ASSESSING HOUSING AFFORDABILITY: ANALYSIS OF PROPERTY TAX SYSTEMS IN EUROPEAN COUNTRIES

Fuad BAHRAMOV

Doctoral School of Economic Sciences, Faculty of Economic Sciences, University of Oradea, Oradea, Romania
fuad.behremov.96@gmail.com

Abstract: *This paper examines the relationship between property tax systems and housing affordability in European countries. The research contains not only theoretical section, but also empirical analysis. The statistical data used in research was extracted from Eurostat, OECD, and Tax Foundation. As housing affordability increasingly becomes a pressing issue in many European cities, understanding the role of property taxation in shaping affordability dynamics is crucial for policymakers, researchers, and stakeholders. Addressing housing affordability challenges requires a comprehensive understanding of the factors influencing housing costs, with property tax systems playing a pivotal role in shaping housing market dynamics. Through a comprehensive literature review, the paper explores existing research findings on the correlation between property taxation and housing affordability. Utilizing data from the Eurostat database, I conduct a comparative analysis of property tax collection statistics across Europe. It focuses on property tax revenues as percentage of total private stock. In assessing housing affordability, two key indicators were extracted from the Eurostat database: the housing cost overburden rate and housing costs as a proportion of disposable income. Housing costs encompass various expenses associated with dwelling occupancy, including utilities, maintenance, taxes, and insurance. The housing cost overburden rate measures the percentage of households where housing expenses exceed 40% of disposable income, providing insight into the burden of housing costs relative to income. Additionally, paper analyses the proportion of disposable income allocated to housing-related expenses, offering further insight into affordability trends. The findings contribute to understanding the impact of property tax systems on housing affordability in European countries. By evaluating the relationship between property taxation and housing costs, the strategies can be developed to mitigate housing affordability challenges and promote sustainable housing markets.*

Keywords: *Property tax; Housing affordability; Comparative analysis; European countries.*

JEL Classification: *H20; H29; H71.*

1.Introduction

Housing affordability has emerged as a growing concern in Europe, sourced by rapid urbanization, population growth, and evolving economic dynamics. As housing costs continue to increase faster than income growth, policymakers, economists, and urban planners are increasingly turning their attention to the role of property tax systems in shaping affordability levels.

The importance of this topic cannot be overstated. Affordable housing is not only a matter of economic concern, but also it is a fundamental human right and a cornerstone of social stability. Access to adequate and affordable housing is essential for individual well-being, social cohesion, and economic prosperity. Property tax systems play a significant role in this regard, serving as a key component of the government fiscal system and influencing affordability levels.

The objectives of this research paper are twofold. Firstly, it aims to provide a comprehensive review of existing literature on property tax systems and housing affordability, synthesizing theoretical frameworks, empirical studies, and policy analyses to uncover the key factors shaping the relationship between property taxation and housing affordability in European countries. Secondly, it seeks to conduct a comparative analysis of property tax trends and housing cost indicators across European countries.
Methodologically, this study employs a comparative analysis of property tax revenues as a percentage of GDP and housing costs as a percentage of disposable income to examine the impact of property taxation on housing affordability dynamics. The research aims to provide a comprehensive understanding of the relationship between property taxation and housing affordability outcomes.
In summary, through an analysis of the complex correlation between property taxation, housing markets, and socio-economic factors, the study seeks to determine the nature of the relationship between property taxes and housing affordability. By investigating whether this relationship is positive or negative, the research aims to assess the effectiveness of using property taxes as a tool to enhance housing affordability.

2.Literature Review

In recent years, the issue of housing affordability has emerged as a great concern in Europe and beyond, as rapid urbanization, population growth, and changing economic dynamics continue to shape housing markets. The property taxation has the central role in this discussion, and it also constitutes a significant component of the fiscal framework governing housing markets in European countries.
A property tax is a levy imposed by a government on the value of real estate owned by individuals or entities. It is typically based on the assessed value of land, buildings, and other improvements on the property. Housing affordability refers to the capacity of households to cover the expenses associated with housing without significantly limiting their ability to meet other essential living expenses (Lăzărescu & Diacon, 2020). These housing costs encompass various elements such as mortgage or loan interest payments for homeowners, rental fees for tenants, utilities like water, electricity, gas, and heating, as well as expenditures related to routine maintenance and structural insurance.
The governments consider property tax as feasible option for addressing issues such as housing affordability, revenue generation, and economic regulation. Lo (2023) investigated the property tax policies adopted by New York City and Taipei City in response to the global housing affordability crisis for exploring the motivations behind these policies and assessing their effectiveness in addressing that issue. The results show that property tax caps implemented in New York State may inadvertently contribute to rising housing prices, while Taipei City's Hoarding Tax did not fully achieve its purposes and instead shifted the tax burden to homebuyers.
Lyytikäinen (2009) explores the impact of three-rate property taxation on housing construction in Finnish municipalities. Three-rate property tax system refers to a taxation system where different tax rates are applied to various components of property value. There are different tax rates on undeveloped land before development, land after development, and buildings. This system allows municipalities to tailor their property tax rates to incentivize specific types of development and affect land use decisions within their jurisdiction. The study finds that municipalities with a three-rate property tax system saw a significant increase in single-family housing starts. Matheson (2018) advocates that property tax policies can be less effective than macroprudential policy which refers to the set of regulatory measures and tools implemented by central banks and financial authorities to manage and mitigate systemic risks within the financial system. Unlike property-transfer taxes, which can lead to volatile tax rates and may not effectively address systemic risks, macroprudential

measures such as loan-to-value limits offer a more stable framework for regulating lending practices and reducing excessive risk-taking. In my opinion, both macroprudential policy and property tax policy are important in solving housing affordability, albeit in different ways. While macroprudential measures aim to prevent excessive risk-taking by lenders and borrowers, property tax policies can directly influence housing costs and promote affordability through targeted incentives and relief programs for low-income households.

Taxes impact housing affordability in Africa by directly influencing housing costs and indirectly shaping investment decisions in the housing market, which in turn can affect supply, prices, and overall affordability levels (Mutero, 2018). While taxes can play a positive role in promoting housing affordability through investment incentives and revenue generation, they can also have negative effects by increasing costs and distorting market incentives. According to the analytical report of European Commission (2019) property taxes play an important role in housing affordability by influencing the cost of homeownership, rental prices, housing supply, and the utilization of existing housing stock. Decreasing property taxes for affordable housing developments or suggesting tax credits to landlords who provide affordable rental units can assist to increase affordability. There are high level of migration and depopulation in some European regions such as Bulgaria, Romania, and Hungary which create the housing insufficiency, despite of many vacant housing units. The report suggests the implementation of high taxes on those second or vacant properties to incentivize owners to rent or sell out these properties. The activation of unused housing stock which lead to increase the availability of housing options have the potential to develop housing affordability.

Reschovsky (2023) also advocates that taxes can increase the housing affordability according to his OECD publication about the contribution of property taxes to housing inequities in the United States. Property taxes in the United States have a significant impact on housing affordability by influencing housing prices, monthly costs, equity considerations, and the availability of local government services. Efforts to address property tax burdens and ensure a fair distribution of costs can help improve housing affordability for households across income levels.

In conclusion, the literature review contains the intricate relationship between property tax systems and housing affordability. It mentions the growing concern over housing affordability amid urbanization and economic shifts and highlights the importance of property taxation in improving the affordability not only in Europe, but also in other continents.

3.Comparative View on Property Tax Collection in Europe

The issue of housing affordability has emerged as a significant concern across Europe, driven by factors such as rapid urbanization, population growth, and evolving economic dynamics. Central to this discussion is the role of property taxes, which not only form a crucial component of the fiscal framework governing housing markets but also shows indirect substantial influence on housing affordability. This section explores the comparative view on property tax collection and housing affordability in various European countries.

Almost all European countries levy some form of property tax on real estate. Liechtenstein and Malta do not impose recurrent type of taxes on property (there are other property taxes such as property transfer tax, inheritance property tax). In contrast, Estonia stands out as the only country in this comparison that taxes solely land, rather than the entire real property (Mengden, 2023). It may result in lower overall property taxes compared to countries that tax both land and improvements. This approach could potentially contribute to housing affordability by reducing the tax burden on property owners, particularly those with valuable structures or improvements on their land. Lower property taxes may make homeownership more accessible and affordable for individuals and families in Estonia. Belgium, Greece, France, and Spain are among the highest ranked countries, with property taxes ranging from

3.0% to 4.9% of GDP and property tax revenues ranging from €6,192 million to €108,605 million in 2022. Conversely, Lithuania, Slovakia, Romania, and Estonia are among the lowest ranked countries, with property taxes ranging from 0.3% to 0.9% of GDP and property tax revenues ranging from €92 million to €1,610 million in 2022. These variations underscore the diverse approaches to property taxation and the significant impact on revenue generation across European nations.

Over the period from 2015 to 2022, several European countries experienced notable fluctuations in their property tax trends according to Eurostat (2024). For instance, Iceland saw a remarkable spike in property taxes as a percentage of GDP in 2016, soaring to 17.5%, which was significantly higher than its usual range. This sharp increase was followed by a period of stabilization. On the other hand, Denmark demonstrated a gradual decline in property taxes from 2.7% in 2015 to 2.3% in 2022. Estonia maintained a consistently low rate, while Greece and Latvia saw minor decreases. A slight decrease was observed in property taxes as a percentage of GDP over the period. In 2015, property taxes stood at 2.3% for the EU-27 and 2.5% for the EA-19, slightly dropping to 2.1% and 2.3%, respectively, by 2022. Despite the decline, both entities maintained relatively stable rankings over the period. Additionally, the property tax revenues for 2022 indicate substantial revenue generation, with €332,716 million for the EU-27 and €302,561 million for the EA-19, suggesting a significant financial contribution from property taxes to the fiscal budgets of these regions.

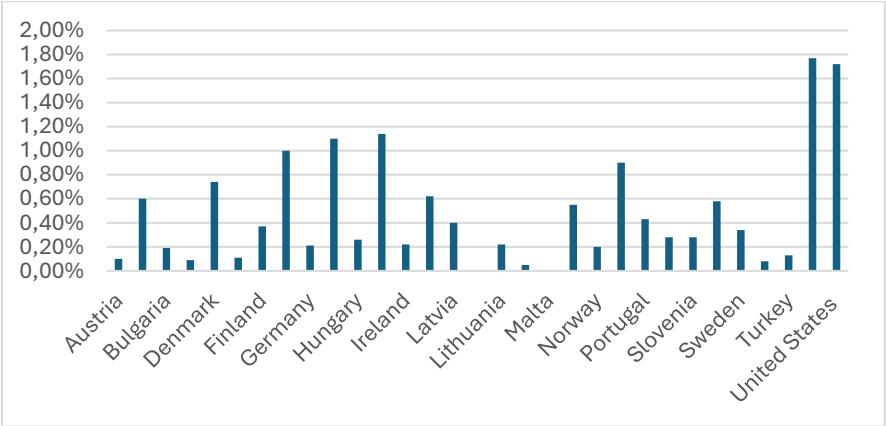


Figure 1: Property tax as percentage of private capital stock, 2021
Source: Authors' representation based on Tax Foundation. Available at: https://taxfoundation.org/data/all/global/real-property-taxes-in-europe-2023/ accessed in 20.04.2024.

The first figure presents property tax revenues as a percentage of total private capital stock for various European countries, including the United States and Turkey, in 2021. Property tax revenues as a share of total private capital stock indicate the proportion of property tax revenues generated relative to the total value of privately owned assets within a country. Higher percentages suggest that property taxes contribute more significantly to the overall wealth or value of privately owned assets in a nation. Noteworthy countries with relatively high property tax revenues compared to private capital stock include the United Kingdom (1.77%), Greece (1.10%), and Iceland (1.14%). Conversely, nations such as Liechtenstein (0.00%) and Malta (0.00%) exhibit zero property tax revenues relative to private capital stock (those countries do not impose recurrent taxes on property). The inclusion of the United States (1.72%) and Turkey (0.13%) offers a comparative perspective on property tax revenue as a share of total private capital stock between European countries and these two nations.

In conclusion, the analysis of property tax systems in European countries reveals significant variations in property tax revenues relative to total private capital stock.

4.Housing affordability and its relationship with property taxation.

In terms of housing, overall, 69% of the population in Europe, live in their own houses, while 31% live in rented houses. There are distinctive regional patterns in housing types. For example, countries in Eastern Europe tend to have higher rates of homeownership, while those in Western Europe have higher rates of renting. This could be influenced by historical, cultural, and economic factors shaping housing policies and preferences in each region. The house prices sharply increased in 24 member countries in region. Overall, 47% increase was observed in the EU between 2010 and 2022 in house prices and 18% increase in rents according to Eurostat.
Generally, housing cost overburden was registered very high in big cities. The housing cost overburden rate is an indicator of housing affordability. It measures the percentage of the population living in households where housing costs represent more than 40% of disposable income. This indicator helps assess the extent to which households are burdened by their housing expenses relative to their income.

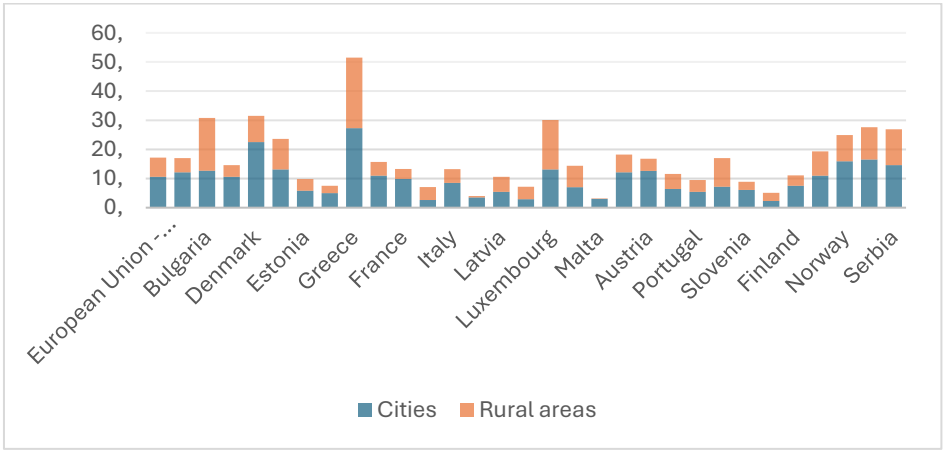


Figure 2: Housing cost overburden rate in cities and rural areas, 2022
Source: Authors' representation based on a database of Eurostat, EU-SILC survey, available at https://ec.europa.eu/eurostat/databrowser/bookmark/411e17fd-9b03-4729-8ad9-ea4844481e08?lang=en accessed on 20.04.2024.

The figure 2 represents the percentage of the population experiencing housing cost burdens in both urban (cities) and rural areas. A higher housing cost overburden rate indicates a greater financial strain on households due to housing expenses and it means the low level of housing affordability. In general, urban areas tend to have higher housing cost overburden rates compared to rural areas. For example, countries like Denmark, Germany, and Sweden exhibit higher housing cost overburden rates in urban areas, reflecting the affordability challenges faced by city dwellers.
In cities, Belgium has a rate of 12.1%, indicating that approximately 12.1% of urban households spend more than 40% of their disposable income on housing costs after deducting housing allowances. Similarly, in rural areas of Belgium, the rate is lower at 4.9%. On the other hand, in Greece, the overburden rate is significantly higher in both cities and rural areas, standing at 27.3% and 24.2%, respectively. This indicates a greater proportion of households facing housing affordability challenges across both urban and rural regions in

Greece compared to Belgium. Other countries with notable differences between urban and rural overburden rates include Luxembourg, where the rate is 13.1% in cities and substantially higher at 17.0% in rural areas, and Cyprus, with rates of 3.5% in cities and 0.5% in rural areas, suggesting relatively lower housing affordability challenges in rural Cyprus compared to urban areas.
In Romania, the housing cost overburden rate shows a notable difference between urban and rural areas. In urban settings, the rate stands at 7.2%, indicating that a portion of city face challenges with housing affordability, spending more than 40% of their disposable income on housing costs after deducting housing allowances. However, in rural areas, the overburden rate is higher at 9.8%, suggesting a greater proportion of rural households experiencing housing cost burdens compared to their urban counterparts.
Another indicator for measuring the housing availability is housing cost in disposable income. Overall, about 20% of available income was contributed to housing in Europe in 2022.

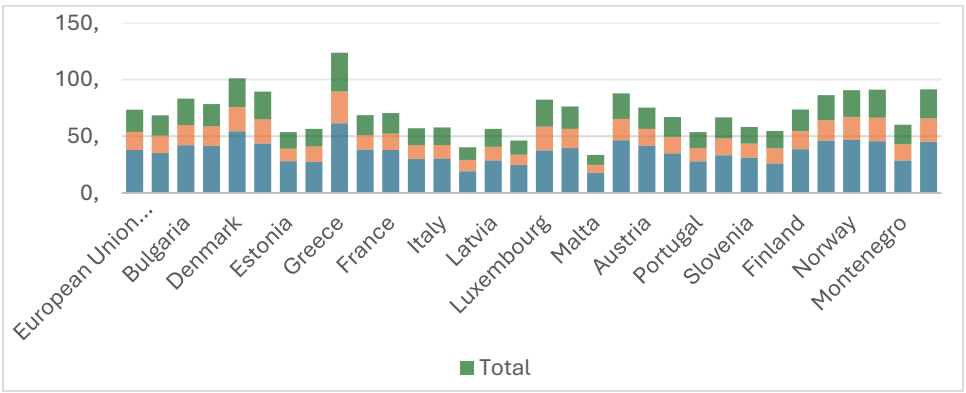


Figure 3: Housing costs as percentage of disposable income – Total, 2022
Source: Authors' representation based on a database of Eurostat, EU-SILC survey, available at https://ec.europa.eu/eurostat/databrowser/bookmark/659e8061-cde5-4ddb-b633-7cff3c16b7bd?lang=en accessed on 20.04.2024.

The figure 3 indicates insights into housing costs as a percentage of disposable income across European countries in 2022, categorized by income levels. The high indicator means the low level of housing affordability. For countries within the European Union (EU-27), households with incomes below 60% of the median equivalised income spent 37.9% of their disposable income on housing costs. The low-income people struggle to pay housing costs. However, people with income above 60% of median income spent only 16% of their disposable income on housing. In countries like Belgium, households below the 60% income threshold spent 35.2% of their disposable income on housing, while those above the threshold spent 15.4%. This indicates a notable disparity in housing cost burden between income groups. Similarly, in Bulgaria, households below the income threshold spent 42.2% of their disposable income on housing, compared to 17.7% for those above the threshold, highlighting significant challenges for low-income individuals in meeting housing expenses.
In terms of relationship between the house affordability and property taxes, the property tax revenues as percentage of GDP and housing costs as percentage of disposable income (as an indicator of housing affordability) are used in the following graph. There are not exact tax rates to impose on properties in selected countries. According to OECD data (2021), in Europe, property tax rate ranges vary significantly among countries. For instance, in Denmark, rates fluctuate between 1.6% and 3.4%, with reductions for properties used in agriculture and forestry. Spain implements rates from 0.4% to 1.10% for urban properties and 0.3% to 0.9% for rural ones, with potential increases for specific circumstances. Austria's rates are diverse, with 0.16% for agricultural land and forests, 0.05% to 0.1% for single-

family houses, and 0.1% to 0.15% for rented or mixed-use properties. Therefore, property tax revenues are used in analysis.

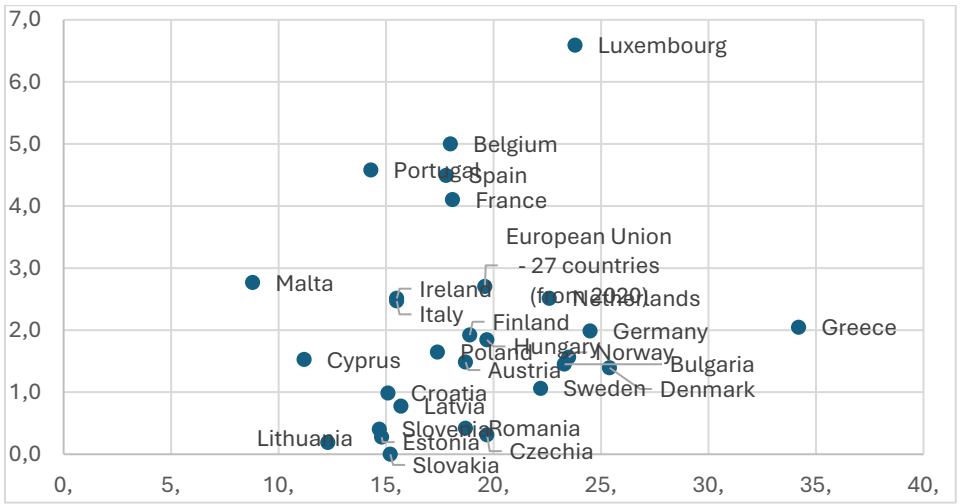


Figure 4: Relationship between property taxes as percentage of GDP and housing costs as percentage of disposable income, 2022.
Source: Authors' representation based on a database of Eurostat.

Figure 4 demonstrates the relationship between property taxes as percentage of GDP and housing costs as percentage of disposable income for the year 2022. Both negative and positive relationship can be observed between them in figure. Some countries indeed exhibit a positive relationship, where higher property tax revenues as a percentage of GDP correspond to higher housing costs as a percentage of disposable income. For example, Belgium, Greece, and Luxembourg have relatively high property tax revenues as a percentage of GDP (5.0%, 2.0%, and 6.6% respectively), and they also have higher housing costs as a percentage of disposable income (18.0%, 34.2%, and 23.8% respectively). This suggests that higher property tax burdens may be associated with higher housing costs, potentially reducing housing affordability. Conversely, there are instances of a negative relationship where higher property tax revenues as a percentage of GDP correspond to lower housing costs as a percentage of disposable income. For instance, countries like Czechia, Lithuania, and Slovenia have lower property tax revenues as a percentage of GDP (0.3%, 0.2%, and 0.4% respectively), and they also have lower housing costs as a percentage of disposable income (19.7%, 12.3%, and 14.7% respectively). This suggests that these countries might have implemented policies to keep housing costs lower relative to disposable income, possibly through subsidies or regulations. Overall, the relationship between property tax revenues and housing affordability is complex and can vary based on factors such as government policies, economic conditions, and housing market dynamics.
Several countries in Europe implement different exemptions, relief measures, or subsidies in case of property taxes which may help to increase housing affordability indirectly. For example, the Netherlands exempts small, affordable homes to streamline tax collection. Belgium suggests exemptions to the size and occupancy of residences. Germany and Slovenia encourage new construction and renovations through temporary or permanent exemptions on building value. Ireland even exempts new mines from taxes for their first seven years. Romania offers property tax breaks for certain groups. Low-income people might not have to pay property taxes on homes that are small or inexpensive. Similarly, elderly people can qualify for tax relief based on their income and yearly assessments. There might also be help for people facing financial difficulties, though the specifics can differ.

These exemptions aim to boost the economy, help specific groups, and promote development.

5.Conclusion

The comprehensive review of literature on property tax systems and housing affordability across Europe provides valuable information into the complex relationship between these two aspects. The analysis highlights the complicated nature of property taxation and its significant impact on housing affordability, not only in Europe but also in other regions. Key findings indicate that property tax policies play a crucial role in addressing housing affordability challenges, revenue generation, and economic regulation. However, the effectiveness of these policies varies depending on factors such as market dynamics, governance structures, and regional contexts. While property taxes are a common tool used by governments to influence housing affordability, their impact can be nuanced and affected by different factors such as tax rates, exemptions, relief measures, and subsidies.

The relationship between property taxes and housing affordability in European countries is multifaceted and dynamic, influenced by various factors including tax policies, economic conditions, and housing market dynamics. Analysis of property tax trends from 2015 to 2022 reveals notable fluctuations across different nations, with some experiencing significant declines in property tax revenues as a percentage of GDP. Despite a slight overall decrease in property taxes as a percentage of GDP over the period, substantial revenue generation from property taxes highlights their significant contribution to fiscal budgets.

Regarding housing affordability, data on housing costs as a percentage of disposable income indicates varying levels of affordability across Europe, with urban areas generally experiencing higher housing cost overburden rates compared to rural areas. Some countries exhibiting a positive correlation between property taxes and housing costs, suggesting that higher property tax burdens may contribute to increased housing costs. Conversely, other nations demonstrate a negative correlation, indicating potential policy interventions to maintain housing costs lower relative to disposable income. Examples of countries showing a positive correlation between property taxes and housing costs include Belgium, Greece, and Luxembourg, while countries like Czechia, Lithuania, and Slovenia show a negative correlation.

Countries implement various exemptions, relief measures, and subsidies to address housing affordability indirectly, including tax breaks for certain groups, exemptions for small or affordable homes, and incentives for new construction or renovations. However, to enhance housing affordability comprehensively, governments should adopt a complex approach that combines property tax reforms with initiatives to increase the supply of affordable housing, enhance financial accessibility, and foster inclusive urban development.

References

1.European Commission. (2019). *Housing affordability and sustainability in the EU*, Analytical Report. Available in: https://single-market-economy.ec.europa.eu/system/files/2021-02/ecso_ar_housing_affordability_2019_0.pdf accessed in 15.04.2024.
2.Eurostat (2024), EU-SILC survey, available at https://ec.europa.eu/taxation_customs/document/download/190b142c-f6ea-4549-a37b-4273ff32c8a2_en accessed on 20.04.2024.
3.Eurostat (2024), EU-SILC survey, available at https://ec.europa.eu/eurostat/databrowser/bookmark/411e17fd-9b03-4729-8ad9-ea4844481e08?lang=en accessed on 20.04.2024.
4.Eurostat (2024), EU-SILC survey, available at https://ec.europa.eu/eurostat/databrowser/bookmark/6eeb03d1-dd59-4bb4-a9b8-ad21bed9cd21?lang=en accessed in 20.04.2024.

5.Lăzărescu, L.-M., & Diacon, D.L. (2020) *A Comparative Analysis of the Housing Affordability in Romania and the European Union from the Perspective of the Housing Costs*. In C. Nastase (Vol. Ed.), Lumen Proceedings: Vol. 13. 16th Economic International Conference NCOE 4.0 2020 (pp. 93-104). Iasi, Romania: LUMEN Publishing House. Available at https://www.proceedings.lumenpublishing.com/ojs/index.php/lumenproceedings/article/download/321/340 accessed in 17.04.2024.
6.Lo, H. (2023), *The Housing Affordability Crisis: Property Tax as Problem-solver or Troublemaker,* Available at: https://dash.harvard.edu/handle/1/37377302 accessed in 14.04.2024.
7.Lyytikäinen, T. (2009), *Three-rate property taxation and housing construction*, Journal of Urban Economics, 65(3), pp. 305–313. Doi: 10.1016/j.jue.2009.01.002.
8.Matheson, T.D. (2018), *Balancing Financial Stability and Housing Affordability: The Case of Canada*, IMF Working Paper Series, Working Paper No. 2018/237, Available at https://www.elibrary.imf.org/downloadpdf/journals/002/2018/222/article-A002-en.pdf accessed in 14.04.2024.
9.Mengden, A. (2023). *Real Property Taxes in Europe 2023*. Tax Foundation. Available at: https://taxfoundation.org/data/all/global/real-property-taxes-in-europe-2023/ accessed in 20.04.2024.
10.Mutero, J. (2018). *Taxation and Affordable Housing in Africa*. CAHF Working Paper Series. Available at https://housingfinanceafrica.org/app/uploads/Taxation-and-Affordable-Housing-in-Africa_final-edits-ltso.pdf accessed in 19.04.2024.
11.OECD. (2021). *Tax rates across OECD countries*. Responses from the OECD Survey on Recurrent Taxes on Immovable Property. Available in https://www.oecd-ilibrary.org/sites/3d5a8040-en/index.html?itemId=/content/component/3d5a8040-en# accessed in 21.04.2024.
12.Reschovsky, A. (2023), *Do property taxes in the United States contribute to housing inequities?* in Dougherty, S. and H. Kim (eds.), Bricks, Taxes and Spending: Solutions for Housing Equity across Levels of Government, OECD Publishing, Paris. Available at https://www.oecd-ilibrary.org/sites/7d9fe802-en/index.html?itemId=/content/component/7d9fe802-en#wrapper accessed in 16.04.2024.

THE IMPACT OF USING ARTIFICIAL INTELLIGENCE AND ERP SYSTEMS IN THE WORK OF ACCOUNTING PROFESSIONALS AND AUDITORS

Laura – Eugenia – Lavinia BARNA[1], Corina – Cătălina HURDUCACI (GOREA)[2]

[1]Bucharest University of Economic Studies, University Assistant PhD and Post-PhD researcher in Management Informatics Department, Bucharest, Romania
[2]Bucharest University of Economic Studies, PhD student, Doctoral School of Accounting, Bucharest, Romania
laura.barna@cig.ase.ro
hurducacigoreacorina22@stud.ase.ro

Abstract: *Recent developments in IT have changed the way accounting professionals and auditors do business. The research conducted in this article aims to explore how artificial intelligence and ERP systems offer opportunities to increase efficiency, accuracy and improve decision making in companies operating in the accounting and auditing industry. One of the results obtained from the bibliometric analysis indicates that artificial intelligence enables the automation of repetitive tasks, allowing the analysis of a large set of data to support strategic decision making. In addition, the integration of ERP systems streamlines financial processes, improves data management and ensures compliance with regulatory requirements.*
The digitalization of the accounting profession has transformed traditional practices and revolutionized the way accounting professionals operate in today's digital age. By embracing digital tools and platforms, accounting professionals can enhance efficiency, accuracy, and collaboration, ultimately improving the quality of financial reporting and analysis. The role of these technologies (artificial intelligence and ERP systems) is to streamline workflows, increase productivity and adapt to evolving industry requirements.
The research in this article was based on a bibliometric analysis that aimed to observe research trends in this field, through which to observe or identify uncovered areas and future research directions in this field.
Following a comprehensive analysis of the benefits and challenges associated with the adoption of artificial intelligence and ERP systems in accounting and auditing practices, this study aims to provide valuable insights to these professionals as a result of the upward trend of the digitalization phenomenon. As a result of the digitisation of business, the article provides valuable information needed by accounting professionals and auditors to help them remain competitive in a rapidly changing landscape.

Keywords: *artificial intelligence, ERP systems, accounting profession, sustainability.*

JEL Classification: *B26, M40, M41, M42*

1. Introduction

IT systems are used at every step, so that any activity depends a lot on the use of new technologies to make them more efficient, bringing added value to any activity. If we analyze the way in which accounting activities were carried out in the past, the fact that most activities were done manually, we can observe an evolution of all activities as a result of the digitization of processes, the fact that repetitive activities have been replaced facilitating the improvement of the flow of information between the employees of an organization .
The adoption of applications based on artificial intelligence (AI) as expert systems both in the field of accounting and auditing aimed to reduce errors and increase the efficiency of

accounting and financial processes (Berdiyeva et al., 2021). The main role of artificial intelligence is to find fraudulent operations by identifying unusual operations, providing essential functions for data processing and transparency, to ensure the most accurate and complete reporting.
The role of new AI technologies and ERP systems is to ensure the increase of an organization's performance, minimize errors and increase the productivity of employees and the organization.
Most of the time, ERP systems are used by organizations with the aim of centralizing processed data much more easily, providing support for the decision-making process and for managerial accounting (Khamis et al., 2023).
Even if the automation and digitization of certain tasks and processes bring benefits to organizations, the main disadvantages would be the increase in the unemployment rate in these fields as a result of the fact that most tasks become automated.
However, the main objective of the work is to analyze the impact of the use of artificial intelligence and ERP systems in the accounting and auditing profession, trying to identify the main relevant aspects based on bibliometric analysis.
The article is presented further with a vast specialized literature where the main concepts were defined, then it continues with the presentation of the research method and the analysis of the results obtained, and finally the article ends with the main conclusions regarding the case study addressed in the article.

2. Literature review

The future of the accounting and auditing profession depends a lot on the evolution of new technologies, which help or provide support for analytical and cognitive structures and processes. In Industry 4.0, accounting companies must remain competitive and constructive in order to survive the evolution of the digitalization phenomenon.
According to Berdiyeva et al. (2021, p. 58), *"expert systems are artificial intelligence programs introduced during the 1980s that achieve a degree of competence that can replace human expertise in a given decision-making area"*. AI can be considered an important tool that can provide numerous opportunities for accounting and auditing professionals, improving their effectiveness and productivity.
The benefits of automating the tasks of accounting professionals for the following activities (Ezenwa and Nken, 2021):

- reporting (month or quarter closing, internal performance reporting, external statutory)
- accounts payable (automatic approvals)
- customer and supplier data
- validating and posting payments
- creating / processing / delivering invoices and billing
- period-end closing (sub-ledger closing, validation of journal entries, general ledger, consolidation, low-risk accounts reconciliation
- general ledger accounting
- cash management
- inventory accounting
- intercompany transactions
- expense reports
- reimbursement requests
- audit, payroll, tax accounting, fixed assets accounting

Even if the role of new AI technologies and ERP systems is to ensure the correctness of processed data, professional accountants and auditors consider it better to supervise the data entered and processed with their help (Hasan, 2022; Zhang et al., 2020).

According to Hasan (2022) and Svitlana and Olha (2024), AI ensures the fulfillment of 3 objectives specific to a company presented in figure 1.

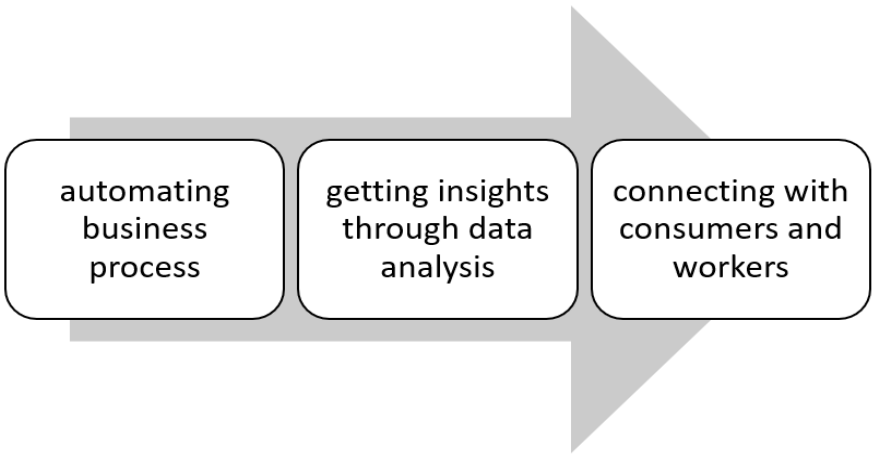


Figure 1: Three objectives specific to a company
Source: Hassan, 2022

ERP systems offer support in the processing of accounting data, more specifically in managerial accounting with the role of informing managers (Khamis et al., 2023). Management accounting *"also includes the preparation of financial reports for non-management groups such as shareholders, creditors, regulatory agencies, and tax authorities"* (Mihaila, 2014 cited by Khamis et al., 2023). The main benefits identified in accounting and auditing as a result of the use of AI and ERP systems are: saving time, higher data accuracy, fast data analysis, in-depth perspective of business processes, standardized services for clients (Munoko et al, 2020; Solaimani et al., 2020). Other benefits identified by Srbinoska and Donovska (2023) were: *"high quality of reporting, up-to-date decision making, better resource use given the increased efficiency and reduced processing time"*. The disadvantages of these systems are *"high costly and specific know-how"*.

3. Research methodology

The research in this article was based on a bibliometric analysis that aimed to observe research trends in this field, through which to observe or identify uncovered areas and future research directions in this field.
The sample of articles used for the case study was selected from the Web of Science in April 2024 based on the following keywords: *artificial intelligence, ERP systems, accounting profession, audit, performance and sustainability*.
To analyse the sample, the authors used the RStudio application, using the Biblioshiny package, which is an R-tool for comprehensive science mapping analysis. Bibliometric analysis is a unique tool, developed in the statistical computing and graphic R language, according to a logical bibliometric workflow (Bibliometrix, 2024).
This analysis is a structured analysis of a large body of information, to show a *"big picture"* on a certain analyzed topic.
The foundation for this quantitative research was a dataset extracted from the Web of Science database. The search was guided by the following query string:
(TS=("Artificial Intelligence" AND "Accounting") OR TS=("Artificial Intelligence" AND "Auditing") OR TS=("ERP" AND "Auditing") OR TS=("ERP" AND "Accounting") OR TS=("Technology Impact" AND "Accounting Professionals") OR TS=("Technology Impact"

AND "Auditing Professionals") AND TS=("PERFORMANCE") AND TS=("sustainability")) covering the period from January 1, 2010, to March 31, 2024. Initially, a total of 1497 articles were selected. To refine the analysis for greater relevance to the field, the search was narrowed down by limiting the Web of Science reference areas to (WC ="Business Finance" OR "Management" OR "Business" OR "Economics"), resulting in a final count of 472 documents.
The commencement of the study involved a descriptive bibliometric analysis to map the academic dynamics of the field. This phase included examining annual publication trends, geographic dispersion of studies, identifying significant sources, as well as pinpointing the most prolific authors in the area.
In the subsequent phase, a keyword co-occurrence analysis was conducted to gauge the intensity of co-occurrence connections and to pinpoint the terms with the strongest links. The outcome was an illustrative network of the major themes and their interrelations, highlighting keywords as the core representation of the research content and the primary interests within the domain.

4. Results analysis

A longitudinal examination of academic literature can provide insightful perspectives on the shifting scientific focus within a particular field of study. The analysis depicted in Figure 2 scrutinizes the annual distribution of publications from 2010 to 2024, focusing on the key terms that have been previously identified as particularly significant for the domain under study. This graphical representation unveils the temporal dynamic of scholarly output and may indicate shifts in research priorities or an upsurge in scholarly activity within the thematic spectrum.

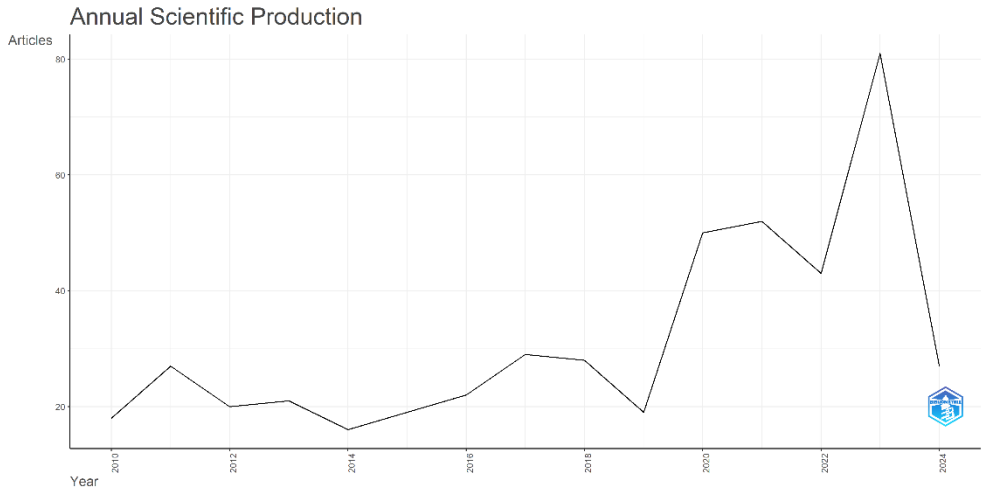


Figure 2: Annual Scientific Production
Source: Authors own creation using Bibliometrix (Biblioshiny), 2024

The chronological study of academic publications between 2010 and 2024 reveals a notable fluctuation in the volume of published works. Detailed analysis indicates a marked expansion in the number of publications, reaching a peak of 81 articles in 2023, which denotes an increased scientific interest in the selected research themes. The early phase of the examined period shows a moderate publication frequency, which then exhibits a gradual increase, culminating in 51 papers in 2021. This trend can be interpreted as aligning with theoretical and practical advancements in the field of artificial intelligence and ERP

systems, with direct implications for accounting and auditing practices, and points to an escalating dynamism of academic research in these interdisciplinary areas.
Figure 3 presents a geographical analysis of the literary contribution in the field of artificial intelligence and ERP systems application in accounting and auditing. The distribution of publication frequency highlights a clear leadership by the United States, with 368 works, followed by a strong academic presence in China, accounting for 113 publications. The United Kingdom also makes a significant contribution to the literature, with 89 works. Interest in this research field is also evident in Romania, with a total of 79 contributions, marking a notable global presence. Australia with 65 works, Italy with 59, Ukraine with 55, Germany with 50, Portugal with 39, and Canada with 38, showcase vibrant and diverse research activities across multiple regions. This geographical representation clearly shows that research in the area of accounting and auditing assisted by artificial intelligence and ERP systems is a topic of global interest, demonstrating widespread commitment and involvement in this interdisciplinary field.

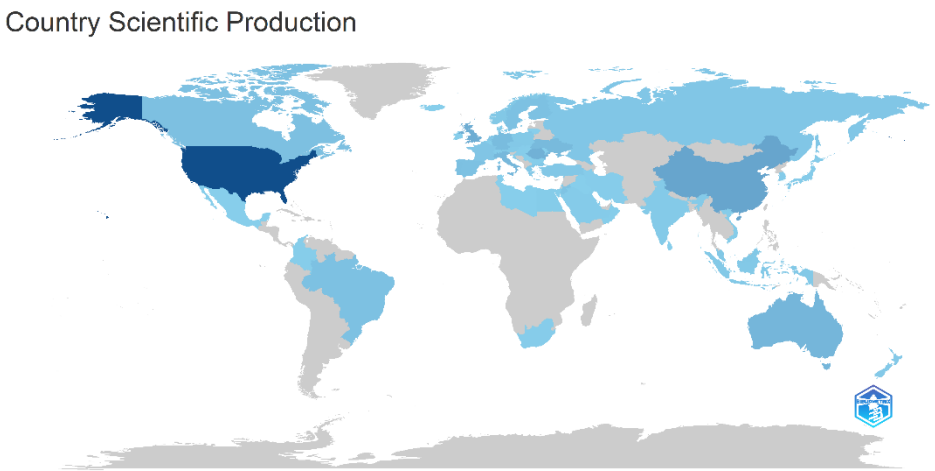


Figure 3: Country Scientific Production
Source: Authors own creation using Bibliometrix (Biblioshiny), 2024

A bibliometric examination of the distribution of scientific works across various academic journals demonstrates a wide array of editorial channels that support and disseminate studies in the realm of artificial intelligence application in auditing and accounting.

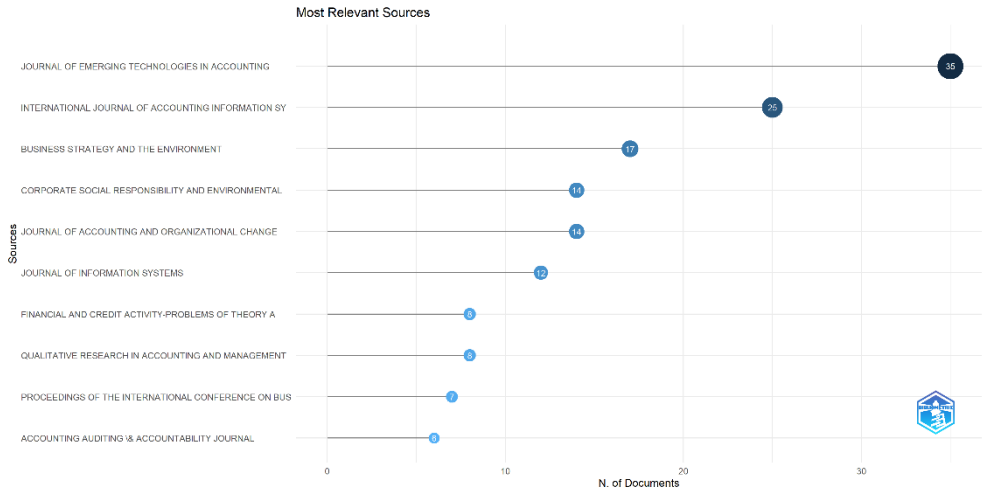


Figure 4: Most Relevant Source
Source: Authors own creation using Bibliometrix (Biblioshiny) , 2024

The chart in Figure **4** represents a scatter plot of the most relevant sources addressing the impact of artificial intelligence (AI) and enterprise resource planning (ERP) systems in accounting and auditing. We observe that the most prolific source is the "Journal of Emerging Technologies in Accounting," with 35 documents, indicating that this publication may be a leading journal in research related to emerging technologies in the accounting field.

The "International Journal of Accounting Information Systems" also appears prominently, with 25 works, suggesting a focus on how accounting information systems integrate new technologies, including AI and ERP.

Journals such as "Business Strategy and the Environment" and "Corporate Social Responsibility and Environmental Management" also have a significant number of works (both with 14 documents), which could indicate an exploration of the impact of AI and ERP technologies not only from the perspective of financial performance but also from that of sustainability and corporate social responsibility.

The "Journal of Accounting and Organizational Change" and the "Journal of Information Systems," with 12 works each, suggest that these research areas are dynamic and evolving, reflecting organizational and technological changes in accounting and auditing.

Other sources, such as "Financial and Credit Activity-Problems of Theory and Practice," "Qualitative Research in Accounting and Management," and the "Proceedings of the International Conference on Business," with 8 and respectively 7 documents, show the diversity of discussion forums and research perspectives.

Finally, the "Accounting Auditing & Accountability Journal," with 6 documents, rounds out the picture of the leading scientific journals contributing to the academic dialogue on the integration of AI and ERP into accounting and auditing practices. This variety of sources illustrates the interdisciplinary and multifaceted field of the study of technological impact in accounting and auditing.

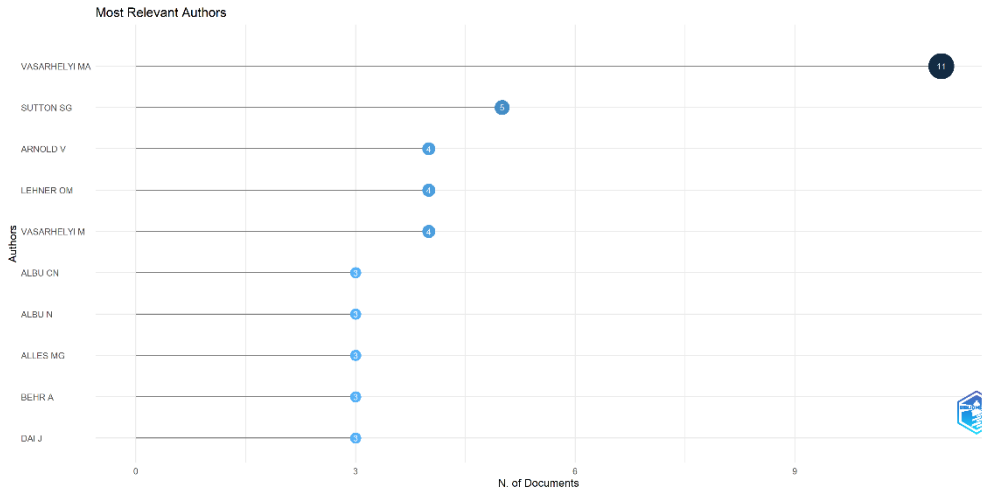


Figure 5: Most Relevant Authors
Source: Authors own creation using Bibliometrix (Biblioshiny), 2024

Figure 5 depicts the most prominent authors within the realm of artificial intelligence and enterprise resource planning systems in the context of accounting and auditing. The table ranks these scholars by the number of their scholarly contributions to the field, offering a clear view of who the most prolific individuals are in terms of publication volume. At the pinnacle, we observe VASARHELYI MA, whose substantial number of documents—11 in total—underscores his leading position. This is followed by SUTTON SG and ARNOLD V, with a considerable number of publications themselves. The sequence continues, delineating the academic footprint of each author, with LEHNER OM and ALBU CN also contributing notably to the domain.

The visual arrangement in this table serves not just to identify individual scholarly output but also to signify the depth of research engagement and influence across the academic community. Such a ranking not only recognizes individual accomplishment but also paints a picture of the collaborative network that drives forward the boundaries of knowledge in this interdisciplinary field.

In Figure 6, we have presented a word cloud, which is a data visualization form that highlights the most frequently used terms within a text or dataset. This word cloud displays the frequency of keyword usage in the analyzed publications, with the size of each term being proportional to its occurrence frequency in these publications.

Figure 6: WordCloud
Source: Authors own creation using Bibliometrix (Biblioshiny), 2024

The terms "artificial intelligence," "big data," "erp" (Enterprise Resource Planning), and "blockchain" denote a strong focus on emerging technologies and their impact on the fields of management and accounting. Terms like "performance", "implementation", "technology", "management" and "information systems" are among the largest, and thus are the central themes or primary areas of interest in the literature associated with the analyzed dataset. "Artificial intelligence" features with a frequency of 56 occurrences in articles, followed by "impact" mentioned 53 times, and "management" with a frequency of 52.

Words such as "audit", "accountability", "governance" and "control" suggest that a significant part of the research addresses the application of technologies in audit processes and corporate governance, highlighting concerns related to accountability and internal control.
The emergence of terms from various fields signals an interdisciplinary character of the research, reflecting the integration of information technology with management, accounting, and auditing.
Terms like "adoption", "determinants", "challenges" and "future" indicate an interest in studying the factors that influence the adoption of technologies, current challenges, and future research directions.
The presence of words like "decision-making" and "strategy" underscores the relevance of data analysis in supporting the decision-making process and in formulating strategies within organizations.
The word "education" suggests a focus on training and developing competencies necessary to navigate the continually changing landscape of technology in the financial-accounting field, for inclusion in a scientific article.

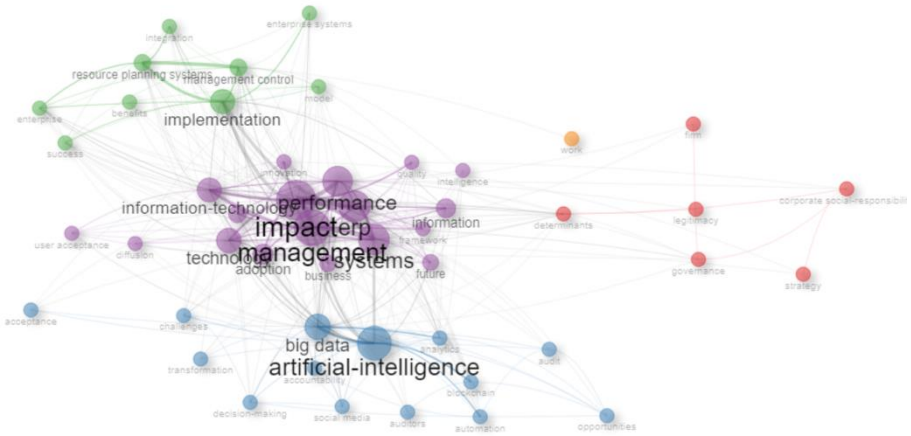


Figure 7: Co-occurrence Network
Source: Authors own creation using Bibliometrix (Biblioshiny) , 2024

To emphasize the dynamic and complex nature of research in the field, as well as to demonstrate the vast network of interconnected subjects that influence accounting and auditing practices in the digital age, we employed a keyword network analysis, represented in Figure 7. It is observed that terms such as "performance", "impact" and "management systems" appear as large, centrally connected nodes, indicating that these are key concepts in the discussion on the effects of artificial intelligence and ERP in the accounting domain.
Words like "big data" and "analytics" are closely linked with "artificial intelligence" illustrating how these themes are interdependent and relevant in the current context of accounting and auditing.
Through nodes like "transformation" and "innovation" the diagram shows an openness to topics that reflect changes and technological progress in the sector.
Terms such as "challenges" and "opportunities" situated near "artificial intelligence," suggest that the literature is exploring not only the advantages of AI and ERP but also the difficulties encountered in their implementation and adoption.
The presence of terms like "corporate social-responsibility" and "governance" indicates attention to corporate responsibility and governance in the era of digitalization.

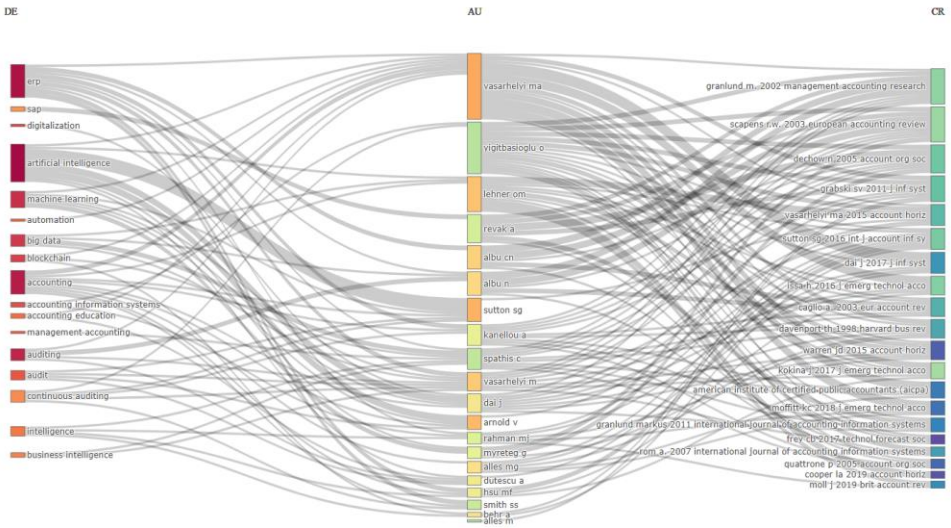


Figure 8: Three-Field Plot
Source: Authors own creation using Bibliometrix (Biblioshiny) , 2024

Figure 8 represents a tripartite graph, which visualizes the relationships between keywords (DE), authors (AU), and cited works (CR) in the field of accounting and auditing, with an emphasis on the impact of technologies such as ERP and artificial intelligence.
We observe significant interconnectedness within the academic community, with many authors contributing to a variety of subjects, suggesting an interdisciplinary and collaborative approach in research. There is a dense network of connections between certain authors and specific keywords, indicating that these individuals are major contributors in their respective fields. Certain authors, such as Vasarhelyi, Sutton, and Albu, have a significant influence, as evidenced by their multiple connections to key terms and reference works. They can be considered thought leaders in research on artificial intelligence and ERP systems in accounting and auditing.
There are pivotal works that seem to be key references in the field, indicating impactful papers in accounting and auditing. Frequently cited journals and works, such as "Management Accounting Research" and "International Journal of Accounting Information Systems", are key sources in the field, providing foundational research or significant reviews of the literature.
Terms that appear central, such as "erp", "artificial intelligence", "machine learning", and "big data", reflect the current research interest core, underlining the significance and impact of information technology on managerial accounting and auditing practices.
The map suggests that certain thematic areas, such as the application of AI in accounting and auditing, are growing and becoming increasingly relevant to researchers.
We proceed with a Thematic Map, the result of a bibliometric analysis designed to organize and visualize themes from a corpus of scientific literature.
Utilizing the Biblioshiny software, we crafted a thematic map (Figure 9), which seeks to organize and visualize themes from a body of scientific literature, categorizing research topics into four quadrants based on two dimensions: 'Degree of Development' (or Density) and 'Degree of Relevance' (or Centrality).

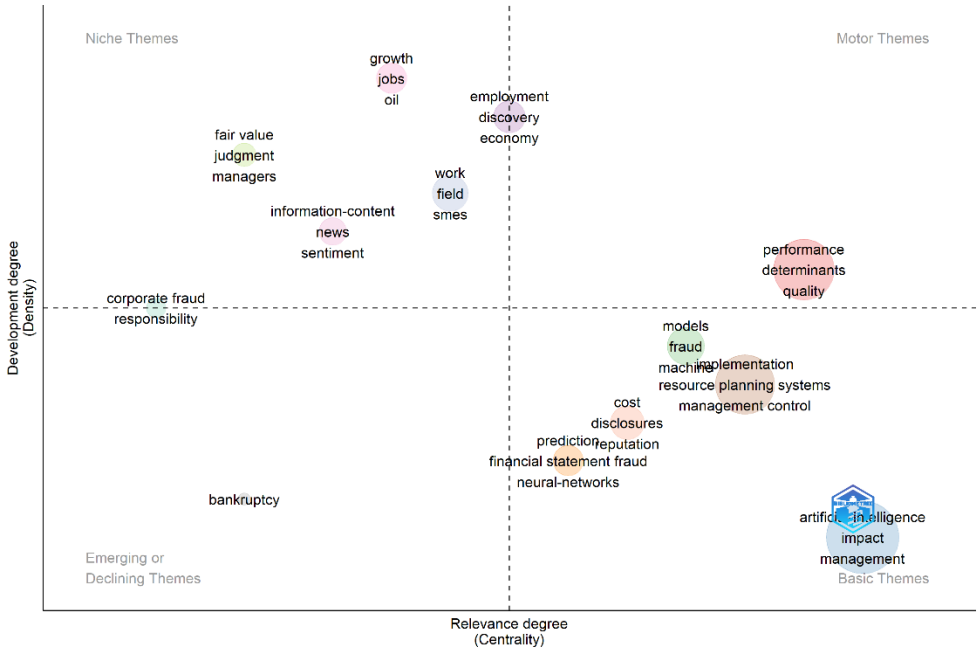


Figure 9: Thematic Map
Source: Authors own creation using Bibliometrix (Biblioshiny) , 2024

Within the niche themes category, keywords such as "fair value", "judgment" and "managers" are featured. These terms have been focal points in literature, centering on the fair valuation in financial reporting, the role of professional judgment in auditing, and the influence of artificial intelligence on managerial decisions. Although these topics have been thoroughly explored, they are considered niche because they do not constitute the core focus across the majority of work in the field.
In the Motor Themes category, terms like "models", "fraud" and "disclosures" represent dominant research themes that propel the discourse within this sphere. "Models" pertain to the development of accounting or audit models that are augmented by AI and ERP technologies, whereas "fraud" and "disclosures" are crucial for grasping how these technologies can facilitate fraud detection and enhance financial reporting transparency.
The keywords "resource planning systems" and "management control" within the basic themes segment establish the foundational dialogue regarding the impact of ERP and AI. Resource planning systems are indispensable for efficient business management, and management control is a fundamental tenet being reshaped by the advent of AI.
In the Emerging or Declining Themes section, terms like "corporate fraud" and "responsibility" are present. "Corporate fraud" may signal an increasing interest in leveraging artificial intelligence to prevent and detect fraud within the corporate realm, while "responsibility" could point to a burgeoning emphasis on the ethical and social responsibility of businesses in the era of advanced technology adoption. Placement closer to "Emerging" suggests a theme is gaining prominence; a shift towards "Declining" might indicate the current literature is distancing from these concerns.

5. Conclusion

The steady increase in publications reflects an accelerated adoption and integration of AI and ERP systems within the accounting and auditing sectors. This trend indicates that the field is rapidly evolving to incorporate these technologies, which are becoming crucial for modern financial practices. The peak in scholarly articles by 2023 suggests that significant

technological advancements in AI and ERP systems have been recognized as having profound impacts on efficiency, accuracy, and the overall effectiveness of accounting and auditing practices. These technologies facilitate automated processes, enhance data accuracy, and allow for real-time financial analysis, which are invaluable in today's fast-paced business environments.

The widespread geographic contribution highlights a global recognition of the importance of AI and ERP systems in reshaping accounting and auditing practices. Countries leading in research output are likely at the forefront of implementing advanced technological solutions in their financial sectors, influencing global standards and practices.

The interdisciplinary nature of the research signifies collaboration between technologists, accountants, auditors and academic researchers. This collaboration is essential for developing solutions that are not only technologically advanced but also aligned with the practical needs of the financial industry.

The proliferation of publications across a variety of journals, particularly in those like the "Journal of Emerging Technologies in Accounting" and the "International Journal of Accounting Information Systems" indicates a significant and growing academic interest in the intersection of AI and ERP systems with accounting and auditing practices. This suggests that these technologies are not only gaining traction but are also transforming traditional practices within these fields.

The identification of key contributors such as VASARHELYI MA, SUTTON SG, and ARNOLD V, who have extensively published on relevant themes, points to a concentrated effort by scholars to advance understanding and application of AI and ERP systems. Their work not only enriches the academic literature but also guides practical implementations and policy formulations in these fields.

The analysis of keyword frequency and co-occurrence highlights the transformative impact of emerging technologies like AI and ERP on accounting and auditing, revealing a focus on operational efficiencies, strategic management, interdisciplinary integration, and ethical governance, while also emphasizing the challenges and future research directions in implementing these technologies.

Tripartite graph illustrates a significant interconnectedness and collaboration within the academic community on ERP and AI in accounting and auditing, highlighting the influence of key authors like Vasarhelyi, Sutton, and Albu, and identifying central themes such as "erp", "artificial intelligence", "machine learning" and "big data", which underscore the deep impact and growing relevance of these technologies in shaping contemporary research and practices in the field.

The Thematic Map created using Biblioshiny software effectively organizes and categorizes key research topics within the field of accounting and auditing, illuminating how emerging technologies like AI and ERP are reshaping critical aspects of the discipline. This map reveals a structured analysis of thematic dimensions, showing that while niche themes like "fair value" and "judgment" continue to be explored, more dominant themes such as "models," "fraud," and "disclosures" are driving the academic discourse by demonstrating the practical applications of these technologies in enhancing transparency and efficiency. Furthermore, foundational themes involving "resource planning systems" and "management control" underscore the integral role of these technologies in modern business management, while emerging concerns like "corporate fraud" and "responsibility" highlight a growing focus on the ethical implications of technology in business practices. This analysis not only reflects the current landscape but also predicts future shifts in focus, indicating a dynamic field that is increasingly influenced by technological advancements.

The ongoing research interest points to the need for continued exploration into how AI and ERP systems can be further optimized for accounting and auditing. Future research could focus on the development of more sophisticated tools that can handle increasingly complex financial data, address emerging challenges such as cyber security in financial systems, and explore the ethical implications of automated financial decision-making.

With the rapid integration of AI and ERP systems into accounting and auditing, there is a growing demand for professionals who are not only skilled in traditional financial practices but also proficient in these new technologies. This shift necessitates changes in educational curricula and professional training programs to prepare the next generation of accountants and auditors. (Damerji and Salimi, 2021).
In summary, the integration of AI and ERP systems in accounting and auditing is not only a topic of academic interest but also a practical evolution that is reshaping the landscape of financial management and corporate governance. The contributions from diverse journals and leading scholars highlight the multifaceted impacts of these technologies, suggesting ongoing shifts in the practices, strategies, and ethical considerations within the professions.

6. Acknowledgements

This paper was co-financed by The Bucharest University of Economic Studies during the PhD program.

References

1. Berdiyeva, O.; Islam, M.U. and Saeedi, M. (2021), *Artificial Intelligence in Accounting and Finance: Meta-Analysis*, Nust Business Review, vol. 3 (01), pp. 56-79
2. Bibliometrix (2024), *Biblioshiny: the shiny app for bibliometrix*, [ONLINE] available at: https://www.bibliometrix.org/home/index.php/layout/bibliometrix, accessed on April 14, 2024
3. Damerji, H. and Salimi, A. (2021). *Mediating effect of use perceptions on technology readiness and adoption of artificial intelligence in accounting*. Accounting Education. 30. pp. 1-24. 10.1080/09639284.2021.1872035.
4. Ezenwa, E. and Nkem, U.H. (2021). *Impact of Artificial Intelligence (AI) on Accountancy Profession*, Journal of Accounting and Financial Management, E-ISSN 2504-8856, P-ISSN 2695-2211, Vol 7., No. 2, pp. 15-25
5. Hasan, A.R. (2022). *Artificial Intelligence (AI) in Accounting & Auditing: A Literature Review*, Open Journal of Business and Management, no. 10, ISSN Online: 2329-3292, pp. 440-465
6. Khamis, L.; Alasfoor, F.; Khawaja, N. and Abu Wadi, R. (2023). *Artificial Intelligence, ERP and Managerial Accounting*, Emerging Trends and Innovation in Business and Finance – Contributions to Management Science, pp. 779-791
7. Munoko, I.; Brown-Liburd, H. and Vasarhelyi, M. (2020). *The Ethical Implications of Using Artificial Intelligence in Auditing*, Journal of Business Ethics, vol. 167, pp. 209-234, https://doi.org/10.1007/s10551-019-04407-1
8. Solaimani, R.; Rashed, F.; Mohammed, S. and Wahid ElKelish, W. (2020). *The impact of artificial intelligence on corporate control*, Corporate Ownership & Control, vol. 17, no. 3, pp. 171-178
9. Srbinoska, D.S. and Donovska, S. (2023). *Automation of accounting processes: the impact of artificial intelligence and ERP systems on accounting*, Pregdni rad, pp. 87-108
10. Svitlana, K. and Olha, R. (2024). *Artificial intelligence in accounting*, Scientia Fructuosa, no. 2, ISSN 2786-7978, pp. 145-157
11. Zhang, Y.; Xiong, F.; Xie, Y.; Fan, X. and Gu, H. (2020). *The Impact of Artificial Intelligence and Blockchain on the Accounting Profession*, IEEE Access, vol. 8, pp. 110461-110477, DOI: 10.1109/ACCESS.2020.3000505

THE EVOLUTION OF THE PERFORMANCE CONCEPT – A BIBLIOMETRIC ANALYSIS

Anca-Giorgiana (BURTIC) BURESCU

Doctoral School of Economic Sciences, Faculty of Economic Sciences, University of Oradea, Romania
burtic.ancagiorgiana@student.uoradea.ro, anca.giorgiana91@yahoo.com

Abstract:
The main objective of the study is to research the evolution of the concept of performance, through the lens of definitions given since 1957 until today. Also, the research proposes a performance analysis from a general approach to a financial approach. Currently, a great significance is represented by the existing performance at the level of the companies, practically any company has as its goal the obtaining of profit, and within a profitable company we are talking about the performance of the companies. At the end of this article, I performed a bibliometric analysis that aimed to identify scientific works that address the theme of "the evolution of the concept of performance", using the VOS Viewer program. So, as we identified in the Web of Science Core Collection platform, by selecting the areas of interest Business Finance, Business, Economics and Management, a number of 697 articles written between 1999 and 2023 resulted. The importance of the theme began to grow starting with year 2007, and since 2010 it has been written constantly until now, but in 2020 the most articles were written on the analyzed topic. Depending on the country of origin of the published articles, most articles were published by researchers from the USA, followed by England, Spain, Italy and Romania. Finally, we analyzed the fields of journals in which the most articles on the chosen topic were published, and last but not least, we analyzed the network visualization for the co-occurrence of keywords.

Keywords: Performance concept evolution, bibliometric analysis, Web of Science Core Collection,VOSviewer.

JEL Classification: M41, M40, M21

1.Introduction

From the analysis of the specialized literature, it can be seen that there is no unified vision on the concept of performance, not even from the point of view of a general understanding, even more so from the financial point of view.
This study can be a starting point for researchers interested in the evolution of the concept of performance over time and implicitly in an analysis of the specialized literature. The objectives of the work are:

1. Presentation of the evolution of the concept of performance over time until now;
2. Carrying out a bibliometric analysis that aims to identify works from specialized literature.

It will be noted that in the last decades the interest of researchers and practitioners in studying the performance of companies and implicitly the indicators that measure performance has increased.
The bibliometric analysis proposes an identification of the scientific works that address the theme of "the evolution of the concept of performance". The methodology used in performing the bibliometric analysis and its interpretation was presented.

2. Evolution of the concept of performance. Review of specialized literature.

Jianu I. (2007) presented the origins of the word performance as being of Latin origin, but the meaning of cuvat comes from English. Similar words are "performare" in Latin, and "to perform" and "performance" in English. By the Latin word "performance" it can be understood to fully give form to a thing. The verb "to perform" in English means to do something regularly, to execute. For example, in concluding a contract, the moment of concluding the contract is important, but especially the execution of the contract. Another example could be the production of a company, since within the production there must be a certain continuity, both at the product level to get from the raw material to the final product, and at the company level where the performance exists if the production it is continuous and does not interrupt the activity. By the noun "performance" we can understand the achievement of something, an act or the way in which an organization achieves its objectives that have been proposed to it. For example, I believe that the goal of any company is to achieve performance, but to achieve this goal, it is important not only the final goal, but also the correct and efficient use of resources, correct management of expenses, labor productivity, quality management, marketing, etc.

As a general understanding, the term performance began to be used from the beginning of the 20th century in certain fields, reaching that nowadays the term is used in absolutely all fields. Gradually, the concept of performance began to be used in as many fields as possible, being used mainly in the economic field.

Some authors such as (Debiens, 1988; Burguignon, 1995, Lebas, 1995) approached a general understanding of the concept of performance. They defined performance as: "the level of achievement of objectives".

Other authors have defined performance in a more complex sense, thus moving to a financial sense. Jianu (2007) presents a series of definitions and performance assessment criteria given in the period 1957-1979:

- Bennis (1962) establishes the following criteria for assessing performance: adaptability, capacity, sensitivity.
- Caplow (1964) appreciates performance taking into account the following criteria: stability, achievement, integration.
- Katz and Kahn (1966), in turn, define performance at the level of an organization as maximizing the income that the enterprise can obtain using effective and efficient means, that is, economic and technical, but also with the help of political means. These authors evaluate performance according to the following criteria: survival, growth, environmental control.
- Yachtman and Seashore (1967) define performance as the company's ability to exploit the environment to acquire resources necessary for its operation. These authors believe that the criteria used to assess performance are: production costs, turnover, productivity.
- Friedlander and Pickle (1968) established the following criteria for assessing performance: employee satisfaction, profitability, company value.
- Mahoney and Weitzel (1969) defined performance taking into account efficient and productive action, and the criteria for assessing performance are: planning, trust, productivity, development, staff quality.
- Schein (1970) establishes the following criteria for assessing performance: creativity, communication, psychological commitment.
- Labrousse (1971) is known as one of the authors who gave a definition of enterprise performance. He argued that there is performance in the enterprise that knew how to place and exploit and that knew and knows a remarkable expansion; who knew how to face foreign competition; who knew how to measure his productive effort at the lowest costs, who knew how to maintain his own its expansion and which, through its industrial and managerial know-how, brings a real service to the community.
- Negandhi and Reiman (1973) consider the following criteria in assessing

performance: staff satisfaction, hiring new employees, staff stability, labor force utilization, net profit, sales growth.

- Harrisson (1974) defines performance as the end result of the application of effort.
- Child (1974) establishes the following criteria for assessing performance: profitability, growth.
- Shashua and Goldschmidt (1974) were the first to have brought to the fore a model of financial performance of the enterprise taking into account criteria such as: profitability shares, return on capital, profit margin, operating capital ratio, activity ratio. These indicators are indicators that measure the size of the company's performance. The first two indicators are indicators of profitability, which indicate the performance of the enterprise. The last three indicators are financial indicators that show that the company's position is the result of current and past performance.
- Klein (1976) appreciates the company's performance through: the increase in added value, the increase in immobilized assets, the return on capital employed, the coverage of operating needs from the working capital, the term debt relative to the self-financing capacity.
- Lorino (1995) defined performance as "everything that contributes to the improvement of the value-cost couple.
- Lungu (2006) kept the definition already given in 1995, when he defined performance as "everything that contributes to the improvement of the value-cost couple.
- Jianu (2006), Albu & Albu (2007), Mathews (2007) Danzinger (2007), defined performance as "creating wealth, value in the organization".

Lebas, (1995) gives the following definition "performance represents the set of elementary logical stages of action, from intention to result"

A. Bourguignon (2000) defines performance both at the level of an enterprise and at the individual level: "those who achieve their goals are successful"

J. M. Stern, J.S. Shiely and I. Ross (2001) define performance as "an unstable level of an enterprise's potential, obtained as a result of the optimization of the value-cost relationship and which makes the enterprise competitive in certain strategic sectors."According to Nicolae Felegă (2002), performance is defined by the users of accounting information according to the specific purpose of each one, and should not be sought only in the profit and loss account. Citing the opinion of Professor Feleaga, Professor Ion Stancu states "the name of financial performance identified by the profit and loss account is overbid"

According to E. Reynaud (2003), it defines the notion of the global performance of the enterprise which is given by the totality of the economic, social and environmental performances. This author states that performance appears as a result of the financial results obtained by the enterprise.

G. Lavalette and M. Niculescu (2003), defines performance as "achieving organizational objectives regardless of their nature and variety"

P. Lorino (2003) defines performance as "all that, and only that, contributes to the achievement of the strategic objectives" of the enterprise, as well as "all that, and only that, contributes to improving the value-cost couple, and not only what contributes to the reduction of the cost or the increase of the value"

According to Niculescu M. (2003) performance is based on the notion of comparison. In the economic field, there are a variety of definitions given to the concept of performance due to the fact that this concept is defined differently depending on the user performance information. Current and potential investors perceive their performance in terms of return on investment, of course managers are oriented to the overall performance of the organization they lead, employees perceive through performance the profitability and stability of the workplace and creditors show interest in the organization's stability. According to Niculescu M. (2003), performance measurement is "the process that

allows linking an abstract concept to empirical indicators". However, the perception of performance is different depending on the specific interests of each one. Performance measurement is a necessary condition to ensure the progress of an entity, but not a sufficient one. Progress that is not measured does not exist. But performance measurement makes success recurring as it generates action and sustainable development.

Nicolescu, O., Verboncu, I. (2007), define performance through the prism of the company's objectives, starting from the analysis of the company as a "group of people who carry out common activities aimed at achieving one or some objectives"

R. Tannenbaum and H. Shimdt (2009) define performance as "the degree to which an organization, as a social system, with certain resources and means, achieves its objectives"

Considering the development of the world economy, Alazard and Separi believe that performance must be seen as a global vision. Global performance includes economic, social and environmental aspects and, in this context, effectiveness and efficiency receive new dimensions, both quantitative and qualitative. For Reynaud (2003) and Baret (2006) global performance represents the aggregation of economic, social and environmental performance, and for Germain and Trebucq global performance is formed by the meeting of financial performance, social performance and societal performance.

So that currently global performance brings together the three pillars of the term sustainable development, namely: economic development, social development and environmental protection.

Jianu I. (2007) defines performance in terms of a state of competitiveness of the enterprise that ensures its sustainable presence on the market. Performance is an indicator that appears as a result of meeting strategic objectives. This author offers not only a definition for the concept of financial performance, but also the performing enterprise, which he defines as the enterprise that satisfies customers, creates value for shareholders, that takes into account the opinion of its employees and that respects the natural environment.

Siminică M. (2008:107) defines performance taking into account the degree to which an enterprise manages to satisfy the requirements of the internal environment and the external environment, through an optimal combination of effectiveness and efficiency.

According to Petrescu S. (2008), value creation at the company level is achieved when it obtains a return on the capital invested in assets higher than the cost of the resources mobilized to finance them.

Bătrâncea I. (2010:141) appreciates that the performance indicators must help to appreciate the economic value, the creation of value and the potential for future earnings.

Bugle Al. (2011) appreciate that once the performance is analyzed, assessments can be made on the formation of the results of the activity and on the correlation with its financial structure, liquidity and solvency.

In the view of Vasilescu L. (2015), indicators such as the rate of economic return on assets or net profit per share are used to measure performance in a large number of companies, although these indicators are not theoretically correlated with value creation. Thus, appropriate financial ratios should be used to reflect value creation as well as modern indicators within value creation management.

From the analysis of the definitions mentioned above, it can be noted that indeed the opinions regarding the definition of the concept of performance are very vast, however, the diversity of opinions is given by their evolution over time in society, against the background of technical-scientific revolutions and world economic globalization moving towards new cycles of economic development with no requirements in terms of reaching the performance levels of the economic entity.

The modern management of organizations is dominated by two concepts: performance and value.

Therefore, the modern management of organizations is dominated by two concepts: performance and value.

According to Petrescu S. (2013), in defining the concept of performance and the use of the

terms effectiveness, efficiency and economy, one will start from the presentation of the enterprise that consumes resources and creates goods and services in a systemic view based on the input-output relationship, corresponding to the phases supply-production-sale economic circuit.
According to Balteş N., Vasiu D. (2015), financial performance is frequently associated with the notions of maximization, efficiency, productivity or effect. In this concept, the assessment criteria of financial performance refer to productivity, flexibility, adaptability, capacity, sensitivity, achievement, growth, turnover, production costs, productivity, profitability, etc.

The definition of the concept of performance through the prism of some criteria can be found in table no.1
Table no. 1 – Defining the concept of performance through criteria

Author	Criteria by which performance is defined over different periods of time				
Niculescu M. (2003:49)	1960-1970	1970-1980	1980-1990	1990-2001	after 2001
	turnover, total assets	net profit, earnings per share, PER	liquidity, cash flow	profitability through cash flow of investments, economic added value, market added value	value creation
Nistor I. Pintea M.O., (2011)	1950 – 1980		1980 - 1990	1995 – 2000	after 2000
	productivity, adaptability, capacity, turnover, environmental control, production costs		the level of achievement of the objectives	the efficiency and effectiveness of the economic entity	value creation

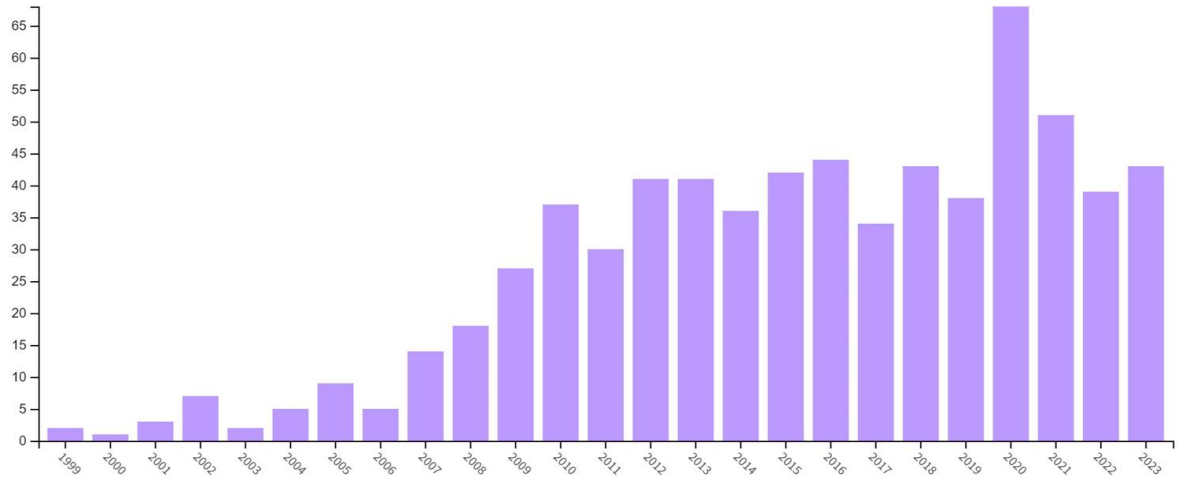
Source: own contribution

3. Bibliometric analysis on the Evolution of the concept of performance.
Bibliometric analysis can be performed using a database. To access the database, we used the Web of Science Core Collection platform
We carried out a bibliometric analysis of the specialized literature on the topic "evolution of the concept of performance" using the "all fields" search type.
In this sense, we performed the search for the keywords in the phrase "evolution of the concept of performance", the search being repeated in all the fields of the entire database, not being filtered by variants such as: topic, title, author, publication title, etc.
We applied a filter to the Web of Science Categories section, where we selected the following fields: Business Finance, Business, Economics and Management. The search for articles in the bibliometric data source was carried out on 21.03.2024. After applying this filter, a number of 706 articles resulted.
Another filter I selected was the year of publication, thus I chose to take into account all the articles in my analysis except those published this year, namely 2024, since it is the current year and it is not fair to interpret data from other years with data from the current year.
Following the search in the bibliometric data source applying the specified filtering, a number of 697 articles with the following keywords: "the evolution of the concept of performance" resulted. The 697 articles belong to one of the fields of Business Finance, Business, Economics and Management and are published starting from the first year in which articles were written on that topic and until 2023 inclusive.

3.1. Number of articles published per year on the topic "evolution of the concept of performance" using the search type "all fields"

In figure no. 1 it can be seen that most articles were written in 2020, which is the year in which the greatest research interest was registered on the topic "evolution of the concept of performance" using the "all fields" search type. At the opposite pole is the year 2000, the year in which the fewest articles on the analyzed topic were published. In conclusion, I could say that in the period 1999-2006 the number of published articles was quite small, and starting from 2007 the interest in publishing articles gradually increased, following that in the period 2010-2023 the number of published articles was more or less constant , and the peak being recorded in 2020.

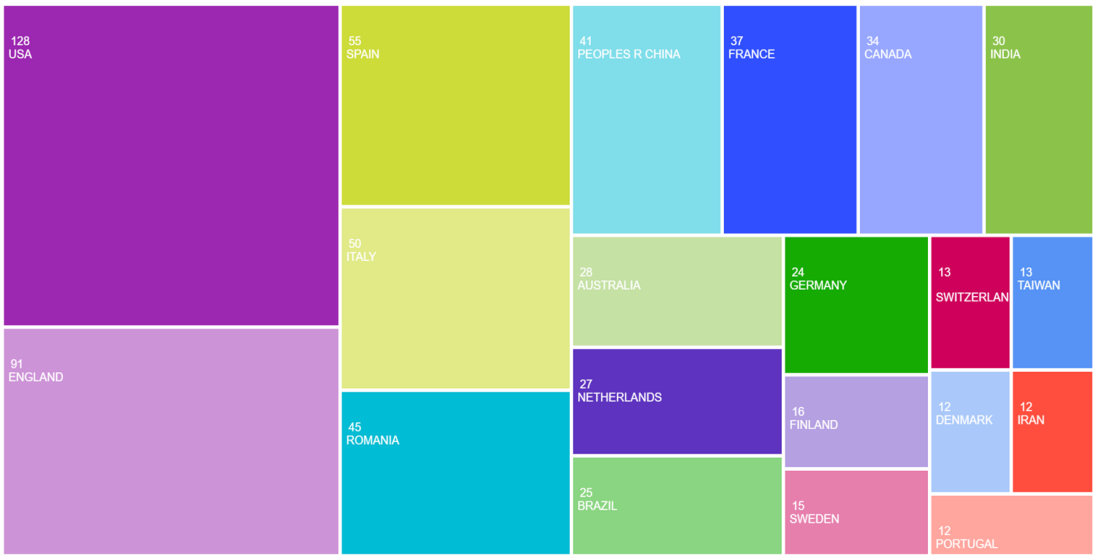
Figure no. 1- Number of articles published per year on the topic "evolution of the concept of performance" using the "all fields" search type.
Source: Web of Science Core Collection



3.2. Number of articles published on the topic "evolution of the concept of performance" using the search type "all fields", according to the country where the authors of the published articles come from

Most articles published on this topic were published by researchers from the USA (128 articles, i.e. 18,364%), followed by England (91 articles, i.e. 13,056%), then Spain (55 articles, i.e. 7,891%). then Italy (50 articles, i.e. 7,174%), then Romania (45 articles, i.e. 6,456%), then followed by other countries as can be seen from the graph attached below (graph containing the first 20 records out of a total of 78 records).

Figure no. 2 - Number of articles published on the topic "evolution of the concept of performance" using the "all fields" search type, depending on the country where the authors of the published articles come from



Source: Web of Science Core Collection

3.3. Classification according to the domain of the journal in which the articles were published.

Most articles were published in journals belonging to the field of Management (449 articles, i.e. 64.419%), then belonging to the field of Business (308 articles, i.e. 44.189%), then Economics (121 articles, i.e. 17.360, then the number of articles decreases significantly for articles in the other fields (Business Finance 38 articles, i.e. 5.452%). In conclusion, on the topic "performance concept evolution" using the "all fields" search type, most articles were published in journals belonging to the fields: Management, Business, Economics, Business Finance, with a much smaller number of articles being published in journals belonging to other fields.

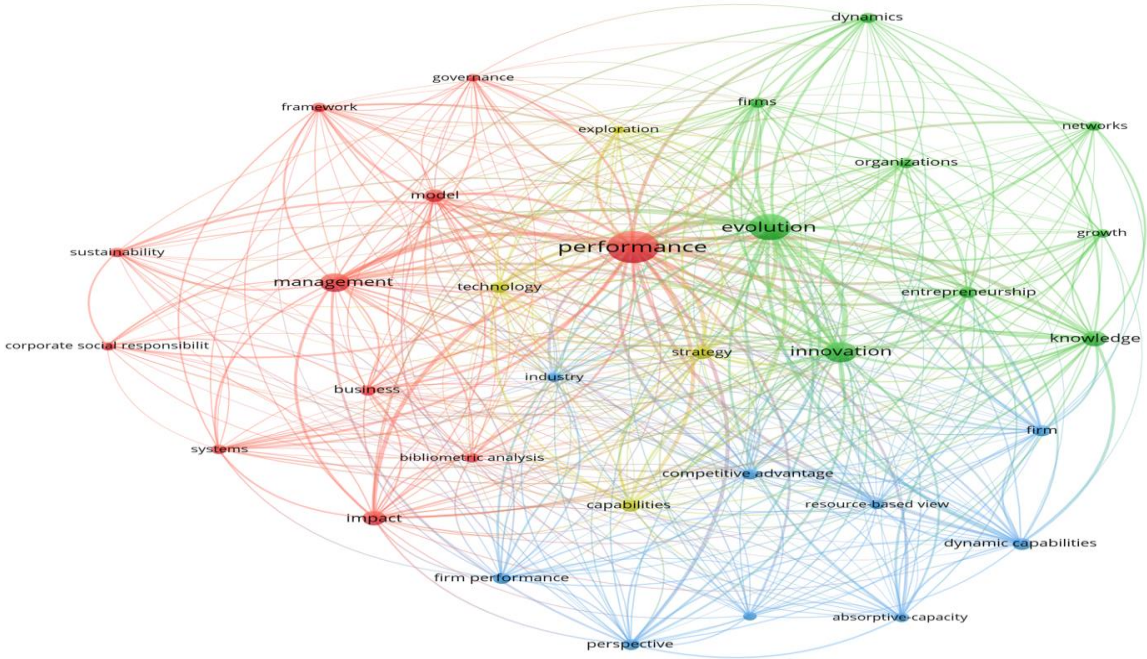
Figure 3 shows the visualization of the network for the co-occurrence of keywords using the program VOSviewer version 1.6.20. VOSviewer is a software used for the creation and visualization of bibliometric networks. In the analysis performed on the analyzed sample, we used the co-occurrence network for a minimum number of 20 occurrences of the keywords. From the first analysis of the network for co-occurrences, after the filters set above, it can be seen that 33 items were recorded, which were grouped into 4 clusters, which generated 455 connections, also generating a total strength of links of 2686. The keywords were grouped into 4 clusters, each cluster being represented by different colors.

The keywords grouped in cluster 1 are: bibliometric analysis, business, corporate social responsibility, framework, governance, impact, management, model, performance, sustainability, systems. In total cluster 1 of red color has 11 items (articles). The keywords grouped in cluster 2 are: dynamics, entrepreneurship, evolution, firms, growth, innovation, knowledge, networks, organizations. In total cluster 2 of green color has 9 items (articles).

The keywords grouped in cluster 3 are: absorptive capacity, competitive advantage, dynamic capabilities, firm, firm performance, industry, knowledge management, perspective, resource-based view. In total cluster 3 of blue color has 9 items (articles). The keywords grouped in cluster 4 are: capabilities, exploration, strategy, technology. In total cluster 4 of mustard yellow color has 4 items (items).

The keywords grouped in clusters can be viewed in figure no. 3.

Figure no. 3 – Correlation of keywords with the theme "performance concept evolution" – Network visualization for co-occurrence of keywords



Source: Web of Science Core Collection, own processing in VOSviewer version 1.6.20
The following results from figure no. 3:
Within cluster 1, links are formed from the keyword "performance" to terms such as: bibliometric analysis, business, corporate social responsibility, framework, governance, impact, management, model, performance, sustainability, systems. In order to reach the performance of a company, a correct risk management is needed, based on which there must be a sustainable development in conditions of social-corporate responsibility that leads to obtaining profit and automatically to the existence of a financial performance.
Within cluster 2, from the word "evolution" there are links to keywords such as: dynamics, entrepreneurship, evolution, companies, growth, innovation, knowledge, networks, organizations. From these links it can be seen that for a company to evolve it needs strong entrepreneurship, innovation, good organization and constant growth.
In cluster 3, links are created between keywords such as: absorptive capacity, competitive advantage, dynamic capabilities, firm, firm performance, industry, knowledge management, perspective, resource-based view. The links are also created here at the level of the word company, in which we must direct a good management, the necessary resources, knowledge, capabilities and a competitive environment.
At the level of cluster 4, links are created around the word strategy. About the same intensity is the creation of links around the words technology, exploration and capabilities. From these links between keywords it can be deduced that equally important is the strategy of a company, the technology that must advance, the continuous exploration as well as the ability to maintain the performance at the level of the company.

4. Conclusions

The specialized literature shows that there is no unified vision on the concept of performance, not even from the point of view of a general understanding, even more so from the financial point of view.
Taking into account the definition of the concept of performance over time, until the 80s

practitioners used performance assessment criteria, such as: productivity, adaptability, capacity, turnover, environmental control, production costs, etc. Between the 80s and the 90s, performance was defined according to the level of achievement of objectives. Between 1995 and 2000, performance was defined according to the efficiency and effectiveness of the economic entity. And, from the 2000s until now, performance is defined taking into account value creation.
Considering the development of the world economy, the conclusion was reached that performance must be seen as a global vision. So that currently global performance brings together the three pillars of the term sustainable development, namely: economic development, social development and environmental protection.
As future approaches absolutely necessary for the continuity of the analysis would be "performance measurement and analysis of the indicators that best reflect the economic performance", and not least the non-financial performance approach.
Regarding the bibliometric analysis, it was carried out on the specialized literature on the topic of "the evolution of the concept of performance" As we identified in the Web of Science Core Collection platform, selecting the areas of interest Business Finance, Business, Economics and Management, resulted a number of 697 articles written between 1999 and 2023. The importance of the topic began to grow starting from 2007, and starting from 2010 it was written constantly until now, but in 2020 the most articles were written on the analyzed topic. Depending on the country of origin of the published articles, most articles were published by researchers from the USA, followed by England, Spain, Italy and Romania.
By the domain of the journal in which the articles were published. Most articles were published in journals belonging to the field of Management (449 articles, i.e. 64.419%), then belonging to the field of Business (308 articles, i.e. 44.189%), then Economics (121 articles, i.e. 17.360, then the number of articles decreases significantly for articles in the other fields (Business Finance 38 articles, i.e. 5.452%). In conclusion, on the topic "performance concept evolution" using the "all fields" search type, most articles were published in journals belonging to the fields: Management, Business, Economics, Business Finance, with a much smaller number of articles being published in journals belonging to other fields.
The paper concludes with keyword co-occurrence network visualization, where the intensity of links between keywords was analyzed. From the analysis of the correlation of the key words with the theme "evolution of the concept of performance", the words that were most intensively found in the scientific documents result: performance, evolution, management, strategy. Around these keywords links are formed with other words, but not limited to: company, corporate social responsibility, productivity, adaptability, growth, innovation, knowledge, perspective, knowledge management, resources.

Reference

Achim, M.V. și Borlea, S.N, (2012) Analiza financiară a entităților economice, Editura RISOPRINT, Cluj-Napoca, pp. 265-267
Albu, N. și Albu, C. (2003), Instrumente de management al performanţeiǁ, vol.I Contabilitate de gestiune, Editura Economică, Bucureşti
Albu N. și Albu C. (2003). Instrumente de management al performanţeiǁ, vol.II Control de gestiune, Editura Economică, Bucureşti
Balteş, N. și Vasiu, D., (2015) Analiza performanţei financiare a entităţii economice, editura Universităţii “Lucian Blaga”, Sibiu, pp. 7
Baret, P. (2005) "Evaluation de la Performance Globale des Entreprises: Quind d'une approche .economique?", Colloque ADERSE, IAE Lyon, pp. 18-19
Bourguignon, A., (1995) "Peut-on definer la performance?ǁ, Revue française de comptabilité no. 269", pp. 61-66.
Bourguignon, A., (2000) “Performance et controle de gestion, Encyclopedie de Comptabilete”, p.934.
Debiens, J., "Comment augmenter la productivity dans le secteur public" Revue de gestion, 1988
Feleagă, N., Feleagă, L. și Bunea, Ş., (2002) Bazele contabilităţii, Ed. Economică, pag. 74, citat de Stancu, I. în Stancu, I, (2007) Finanțe. Pieţe financiare şi gestiunea portofoliului. Investiţii directe şi finanţarea lor. Analiza și gestiunea financiară financiară a întreprinderii. Ediţia a patra, Ed. Economică,

București, p. 719
Pintea, O.M.și Achim, M.V., „Performance – An evolving concept", Annals of University of Craiova - Economic Sciences Series, vol. 2(38), Cluj-Napoca, pp. 1-12
Reynaud, E., Développement durable et entreprise: vers une relation symbiotique‖, Journée AIMS, (2003) „Atelier développement durable ESSCA Angers", p.1-15.
Tannenbaum, R. and Shimdt, H., (2009) „How to choose a leadership pattern", Harvard Business Review, p.133.
Jianu I., (2006) Performanţa – o noţiune care se caută pentru a se regăsi. Ambiguitate şi claritate‖, Revista Contabilitatea, expertiza şi auditul afacerilor, nr. 5, Bucureşti, p. 18.
Jianu I., (2007) Evaluarea, prezentarea si analiza performantei intreprinderii. O abordare din prisma Standardelor Internationale de Raportare Financiara, Editura CECCAR, p.12
Lavalette G.and Niculescu M.,(1999) Les strategies de croissance, Editura d'Organization, Paris, p.228
Lebas, M., (1995) "Oui, il faut definir la performance‖", Revue Française de Comptabilité, Nr. 226
Lungu, I.C., (2006) Politici şi tratamente contabile privind evaluarea performanţei financiare a întreprinderii‖: teză de doctorat. Bucureşti, ASE.
Lorino, P., (1991) Strategic management control. La gestion par les activités, Ed. Dunod, Paris, p. 43
Lorino, P., (2003) Methodes et practice de la performance, Editura d'Organisation, p.130.
Niculescu, M., (2003) Diagnostic financiar, Vol. II, Editura Economică, București, p.44
Nicolescu, O.,și Verboncu, I., (2007) Fundamentele managementului organizaţiei, Ediţia a III-a, Editura Tribuna economică, Bucureşti, p.71.
Nistor I.și Pintea M.O., (2011)Teză de doctorat - Abordări financiare și non-financiare privind creșterea performanțelor entităților economice, Cluj-Napoca, p. 13
Petrescu S, (2008) Analiză şi diagnostic financiar-contabil, ghid teoretico-aplicativ, ed. CECCAR, Bucureşti, p. 280
Petrescu S. (2013), Performanţă şi risc în afaceri, Editura Universităţii „A.I.Cuza" Iaşi, p. 9.
Reynaud, E., (2003) Développement durable et entreprise : vers une relation symbiotique, Journée AIMS, Atelier Développement Durable, ESSCA Angers, p.15.
Stern, J.M., Shiely, J.S. and Ross, I., (2001) „The EVA challenge - implementing value-added change in an organization", Wiley Publishing, p.45.
Vasilescu L, (2011) "Evaluarea performanţei firmei pe baza indicatorilor financiari", Analele Univerităţii „Constantin Brâncuşi" din Târgu Jiu, Seria Economice, Nr. 3, p. 159

THE FISCAL CHALLENGES OF THE DIGITAL ECONOMY IN THE EUROPEAN UNION: A BIBLIOMETRIC ANALYSIS

Roxana CIORTIN GANGOȘ

Finance Department, Doctoral School of Economic Studies, University of Oradea, Oradea, Romania
ciortingangos.roxana@student.uoradea.ro

Abstract: *The digital age offers new opportunities for innovation and growth. From a fiscal point of view, it creates opportunities for tax administrations to reduce tax evasion. On the other hand, as business models change, there is international pressure on the tax system. The current rules were developed at the beginning of the 20th century for traditional companies that relied on the principle of corporate taxation where value was created. In the case of digital activities, physical presence is no longer a condition for the provision of services. There are two major questions: Where do we tax? In the case of a company with a low or even non-existent physical presence and what do we tax? in the context of a digital business plan based on knowledge, data and intangible assets. The digital economy is a challenge for all tax regimes, as its rapid development has led to the conclusion that international tax rules are not properly adapted. One objective currently pursued at EU level is to adapt Member States' tax systems to optimize them to meet the challenges of the digital era. The aim of this paper is to identify the model and the most effective instruments for charging the digital economy at the level of the European community, as well as the way in which the directives issued by the European Union manage to harmonize the fiscal policies of each member state for charging and regulating the digital economy. In order to achieve that, we performed a bibliometric analysis on the database Web of Science Core Collection, regarding our study research. This study was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) statement.*

Keywords: taxation; digital economy; digitalization; digital presence; fiscal policy; bibliometric

JEL classification: A13

Introduction

Although the journey of each tax administration is unique, the research of this topic show that successful digitalisation journeys typically go through three main stages. The first one is regarding the context analysis. This is critical as it helps ensure that the right opportunities and challenges for digitalisation are uncovered depending on a jurisdictions unique circumstances. This analysis will normally encompass factors external to the tax administration like compliance issues or digital adoption in society, as well as factors concerning the internal capability of the tax administration to address the opportunities and challenges. The second stage is the strategy development. Using the context analysis, the administration can develop a digitalisation strategy that will guide the rest of the journey. With a digitalisation strategy describing the overall vision and objectives for digitalisation, deliverables that will contribute to fulfilling the objectives, the timeline along which the deliverables should be realised, and the plan for financing the work, the administration can inspire and motivate stakeholders while also managing expectations about the scope and timing of benefits. The third stage is a successful project delivery. To fulfil the objectives of

the strategy, the administration will need to execute a set of strategy-aligned and coordinated digitalization projects. While successful project results partly hinge on adherence to the digitalization strategy, they also require a foundation of careful project preparation, including scoping, governance and mandate questions; flexible and professional project execution supported by top management; and thorough post-project follow-up of deliverables and benefits.

Literature review

The exponential development of information technologies and artificial intelligence applications generates significant changes in all areas of activity, but especially in the economy. Understanding new working tools and using them responsibly is becoming more difficult if serious efforts are not made from government structures to find solutions to the challenges of these phenomena. The phenomenon of digitalization and digital transformation is a natural consequence of them, producing changes both economically and legally. Digitalization requires new thinking in governance, management and legislation, which must be understood to avoid the pitfalls that any new phenomenon brings with it.
Agrawal, D. R., & Fox, W. F. (2021) establish the fact that the technological changes that induce new consumption patterns promise new challenges for fiscal authorities. Critical challenges for the next decades include limiting administrative and compliance costs of enforcing taxes in a digital world, determining filing thresholds, dealing with online marketplaces and facilitators, and taxing the consumption of digital services from two-sided platforms. With respect to digital services, we discuss whether consumption taxes should be imposed on both monetized platforms and nonmonetized platforms, such as social media, and the mechanisms for doing so.
The research results of Strauss, H., Fawcett, T., Schutte, D. (2020), reflect major discrepancies in the level of response and sophistication of tax administration systems that have been implemented among tax authorities globally. Furthermore, none of the participating tax authorities' tax administration systems currently reflect an optimised tax administration system, as defined, within the digitalised economy.
In the analysis of digitalization as a complex phenomenon and its evolutions, it was established that it produces effects at the economic level, digitalization being present in the analyses of global governance, being in fact the main vehicle through which globalization makes its effects felt at the economic and social level.Digitization has practically encompassed all sectors of economic activity. Differentiation is more related to the degree of penetration and the complexity of the digitization elements present, many of which are now intrinsic to the productive processes at the level of economies. Hence the effects and the sectoral impact is different.
Geringer, S. (2020) shows in her research the fact that so far, there has been no consensus regarding the fair taxation of the digital economy at the international and EU level. As European policymakers have begun to experience noticeable amounts of pressure to act, several EU countries have pushed forward and introduced unilateral measures to ensure they receive a fair share of the tax revenues pie. However, it is unclear whether national digital taxes can overcome the tax challenges stemming from the increasing digitalization of the economy.
Schon, W., (2019) said that over the years, a number of approaches have been discussed, including far-reaching proposals to fully or partially re-allocate taxing rights to market countries. In recent months, three options have emerged at the level of the Inclusive Framework/OECD: international taxation on the basis of significant market presence, taxation according to the value of user contributions and profit allocation to marketing intangibles.

The most apparent effect of digitalization is an overall increase in economic efficiency, although it is very important to take into account its different territorial impact at EU level, depending on the degree of development of the economies of the member countries, their productive specialization, and the technological capacity. In general, smaller economies are increasingly marginalised value-added chains being affected by significant losses in skilled labour. The leap that these economies are making from a structure oriented towards the primary sectors directly to the economy centered on tertiary sectors, is making them vulnerable, vulnerable, this leads to an increase in the volatility of the economic cycle and a lower resistance to shocks that are freely propagated on the EU market, including, and especially as a result of the trading facilities of the factors of production, based on digital technologies.
Following the analysis performed on a case, Pohrebniak S., (2022), said that the levels of digitalization and its legal regulation in different countries are significantly different. According to the degree and success of digitalization, four groups can be distinguished: leaders who are slowing down, promising, and lagging. The peculiarity of those slowing down is that these are states with mature digital systems, but a low rate of further development, which are ready to sacrifice growth rates in the name of responsible, inclusive, and high-quality development.
Digitalization has a clear effect on the forms and patterns of organisation of economies and companies operating within the EU, with greater possibilities to decentralize their activities and at the same time organize more efficiently and create a digital strategy .

Taxation of the digital economy

The main source of the deficiencies of the digital economy taxation is that tax rules are created for companies with a physical presence, which is often the basis of the right to tax a company's profits exercised by a state. In the case of digital companies, they create surplus value from the online environment without having a physical presence in the source state. The effect is not taxing their profits or possibly not taxing them in the right state. This has led to the EU's intention to introduce a fair charging system for all companies, regardless of their size or whether they are active in the digital economy or not. Moreover, another feature is that the revenues generated by these digital enterprises are mainly from intangible assets that are difficult to assess, which also leads to their non-taxation. The current socio-economic context calls for particular attention to be paid to digitalization and the growth of its related economic performance.
In the context of insufficient digital legislation, the EU discussed the creation of necessary measures to build a successful digital economy:

- Taxation of EU-wide profits from the digital economy;
- Developing plans for digital innovation to enable Europe to cope with development and become a digital leader;
- The need to change tax rules at EU level and adapt their tax systems to ensure that digitally generated profits in the European Union are taxed where value is created;
- The need to create an efficient and fair tax system for the digital age, leading to the fair payment of taxes by companies and ensuring conditions for action at EU level in line with those adopted by the OECD and other international partners;
- Agree on a tax policy response to the challenges of direct taxation of the digital economy at EU level, as well as the need to adopt a unanimously accepted definition of the permanent establishment and the associated transfer pricing and profit allocation rules;
- Highlighting the principle of fiscal neutrality, according to which fiscal policy choices and tax rules should provide for a similar treatment for comparable situations, at member state level the importance of different data, including user data, for value creation by the digital economy in generating profits, and the need to consider and

assess the role of data in the context of transfer pricing and profit attribution rules, is reiterated.

The EU discussed how digitalisation affects the areas of the tax system, providing tax authorities with new tools materialized by improving services to taxpayers, increasing the efficiency of tax collection and detecting tax evasion, concluding an interim report, among the measures pursued being:

- A coherent and concurrent review of the rules of nexus (where we charge) and profit allocation, fundamental concepts of the allocation of tax rights between jurisdictions and the determination of the relevant share of the profits of the multinational enterprise that will be subject to taxation in a given jurisdiction;
- The adoption of a provisional measure in the form of an excise duty applied by the state in which certain electronic services are provided on the gross consideration paid for the provision of these services (proposal which is opposed by some states);
- Follow up on the progress made in implementing european directives with observed effects in the case of multinational companies that have reorganized themselves from a tax point of view to better align with their economic operations.

The European Council proposed a directive laying down rules for the taxation of companies in the event of a substantial digital presence, introducing the notion of substantial digital presence for the purpose of establishing the existence of a permanent establishment and criteria for determining the fingerprint, such as revenues from the provision of digital services, by the number of users of such services or by the number of contracts for a digital service. Thus, profits attributable to a substantial digital presence in a Member State are determined on the basis of a functional analysis and will be imposed in it under the national corporate tax framework. To this end, the economically significant activities carried out by the substantial digital presence relevant to the development, improvement, maintenance, protection and exploitation of the company's intangible assets must be identified, such as: collection, storage, processing, analysis, use and sale of user-level data; collection, storage, processing and display of user-generated content; the sale of online advertising space; making third-party content available on a digital market; the provision of any other digital service not listed above. These provisions apply to entities resident in the EU or in a third country, in the latter case a double taxation convention with provisions similar to those in the Directive relating to significant presence and attributable profits is mandatory. Another proposal of the European Council was regarding a Digital Services tax (DST) Directive as a simple interim solution for taxing digital activities in the EU. FDI constitutes a tax on revenue from the provision of certain digital services. The specific objective is to adopt a measure that is easy to implement, to be applied on a temporary basis, pending the establishment of a comprehensive solution.it is aligned with the general objectives, which envisage, protecting the integrity of the Single market ensures its good functioning, ensuring social fairness and a level playing field for all companies operating in the EU and tackling aggressive tax planning by closing gaps that currently exist in EU Member State rules that allow digital companies to circumvent taxation in countries in they are doing business and creating value.

With regard to the concept of digital permanent establishment, a second variant developed, but this time, by the European Commission, which takes into account precisely the problems related to the implementation of a long-term European approach, i.e. the short-term one, has been established as an alternative; this implies a tax on income/turnover where the value is created, it is intended that this tax is due only by groups with global turnover above a certain ceiling (750 million euros, currently proposed) and they have their digital footprint translated into revenues in the EU worth 10-20 million euros. The digital fingerprint will be used to calculate the tax rights for each Member State. Basically, depending on certain information that will be requested from companies, this information will consist, in the case of activities in which data about users is used or through the virtual advertising space (e.g. facebook, google, twitter, instagram, etc.), statistical - geographical information relating to those who

use the information, or, for services provided for a fee on different digital platforms/markets (brokerage services such as airbnb, uber), tax will be paid in the countries where those who pay for the services are resident. Turnover taxation has clear disadvantages for certain categories of companies, usually those with low margins, lost or in development through investments. The changes are very broad and tend to extend European attributions in the area of indirect taxes in the area of direct taxes. After all, if the direction will be taxation through the short-term option, member States should position themselves according to their own interests and express a point of view on the Commission's technical proposal to analyse the implications beyond fiscal policy intentions already taken at EU level.

Bibliometric benchmarks in shaping the fiscal challenges of the digital economy

The paper also points out the main techniques correlated to bibliometric analysis, namely: citation analysis, co-citation analysis, bibliographic coupling, co-word analysis, co-authoring analysis, total publications, total publications, number of authors contributing to the research, publications with sole author, publications made in partnership, number of active years per publication, total number of citations, media citation.
The theoretical aspects related to taxation are harmoniously complemented by the bibliometric analysis of its challenges in the digital economy. The fundamental objective of this bibliometric analysis on the concept of taxation in the digital economy was to map the phenomenon in order to outline an overview of it in order to highlight the research flows and its historical development.
In relation to the annual scientific production, the rate of growth of research interest shows a positive trend with the passage of time. One of the most relevant sources of publication of documents related to the aspect of tax research in the digital economy is the Web of Science Core Collection. This study was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) statement.

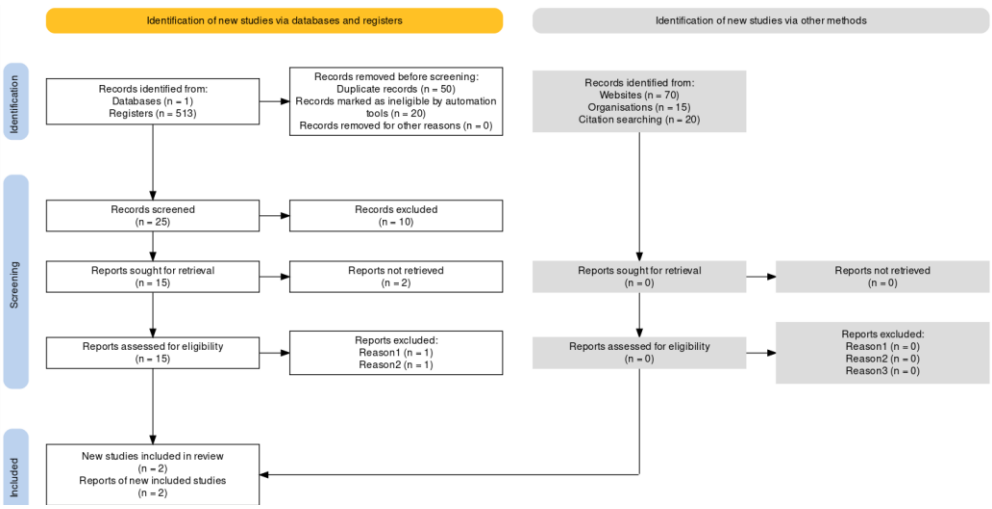


Figure 1: PRISMA Bibliometric Analysis on database Web of Science Core Collection
Source: Data processed with https://estech.shinyapps.io/prisma_flowdiagram/

Study search

To identify the 20 top-cited systematic review/meta-analysis studies in the field of the fiscal challenges of the digital economy, we performed a search of the Web of Science Core Collection on April 12th, 2024. The search strategy was as follows: the fiscal challenges of the digital economy, or digital economy, or fiscal challenges, or systematic review, or meta-

analysis. The search results were ranked by the number of citations, and the 20 top-cited studies were identified according to the number of citations.

Inclusion and exclusion criteria

We included all studies that were systematic reviews or meta-analyses pertaining to the fiscal challenges of the digital economy. We excluded studies that were corrections of previous studies and studies that only mentioned terms related to the fiscal challenges of the digital economy but did not concentrate our theme.

Data extraction and analysis

The following information was collected: number of total citations, number of citations in 2024, average citations per year, corresponding author's institution and country, journal, publication year, and number of references. If a corresponding author had more than one institution, the first institution was selected for analysis.

Results

The main characteristics of the 20 top-cited studies are shown in the study. The number of citations of the 20 top-cited studies varied from 7 to 487, with a total citation count 3250. The 20 top-cited systematic reviews/meta-analyses were published between 2001 and 2024. The year with the most studies was 2022, with 49 studies. Most of the studies had between two and six authors, studies with two authors were the most common. The 20 top-cited studies came from 10 countries (Russia, China, Spain, England, Germany, Romania, Brazil, France, USA, India), Russia had the most top-cited studies.
Bibliometric analyses enable readers to gain insight into the history and development of a specific specialty. Identifying the classic citations could help us catch the emerging themes and future trends for a particular discipline. From 2001 to the present, the field of digital economy has been developing for nearly twenty five years, but we did not find any bibliometric analyses in the field of the fiscal challenges of the digital economy. As systematic reviews/analyses always aim to synthesise data of the latest, high-quality original studies that are similar to provide more reliable results and are always regularly updated, we performed this study to identify the 20 top-cited systematic reviews/meta-analyses and to analyse the main characteristics of them.

Limitations

This study has several limitations. First, we only included studies from the Web of Science Core Collection, so there may be some that we were missed. Thus, the results of this study should be carefully interpreted. Second, many factors may affect the number of citations for a given study, such as number of years since publication, journal of publication, original language, institution and the reputation of the author. Furthermore, we did not analyse self-citations and citations in lectures and textbooks.

Conclusion

In conclusion, this study is the first bibliometric study to identify the 20 top-cited systematic reviews/meta-analyses in the field of the fiscal challenges of the digital economy. This study analyses the main characteristics of the most cited studies. Since systematic reviews/meta-analyses always synthesise and analyse a series of similar and latest original studies, we

analysed the most-cited systematic reviews/meta-analyses that might have a stronger impact on future practice and research work.
The European tax system needs tax reform to address the digitalisation of the European economy. Unilateral measures raise problems in terms of their compatibility with national laws, but also with European rules on the avoidance of double taxation. Their existence can have adverse consequences in the sense that they can generate a variety of rules in the context of a European Single market.
A reinterpretation of the classic concept of permanent establishment is needed to make a real link between where digital profits are earned and where they are taxed.
In defining, the main focus of the study was to identify how modern paradigms affect the field of digital economy, thus generating changes with a remarkable impact on taxation. Thus, the aspects dealt with in the work are summarized in the importance and role of reflecting the indispensability of digital technologies in the economic and business environment as well as in the fiscal one.
Following the study carried out in relation to the data collected and used in the analysis of the approached subject, it was found that, taking into account the EU strategy for the digital single market, that it paved the way for closer digital harmonisation between the EU member states. Launched in 2015, it aims to contribute to the economic growth of competition, innovation and investment.

References

Agrawal D. R., Fox W. F. (2021), Taxing Goods and Services in a Digital Era. National Tax Journal, vol. 74(1), pp. 257–301.
Beck K.,(2012) Globalization: Reproduction and Resistance in the Internationalization of Higher Education Canadian Journal of Education, vol. 35, no. 3, pp. 133-148.
Ggorshkova L.V., (2022), *Is a digital product a product or a service?* Report at the VII International Conference Law and the Internet. URL: http:// moglobi.ru/stati/cifrovojtovar-tovar-ili-usluga/main.html.
Klein, D., Ludwig, C.A., Spengel, C.,(2020), Taxing the digital economy: Investors reaction to the European Commission's digital tax proposals, National Tax Journal, volume 75, pp 61-92.
Kravchenko O. et al, (2019), *The digitalization as a global trend and growth factor of the modern economy,* SHS Web Conf., 65, p. 7004.
Nesterenko E.V. (2019), Digital services: concept, types, features. Theoretical economics, vol. 7, pp. 76.
Strauss H., Fawcett T., Schutte D., (2020), An evaluation of the digital response of tax authorities to optimise tax administration within the digitalised economy, E journal of tax research, volume18, pp. 382-401.
Williams K., Chatterjee S., Rossi M. (2008), *Design of emerging digital services: a taxonomy.* In: European Journal of Information Systems, vol. 17(5), pp. 505-517.
Base Erosion and Profit Shifting Project Public Consultation Document Addressing the tax challenges of the digitalisation of the economy (13 February – 6 March 2019). https://www.oecd.org/tax/beps/public-consultation-document-addressing-the-tax-challenges-of-the-digitalisation-of-the-economy.pdf.
E-government http://www.egov4dev.org/success/definitions.html.
OECD:https://www.oecd.org/countries/romania/public-governance-review-scan-romania.pdf.