to increased water demand and supply expansion (Gorelick, Gold, & Asefa, 2023).

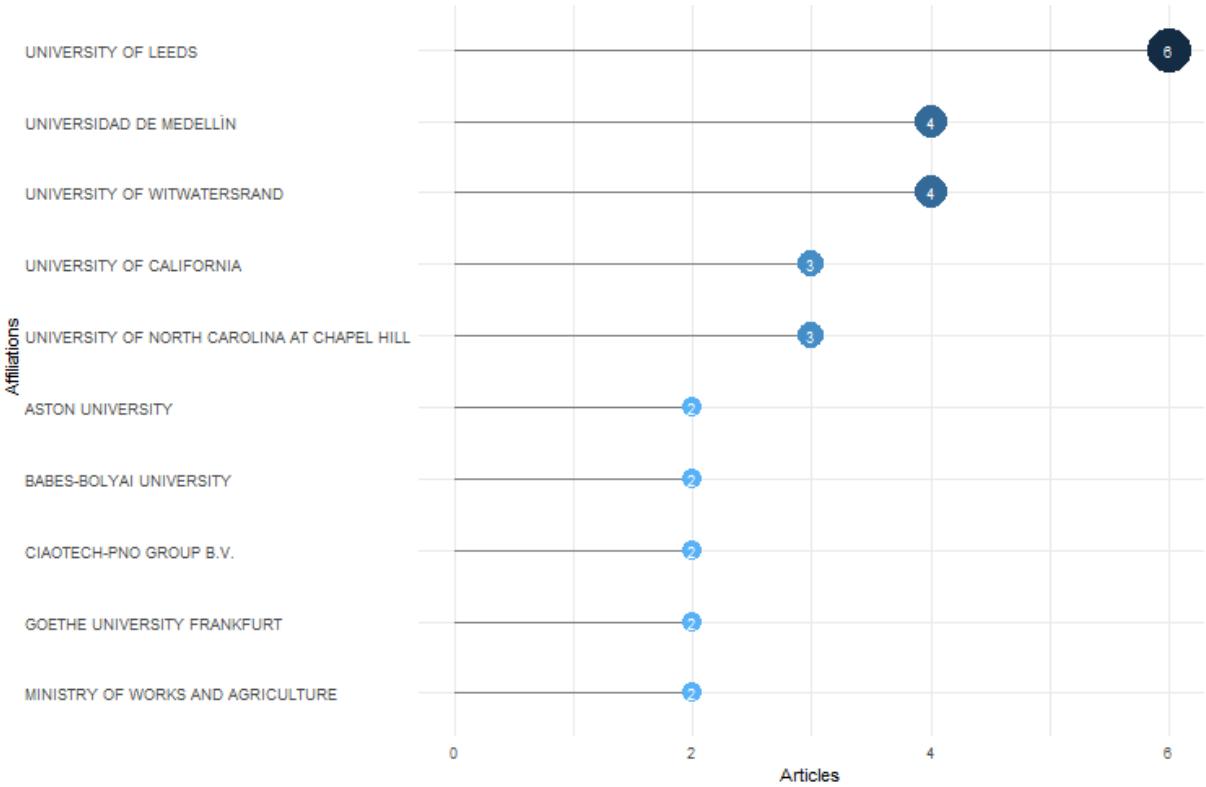

Figure 4. *Productivity by institutions*

The University of Leeds, as seen in Figure 4, is the institution that has made the most contributions to the research field with 6 documents, followed by the University of Medellín and the University of Witwatersrand with 4 works each. From the first institution, the work of Allen (2017) stands out, where a boundary layer scaling (BLS) method was developed to predict the average near-surface wind speed and long-term power densities. As the author explains, the applied technique was based on the scale of reference climatological data, either from long-term average wind maps or hourly wind speeds produced from numerical weather prediction models (NWP) high resolution. Projected

wind speeds and energy densities were verified with observed wind speeds at 124 sites in Great Britain. The researcher used more complete modeling of the surface aerodynamics than the previous studies he mentioned. According to the same author, the BLS model could improve the NOABL (Numerical Objective Analysis of Boundary Layer) by predicting the long-term mean wind speed with an average percentage error of 1.5% using wind map data collected from of long-term observational data.

However, the results obtained in the referred research indicated that the boundary layer scale of the NWP data could not improve the use of raw NWP data for near-surface wind speed predictions. Despite this, the authors thought that using BLS-scale PNT data instead of reference data sets could result in more accurate power density forecasts. The author states that the power density forecasts were achieved with a mean percentage error of 1% using a vertical scaling factor in the form of a Weibull distribution fitted to the BLS PNT data. This was a major improvement over using a set form factor, which is required when reference wind maps are the only source of long-term mean wind speeds. As a result, the researcher draws conclusions from the work that demonstrate the benefits of using a BLS model for wind speed and NWP data for power density predictions for small and medium scale wind energy resource assessments. These benefits, the aforementioned research concludes, could lead to greater annual energy production and more affordable evaluations of the prospects for the installation of small and medium-scale wind turbines (Allen, 2017).

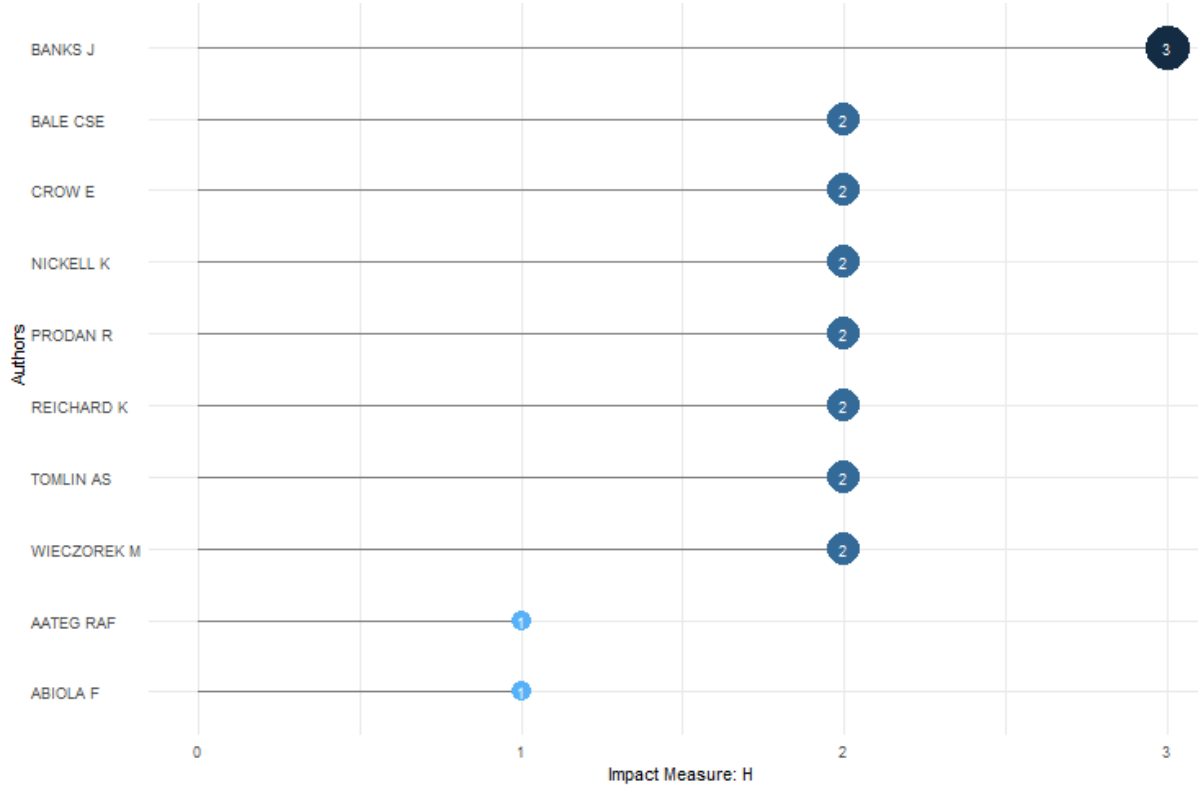

Figure 5. *H. index by authors*

In Figure 5 you can see the top 10 authors with the highest H index on the topic of study, of which the researcher Banks J. stands out, with an indicator of 3, one of his researches is highlighted by this author in the co-author, which indicates that healthcare forecasting and management (PIIM) technology professionals already know that PHM can offer the ability to efficiently manage the maintenance and logistical support of one or multiple assets by having Regular updates available with complete health data. As you might expect, potential users of PHM technology want to know how adopting PHM would help their business, according to the authors. The study explains the common response from professionals in the field, which is that anecdotal evidence suggests that PHM reduces maintenance costs, increases operational availability, and improves safety. The authors of the same

work clarify that while this information helps the potential customer understand the practical benefits of the technology, the customer still needs additional information to support their investment in the technology. To do this, the client requires a return on investment (ROT) calculated for their specific asset, which provides a financial evaluation of the benefit of the investment.

The aforementioned research reveals that a typical engineer lacking financial analysis skills may find it daunting to conduct a comprehensive cost-benefit analysis due to the amount of data, time, and expertise required. The reality is, the authors say, with a superficial understanding of asset operation, maintenance and logistics issues, engineers without business school training can perform useful cost-benefit analysis. The authors state that the above explanations are intended to serve as a general technique for conducting a preliminary cost-benefit analysis to determine a ROT for PHM deployment. In summary, the work presented covers the general types of data needed for analysis, quantification of expected benefits, the types of supporting data needed to verify benefit assumptions, and a methodology for calculating PHM technology prices (Banks, Reichard, Crow, & Nickell, 2009).

Table 1 *Magazines with the most impact*

Sources	h_index	g_index	m_index	TC	NP	PY_start
AGRICULTURAL WATER MANAGEMENT	2	2	0,286	31	2	2017
ENERGY CONVERSION AND MANAGEMENT	2	2	0,286	73	2	2017
2007 PROCEEDINGS - ANNUAL RELIABILITY AND MAINTAINABILITY SYMPOSIUM, RAMS	1	1	0,059	46	1	2007
2008 SC - INTERNATIONAL CONFERENCE FOR HIGH PERFORMANCE COMPUTING	1	1	0,063	8	1	2008
ACCOUNTING FORUM	1	1	0,167	14	1	2018
AMERICA LATINA EN LA HISTORIA ECONOMICA	1	1	0,167	2	1	2018
AMERICAN FAMILY PHYSICIAN	1	1	0,023	3	1	1980
AMFITEATRU ECONOMIC	1	1	0,111	4	1	2015
APPLIED ENERGY	1	1	0,143	63	1	2017
APPLIED HEALTH ECONOMICS AND HEALTH POLICY	1	1	0,05	7	1	2004

Source: author based on information from Scopus

The magazine with the greatest impact on the topic of financial evaluation in intersection with employability worldwide was Agricultural Water Management, with an indicator of 2, as evidenced in table 1, followed by Energy Conversion and Management, also with 2. From the most influential magazine, Agricultural Water Management, a work stands out where a pilot equipment (Aquemfree) was developed and tested for the remediation and reuse of agricultural wastewater with pesticides derived from the remnants, cleaning and rinsing of equipment and phytosanitary packaging, through a photocatalytic process using TiO2/Na2S2O8 and sunlight. This mentioned article aimed to evaluate the economic viability of the Aquemfree system by examining four experimental devices on typical Mediterranean agricultural farms and their effects on crop cost structures. Two cases were established per farm: pilot devices equipped with a 200 L (Aquemfree 200) or 400 L (Aquemfree 400) reaction tank.

According to what was explained by the authors, the degradation rate of pesticides ranged between 82.4% and 97.8%. In terms of economic value, the high importance of fixed costs (81%) suggests a faster payback for higher frequencies of use, the maximization of which depends on the radiation threshold of 30 annual cycles. According to the research, financial measures related to equipment capacity provide a 31% cost reduction for the largest device, confirming economies of scale. The impact of using the method, on the other hand, suggests a modest increase in crop production costs (0.24-0.05%), with lower values correlated with crops with higher production costs, the researchers note. The study concludes by saying that an Aquemfree 200 device has a very wide potential agricultural application area (160 ha for trees and 53-63.6 ha for greenhouses), and an Aquemfree 400 device doubles that area (Contreras, Garrido, & Hellín, 2021).

Table 2 *Most cited documents*

Documents	DOI	Cites
KING AA, 2001, J IND ECOL	10.1162/10881980175335852 6	681
REMONDO J, 2008, GEOMORPHOLOGY	10.1016/j.geomorph.2006.10. 041	126
FULMER IS, 2014, J MANAGE	10.1177/0149206313511271	97
HANNAN MT, 2006, IND CORP CHANGE	10.1093/icc/dtl020	86
PRODAN R, 2011, J GRID COMPUT	10.1007/s10723-011-9196-x	64
ALLEN DJ, 2017, APPL ENERGY	10.1016/j.apenergy.2017.09.0 29	63
BANKS J, 2007, PROC ANNU RELIAB MAINTAINABILITY SYMP	10.1109/RAMS.2007.328097	46
ACHICHE S, 2013, RES ENG DES	10.1007/s00163-012-0130-4	43
BAUER HH, 2005, MANAGE DECIS	10.1108/00251740510589733	40
BELLOS E, 2018, ENERGY CONVERS MANAGE	10.1016/j.enconman.2018.06. 076	38

Source: author based on information from Scopus

Table 2 shows the top 10 research papers with the most citations on the topic of study, of which the document by King Andrew A. and Lenox, Michael J., from 2001 published in the Journal of Industrial Ecology stands out. 681 citations. This work shows that companies with high environmental performance tend to be profitable, but doubts persist about the nature of the relationship. The author asks whether it is worth having clean facilities or having facilities in relatively clean industries, and whether better environmental performance actually results in better financial performance or whether the observed relationship is a product of some other underlying attribute of the company. To investigate this research, the same study examined 652 American manufacturing companies between 1987 and 1996. The aforementioned study found evidence of a relationship between pollution reduction and higher financial valuation, but also found that fixed qualities and position strategy of a company could influence this relationship. Hence, the question of “When does it pay to be green?” may be more crucial than "Is going green worth it?" according to the results of the researchers (King y Lenox, 2001).

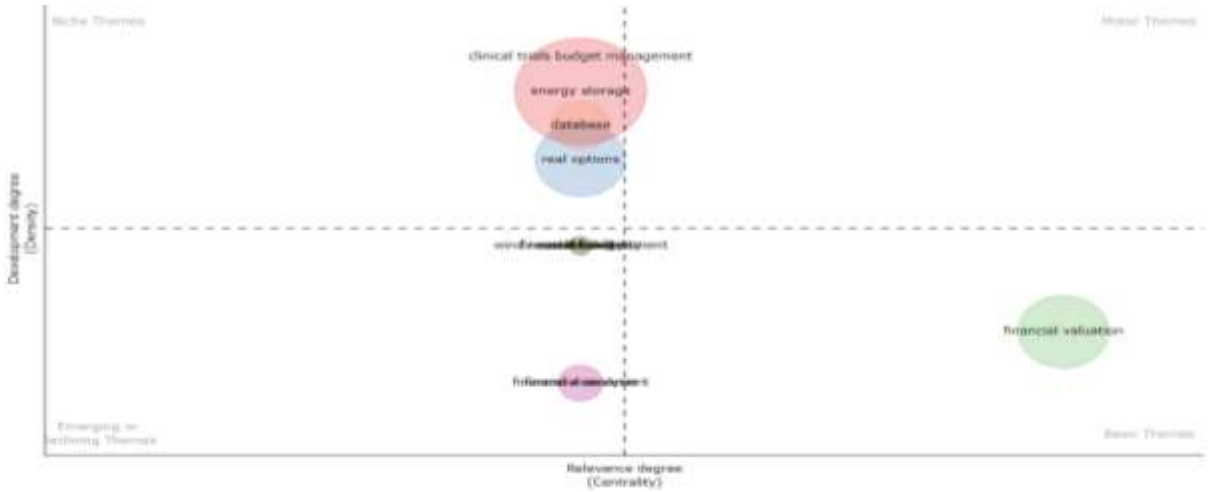

Figure 6. *Thematic map*

The simple hubs algorithm, one of the best known in the literature and used for co-word analysis, is used to group keywords into thematic networks based on the frequency with which they appear together. Furthermore, this approach produces clusters labeled with the label of the most central node; That is, the most relevant tag in the keyword group organizes the other tags according to their relevance and links. Once the bibliometric co-word network is completed, the similarity between the

detected keywords and their co-occurrence in the collection of publications is calculated. Consequently, a collection of keyword groups and their relationships is found; These groups are called subjects and are classified into four groups according to Callon centrality and density (López-Robles & Guallar, 2019).

- Motor themes (Q1, upper right quadrant): they are significant and well-developed themes for the organizational framework of the field;
- Peripheral topics (Q2, upper left quadrant): they have strong internal connections but weak external connections, which means that they only contribute in part to the advancement of science;
- New or declining themes (T3, lower left quadrant): both are modest and underdeveloped;
- Basic and transversal themes (Q4, lower left quadrant): they are not developed, but they are significant for a study topic.

Taking into account the above and as presented in Figure 6, there are no driving or main themes of the research field "Financial evaluation and employability worldwide".

Those related to: "Clinical trials budget management", "Energy storage", "Database" and "Real options" are observed as peripheral topics. Among the emerging themes are terms such as: "Wind resource assessment" and "Financial assessment". Finally, as a basic and transversal theme we find the term "Financial valuation". This indicates that in the bibliometric analysis carried out on the study topic "Financial evaluation and employability worldwide", the terms and words found do not have a strong relationship and it is also interpreted that it is a homogeneous topic, because the term is also found in quadrant Q4 which means that it is a transversal topic with other fronts or lines of research, that is, it can be interpreted that the documents found regarding this topic do not have a strong relationship, which also indicates that it is a poorly researched topic.

Co-citation analysis

The idea behind co-citation analysis is that, at least from the point of view of the citing researcher, there is a thematic similarity between two or more articles that are co-cited (cited together) in a third and subsequent documents; the more often they are cited together, the stronger the affinity between them. Therefore, the number of cited articles that include the pair of identical documents in their references indicates the strength of this link. Co-citation patterns could be used to determine and illustrate connections between major ideas in a field if highly cited publications are believed to reflect the essential theories, procedures, or experiments (Miguel, Moya-Anegón, & Herrero-Solana, 2007).

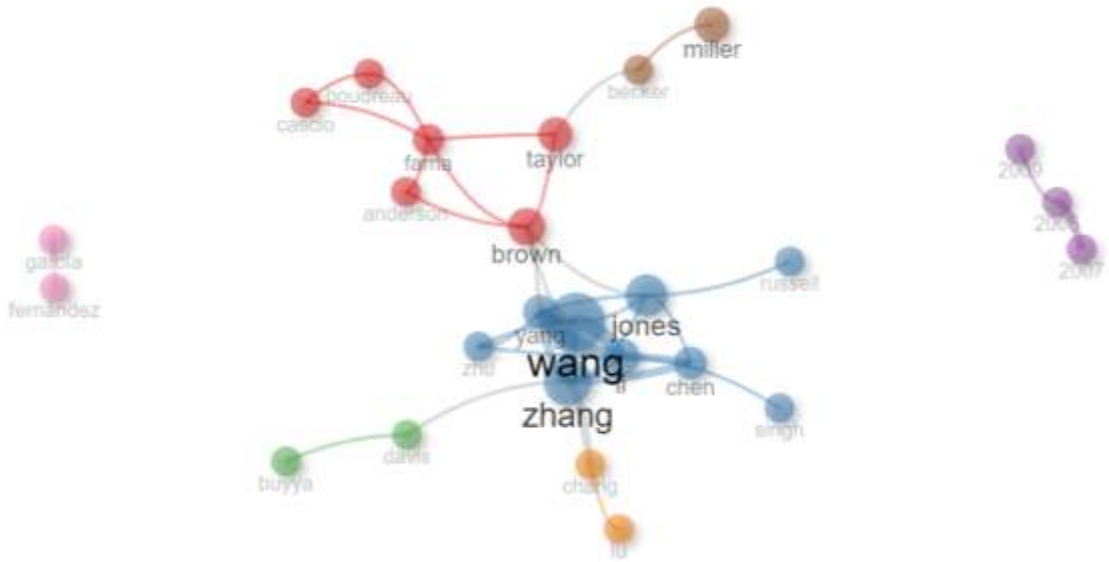

Figure 7. *Co-citation authors*

The authors with equality in the topic they study are presented in figure 7, where seven clusters are observed, formed as follows:
Red cluster: Brown, Taylor, Anderson, Boudreau, Cascio y Fama.
Green cluster: Davis y Buyya.
Blue cluster: Wang, Zhang, Li, Jones, Chen, Zhu, Singh, Russell y Yang.
Brown cluster: Becker y Miller.
Pink cluster: García y Fernández.
Orange cluster: Chang y Lu.

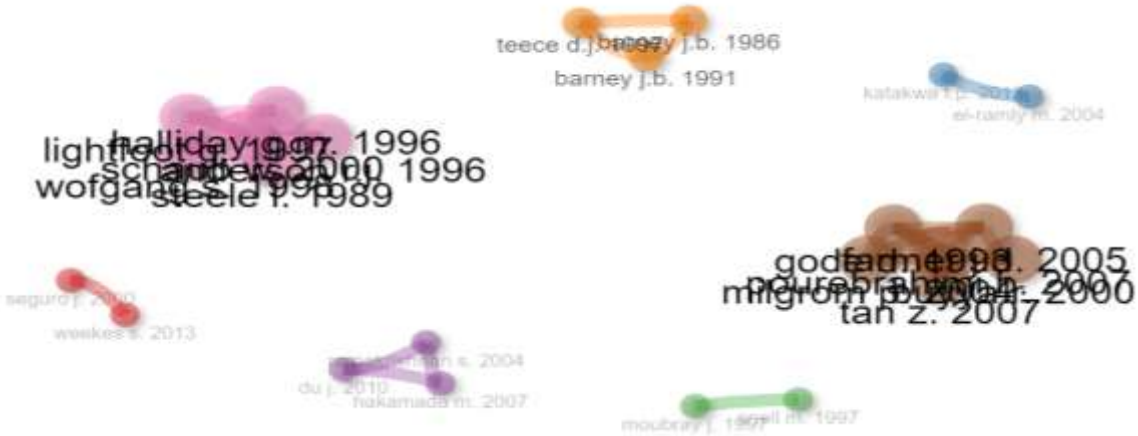

Figure 8. *Co-citation articles*

The research works with thematic similarity are shown in figure 8, 7 clusters were formed as follows:
Red cluster: Seguro J. 2000 y Weekes S. 2013.
Green cluster: Snell M. 1997 y Moubray J. 1997
Pink cluster: Anderson R.J. 1996, Halliday G.M. 1996, Lightfoot G. 1997, Schaub W. 2000, Steele L. 1989 y Wofgang S. 1998.
Brown cluster: Buyya R. 2000, Farmer J.D. 2005, Gode D. 1993, Milgrom P. 2004, Pourebrahimi B. 2007 y Tan Z. 2007.
Purple cluster: Du J. 2010, Hakamada M. 2007 y Ramakrishnan S. 2004.
Blue cluster: El-Ramly M. 2004 y Katakwa t.p. 2013.
Orange cluster: Barney J.B. 1991, Barney J.B. 1986 y Teece D.J. 1997.

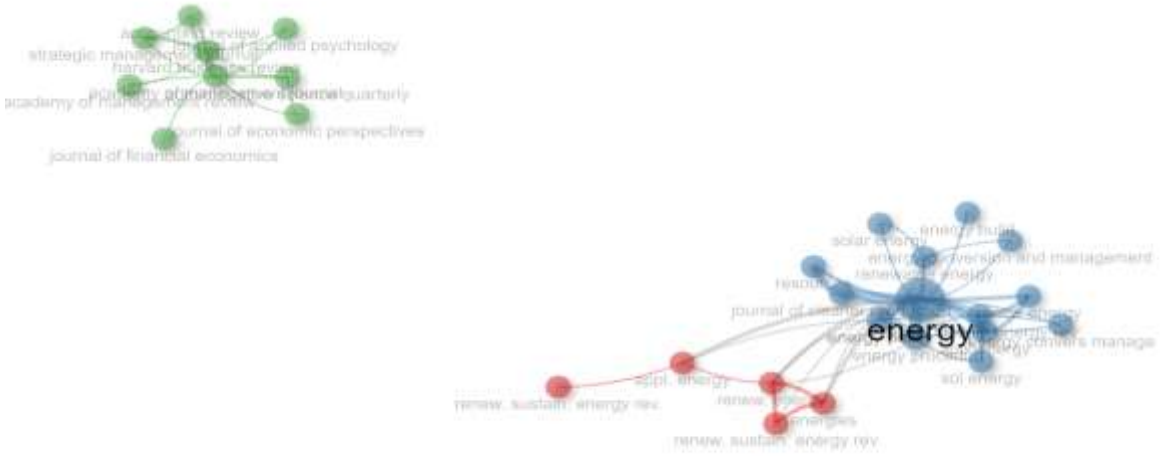

Figure 9. *Co-citation of sources*

In figure 9, the magazines with thematic similarity are presented; three clusters can be seen formed as follows:

Red cluster: Renew. Energy, Energies, Renew. sustain. energy rev y appl. energy.

Green cluster: Journal of economic perspectives, Academy of management journal, Strategic management journal, Academy of management review, Administrative science quarterly, Accounting review, Harvard business review, Journal of financial economics y Journal of applied psychology.

Blue cluster: Energy, Appl energy, Energy conversion and management, Renew sustain energy rev, Solar energy, Energy policy, Energy convers manage, Renew energy, Renewable energy, Journal of cleaner production, Energy build, Energy procedia y Resources.

CONCLUSIONS

Once the review of the literature applied to the thematic intersection of financial evaluation and employability worldwide has been completed, it can be concluded that it is a little explored topic, with the United States being the country that has contributed the most in this field, with 56 documents, followed by the United Kingdom with 27 and Colombia with 15. Another additional argument to this postulate was provided by the study of key words and terms such as the one shown in the thematic map previously.

Based on the results obtained, it is determined that the works found, for the most part, are not relevant to the study variables, which strengthens the argument that the global intersection between financial evaluation and employability is a little explored topic, which can be seen in the fact that the key terms "Financial assessment" and "Financial valuation" were classified as emerging and basic themes in this study, with no obvious relationship observed with the terms "Employment", "Employ" or "Job". Finally, the descriptive part of this work has shown that the author and the one that has the most impact on the study of the thematic intersection of financial evaluation and employability worldwide has been Banks J., the most influential journals have been Agricultural Water Management and Energy Conversion and Management and, finally, the most relevant institutions have been the University of Leeds and the University of Medellín in Colombia.

The revelations brought by this bibliometric study notwithstanding, there is still a lot left to be explored regarding the intersection of employability and financial assessment at a global level. Subsequent research should focus on identifying why there are so few studies in this domain alongside creating strong conceptual models that integrate employability with finance related theories. It would also be beneficial to consider how worldwide economic shifts such as automation and digitalization affect skills demand as well as financial evaluation procedures across different sectors and geographical locations.

Moreover, investigation should be carried out through practice on what effect does corporate monetary selection have on employee's job opportunities and how business techniques and state laws can be able to upgrade global occupation. This area of study might enable companies to make plans that support fair and sustainable economic growth while allowing people to grab chances and face challenges in a world characterized by rapid changes in labor requirements through equipping them for the same with the help of governments.

REFERENCES

1. Achiche, S., Appio, F.P., McAloone, T.C. *et al.* Fuzzy decision support for tools selection in the core front end activities of new product development. *Res Eng Design, 24*, 1–18 (2013). https://doi.org/10.1007/s00163-012-0130-4
2. Adam, K., Hoolohan, V., Gooding, J., Knowland, T., Bale, C. S., & Tomlin, A. S. (2016). Methodologies for city-scale assessment of renewable energy generation potential to inform strategic energy infrastructure investment. *Cities, 54*, 45-56. https://doi.org/10.1016/j.cities.2015.10.015
3. Allen, D. J., Tomlin, A. S., Bale, C. S. E., Skea, A., Vosper, S., & Gallani, M. L. (2017). A boundary layer scaling technique for estimating near-surface wind energy using numerical

weather prediction and wind map data. *Applied energy, 208*, 1246-1257. https://doi.org/10.1016/j.apenergy.2017.09.029
4. Banks, J., & Merenich, J. (2007, January). Cost benefit analysis for asset health management technology. In *2007 annual reliability and maintainability symposium* (pp. 95-100). IEEE. https://doi.org/10.1109/rams.2007.328097
5. Banks, J., Reichard, K., Crow, E. y Nickell, E. (2005). How engineers can conduct cost-benefit analysis for PHM systems. *2005 IEEE Aerospace Conference*. https://doi.org/10.1109/aero.2005.1559701
6. Banks, J., Reichard, K., Crow, E. y Nickell, K. (2009). How engineers can conduct cost-benefit analysis for PHM systems. *IEEE Aerospace and Electronic Systems Magazine*, *24*(3), 22–30. https://doi.org/10.1109/maes.2009.4811085
7. Bauer, H. H., & Hammerschmidt, M. (2005). Customer-based corporate valuation: Integrating the concepts of customer equity and shareholder value. *Management Decision*, *43*(3), 331-348. https://doi.org/10.1108/00251740510589733
8. Bayraktar, E., & Young, V. R. (2007). Hedging life insurance with pure endowments. *Insurance: Mathematics and Economics*, *40*(3), 435-444. https://doi.org/10.1016/j.insmatheco.2006.07.002
9. Becerra, M., Morán, J., Jerez, A., Cepeda, F., & Valenzuela, M. (2017). Wind energy potential in Chile: Assessment of a small scale wind farm for residential clients. *Energy Conversion and Management, 140*, 71–90. https://doi.org/10.1016/j.enconman.2017.02.062
10. Behle, H. (2020). Students' and graduates' employability. A framework to classify and measure employability gain. *Policy reviews in higher education*, *4*(1), 105-130. https://doi.org/10.1080/23322969.2020.1712662
11. Bellos, E., & Tzivanidis, C. (2018). Assessment of linear solar concentrating technologies for Greek climate. *Energy conversion and management*, *171*, 1502-1513. https://doi.org/10.1016/j.enconman.2018.06.076
12. Botero, S., Isaza, F., & Valencia, A. (2010). Evaluation of methodologies for remunerating wind power's reliability in Colombia. *Renewable and Sustainable Energy Reviews*, *14*(7), 2049-2058. https://doi.org/10.1016/j.rser.2010.02.005
13. Bradley, G. (2003). Administrative Justice and Charging for Long-term Care. *British Journal of Social Work, 33*(5), 641-657. https://doi.org/10.1093/bjsw/33.5.641
14. Burnley, S., & Coleman, T. (2018). The environmental and financial benefits of recovering plastics from residual municipal waste before energy recovery. *Waste management*, *79*, 79-86. https://doi.org/10.1016/j.wasman.2018.07.034
15. Castellani, Ana Gabriela, & Iramain, Lucas Daniel. (2018). El deterioro del Estado empresario: transformaciones estructurales y desempeño de las empresas públicas argentinas (1976-1983). *América Latina en la historia económica*, *25*(2), 239-271. https://doi.org/10.18232/alhe.v25i1.866
16. Cazenave, B., & Morales, J. (2021). NGO responses to financial evaluation: auditability, purification and performance. *Accounting, Auditing & Accountability Journal, 34*(4), 731-756. https://doi.org/10.1108/AAAJ-01-2020-4397
17. Chàfer, M., Cabeza, L. F., Pisello, A. L., Tan, C. L., & Wong, N. H. (2021). Trends and gaps in global research of greenery systems through a bibliometric analysis. *Sustainable Cities and Society*, *65*, 102608. https://doi.org/10.1016/j.scs.2020.102608
18. Contreras, F., Garrido, I., Hellín, P., Flores, P., García, J., Navarro-Pay, N., ... & Fenoll, J. (2021). Financial assessment of an in-farm remediation system for the reuse of agro-wastewater with pesticides. *Agricultural Water Management*, *256*, 107087. https://doi.org/10.1016/j.agwat.2021.107087
19. Cuckston, T. (2018, September). Creating financial value for tropical forests by disentangling people from nature. In *Accounting Forum* (Vol. 42, No. 3, pp. 219-234). No longer published by Elsevier. https://doi.org/10.1016/j.accfor.2018.07.001
20. Egea, G., Fernández, J. E., & Alcon, F. (2017). Financial assessment of adopting irrigation technology for plant-based regulated deficit irrigation scheduling in super high-density olive

orchards. *Agricultural Water Management, 187,* 47-56. https://doi.org/10.1016/j.agwat.2017.03.008
21. Fajaryati, N., Budiyono, Akhyar, M., & Wiranto. (2020). The employability skills needed to face the demands of work in the future: Systematic literature reviews. *Open Engineering, 10*(1), 595-603. https://doi.org/10.1515/eng-2020-0072
22. Ferrari, F. (2020). Investigating Inner Dynamics in Family Firms: A Multilevel Analysis. In *Competitiveness, Organizational Management, and Governance in Family Firms* (pp. 330-355). IGI Global. https://doi.org/10.4018/978-1-7998-1655-3.ch014
23. Fulmer, I. S., & Ployhart, R. E. (2013). "Our Most Important Asset." *Journal of Management, 40*(1), 161–192. https://doi.org/10.1177/0149206313511271
24. García-Merino, J. D., Arregui-Ayastuy, G., Rodríguez-Castellanos, A., & García-Zambrano, L. (2010). The intangibles' mindset of CFOs' and corporate performance. *Knowledge Management Research & Practice, 8*(4), 340–350. https://doi.org/10.1057/kmrp.2010.19
25. Giordano, N., Norris, A., Manandhar, V., Shrestha, L., Paudel, D. R., Quinn, N., … Sextos, A. (2021). Financial assessment of incremental seismic retrofitting of Nepali stone-masonry buildings. *International Journal of Disaster Risk Reduction, 60*, 102297. https://doi.org/10.1016/j.ijdrr.2021.102297
26. Goh, K. C., & Yang, J. (2014). Managing cost implications for highway infrastructure sustainability. *International Journal of Environmental Science and Technology, 11*(8), 2271–2280. https://doi.org/10.1007/s13762-014-0572-5
27. Gorelick, D. E., Gold, D. F., Asefa, T., Svrdlin, S., Wang, H., Wanakule, N., ... & Characklis, G. W. (2023). Water supply infrastructure investments require adaptive financial assessment: Evaluation of coupled financial and water supply dynamics. *Journal of Water Resources Planning and Management, 149*(3), 04022084. https://doi.org/10.1061/JWRMD5.WRENG-5863
28. Grozdić, V., & Demko-Rihter, J. (2023). Economic evaluation of investment projects: determining the key factors for final investment decision. *Lex Localis*, *21*(1), 45-70. https://doi.org/10.4335/21.1.45-70(2023)
29. Hannan, M. T. (2006). Organizational identities and the hazard of change. *Industrial and Corporate Change, 15*(5), 755–784. https://doi.org/10.1093/icc/dtl020
30. He, Y., Zhu, L., Li, L., & Liu, G. (2020). Hydrogen and power cogeneration based on chemical looping combustion: Is it capable of reducing carbon emissions and the cost of production?. *Energy & fuels, 34*(3), 3501-3512. https://doi.org/10.1021/acs.energyfuels.9b04157
31. Hopwood, M. W., & Gunda, T. (2022). Generation of Data-Driven Expected Energy Models for Photovoltaic Systems. *Applied Sciences, 12*(4), 1872. https://doi.org/10.3390/app12041872
32. Hosseinian-Far, A., Pimenidis, E., Jahankhani, H., & Wijeyesekera, D. C. (2011, September). Financial Assessment of London Plan Policy 4A. 2 by probabilistic inference and influence diagrams. In *International Conference on Engineering Applications of Neural Networks* (pp. 51-60). Berlin, Heidelberg: Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-23960-1_7
33. Jackson, D., & Tomlinson, M. (2020). Investigating the relationship between career planning, proactivity and employability perceptions among higher education students in uncertain labour market conditions. *Higher education, 80*(3), 435-455. https://doi.org/10.1007/s10734-019-00490-5
34. Kassem, Y., Çamur, H. y Aateg, RAF (2020). Exploring Solar and Wind Energy as a Power Generation Source for Solving the Electricity Crisis in Libya. *Energies, 13*(14), 3708. https://doi.org/10.3390/en13143708
35. Kichou, S., Skandalos, N., & Wolf, P. (2019). Energy performance enhancement of a research centre based on solar potential analysis and energy management. *Energy, 183*, 1195–1210. https://doi.org/10.1016/j.energy.2019.07.036
36. King, A. A., & Lenox, M. J. (2001). Does It Really Pay to Be Green? An Empirical Study of Firm Environmental and Financial Performance: An Empirical Study of Firm Environmental and

Financial Performance. *Journal of Industrial Ecology, 5*(1), 105–116. https://doi.org/10.1162/108819801753358526

37. Leite, C. A. A. F., Alcântara, S. C. S., Ochoa, A. A. V., dos Santos, C. A. C., Dutra, J. C. C., Costa, J. A. P., … Silva, H. C. N. (2021). Natural gas based cogeneration system proposal to a textile industry: a financial assessment. *Energy Efficiency, 14*(2). https://doi.org/10.1007/s12053-021-09927-2
38. Li, J., Weng, G., Pan, Y., Li, C., & Wang, N. (2021). A scientometric review of tourism carrying capacity research: Cooperation, hotspots, and prospect. *Journal of Cleaner Production, 325*, 129278. https://doi.org/10.1016/j.jclepro.2021.129278
39. López-Robles, J. R., Guallar, J., Otegi-Olaso, J. R., & Gamboa-Rosales, N. K. (2019). El profesional de la información (EPI): bibliometric and thematic analysis (2006-2017). *El profesional de la información, 28*(4), e280417. https://doi.org/10.31229/osf.io/s2bv5
40. Ludbrook, A., & Porter, K. (2004). Do interventions to increase income improve the health of the poor in developed economies and are such policies cost effective?. *Applied Health Economics and Health Policy, 3*, 115-120. https://doi.org/10.2165/00148365-200403020-00008
41. Lukas, B. A., Whitwell, G. J., & Doyle, P. (2005). How can a shareholder value approach improve marketing's strategic influence?. *Journal of Business Research, 58*(4), 414-422. https://doi.org/10.1016/s0148-2963(03)00136-x
42. McWilliam, M. K., Friis-Møller, M., Pollini, N., Dykes, K., & Jensen, M. (2022, May). A surrogate model of offshore wind farm support structures for wind farm design and financial valuation. In *Journal of Physics: Conference Series* (Vol. 2265, No. 4, p. 042048). IOP Publishing. https://doi.org/10.1088/1742-6596/2265/4/042048
43. Merry, A. (2001). The right membrane for the job. *Filtration & Separation, 38*(1), 16–18. https://doi.org/10.1016/s0015-1882(01)80139-7
44. Michailos, S., & Bridgwater, A. (2019). A comparative techno-economic assessment of three bio-oil upgrading routes for aviation biofuel production. *International Journal of Energy Research, 43*(13), 7206-7228. https://doi.org/10.1002/er.4745
45. Miguel, S., Moya-Anegón, F., & Herrero-Solana, V. (2007). El análisis de co-citas como método de investigación en Bibliotecología y Ciencia de la Información. *Investigación bibliotecológica, 21*(43), 139-155. http://sedici.unlp.edu.ar/handle/10915/88961
46. Mishra, P. P., & Fathy, H. K. (2018). Achieving self-balancing by design in photovoltaic energy storage systems. *IEEE Transactions on Control Systems Technology, 27*(3), 1151-1164. https://doi.org/10.1109/tcst.2018.2808204
47. Monteiro, S., Almeida, L., Gomes, C., & Sinval, J. (2022). Employability profiles of higher education graduates: a person-oriented approach. *Studies in higher education, 47*(3), 499-512. https://doi.org/10.1080/03075079.2020.1761785
48. Myšková, R., & Hájek, P. (2017). Comprehensive assessment of firm financial performance using financial ratios and linguistic analysis of annual reports. *Journal of International Studies, 10*(4), 96-108. https://www.ceeol.com/search/article-detail?id=607109
49. Nagalakshmi, M., Mishra, P., Yadav, A., Nadar, D., Mishra, A. K., & Bhagat, I. R. (2023). Financial Management Challenges and Impact for Successful Businesses. *Journal of Informatics Education and Research, 3*(2), 1-24. https://doi.org/10.52783/jier.v3i2.480
50. Nußholz, J. L., & Whalen, K. (2019). Financial assessment of reusing materials in buildings: comparing financial potential of wood, concrete, and glass reuse. In *IOP Conference Series: Earth and Environmental Science* (Vol. 225, No. 1, p. 012042). IOP Publishing. https://doi.org/10.1088/1755-1315/225/1/012042
51. Parthasarathy, P., Dailey, D. E., Young, M. E. D., Lam, C., & Pies, C. (2014). Building economic security today: Making the health–wealth connection in Contra Costa County's maternal and child health programs. *Maternal and child health journal, 18*, 396-404. https://doi.org/10.1007/s10995-013-1309-7

52. Pemberton, E. (2020). Welfare Reform and the Logic of Financial Responsibility: Creating the "Value-able" Subject. *New Political Economy*, 1–15. https://doi.org/10.1080/13563467.2019.1708881
53. Prodan, R., Wieczorek, M., & Fard, H. M. (2011). Double auction-based scheduling of scientific applications in distributed grid and cloud environments. *Journal of Grid Computing, 9*, 531-548. https://doi.org/10.1007/s10723-011-9196-x
54. Radu, R., Săndescu, C., Grigorescu, O., & Rughiniș, R. (2020, December). Analyzing Risk Evaluation Frameworks and Risk Assessment Methods. In *2020 19th RoEduNet Conference: Networking in Education and Research (RoEduNet)* (pp. 1-6). IEEE.
55. Rakowska, A., & de Juana-Espinosa, S. (2021). Ready for the future? Employability skills and competencies in the twenty-first century: The view of international experts. *Human Systems Management, 40*(5), 669-684. https://doi.org/10.3233/HSM-201118
56. Ramirez, J., Gallego, G., Ez, W. N. N. N., & Tirado, J. G. (2023). Blockchain Technology for Sustainable Supply Chains: A Bibliometric Study. *Journal of Distribution Science, 21*(6), 119-129. https://doi.org/10.15722/jds.21.06.202306.119
57. Ramírez, R. D. M., Cuervo, F. I., & Rico, C. A. M. (2016). Technical and financial valuation of hydrokinetic power in the discharge channels of large hydropower plants in Colombia: A case study. *Renewable Energy, 99*, 136-147. https://doi.org/10.1016/j.renene.2016.06.047
58. Ramírez-Duran, J. A., Niebles-Núñez, W., & García-Tirado, J. (2023). Aplicaciones bibliométricas del estudio del capital intelectual dentro de las instituciones de educación superior desde un enfoque sostenible. *Saber, Ciencia y Libertad, 18*(1), 280-296. https://doi.org/10.18041/2382-3240/saber.2023v18n1.10020
59. Remondo, J., Bonachea, J., & Cendrero, A. (2008). Quantitative landslide risk assessment and mapping on the basis of recent occurrences. *Geomorphology, 94*(3-4), 496–507. https://doi.org/10.1016/j.geomorph.2006.10.041
60. Ruiz, J. D. G., Duque, E., Peña, A., Jiménez, J., & Patiño, H. A. (2018). Methodological proposal of financial modelling using dynamic scenarios from multivariable data tables. *International Journal of Technology Enhanced Learning, 10*(3), 161. https://doi.org/10.1504/ijtel.2018.092700
61. Shaoul, J. (2011). 'Sharing'political authority with finance capital: The case of Britain's Public Private Partnerships. *Policy and Society, 30*(3), 209-220. https://doi.org/10.1016/j.polsoc.2011.07.005
62. Svetlova, E. (2013). De-idealization by commentary: the case of financial valuation models. *Synthese, 190*(2), 321-337. https://doi.org/10.1007/s11229-012-0148-1
63. Talau, L. (2012). Patients en fin de vie hospitalisés en lits identifiés soins palliatifs: quel impact?. *Médecine Palliative: Soins de Support-Accompagnement-Éthique, 11*(6), 314-324. https://doi.org/10.1016/j.medpal.2012.05.002
64. Tsianaka, E., & Dimitra, S. (2023). Financial Evaluation and Viability of Businesses Using Information Systems after the Implementation of the Greek Accounting Standards. *Theoretical Economics Letters, 13*(4), 905-931. https://doi.org/10.4236/tel.2023.134052
65. Türegün, N. (2022). Financial performance evaluation by multi-criteria decision-making techniques. *Heliyon, 8*(5), 1-13. https://doi.org/10.1016/j.heliyon.2022.e09361
66. Tyler, E., & Chivaka, R. (2011). The use of real options valuation methodology in enhancing the understanding of the impact of climate change on companies. *Business Strategy and the Environment, 20*(1), 55-70. https://doi.org/10.1002/bse.668
67. T'Jollyn, I., Lecompte, S., Vanslambrouck, B., & De Paepe, M. (2018). Energetic and financial assessment of the implementation of an absorption heat pump in an industrial drying system. *Drying technology, 37*(15), 1939-1953. https://doi.org/10.1080/07373937.2018.1546190
68. Wieczorek, M., Podlipnig, S., Prodan, R., & Fahringer, T. (2008, November). Applying double auctions for scheduling of workflows on the grid. In *SC'08: Proceedings of the 2008 ACM/IEEE Conference on Supercomputing* (pp. 1-11). IEEE. https://doi.org/10.1109/sc.2008.5218071