VISUALIZING HUMANS CONTRIBUTIONS TO TAX COMPLIANCE RESEARCH: A BIBLIOMETRIC ANALYSIS

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Abstract. Understanding the factors influencing taxpayer compliance with tax laws continues to be a focal point for many researchers. This study presents a bibliometric and visual analysis of tax compliance, particularly focusing on the research clusters related to tax compliance, covering studies published between 1977 and 2024 and indexed in the Dimensions database. The analysis aims to provide insights and guidance for future research in the field of tax compliance. A total of 500 studies on Tax Compliance were identified in the Dimensions database, with the majority being articles published in international journals. Australia, Austria, Canada, Italy, and the United States emerged as the most productive countries in terms of Tax Compliance publications. Additionally, a notable trend is the increasing number of multidisciplinary studies conducted by authors from various countries, particularly concerning human factors. This study recommends exploring multiple databases and refining future research through several clusters identified from these findings. Thus, researchers can gain a more comprehensive understanding of the complexity of Tax Compliance and the various clusters influencing it. The bibliometric mapping and visualization of Tax Compliance provide a foundation for advancing knowledge and promoting informed investigations in the field of human behavior regarding tax compliance.

Keywords: Tax Compliance, Bibliometric Analysis, Research Clusters

INTRODUCTION

Tax compliance remains a challenge and a major source of revenue for countries worldwide (Santoro, 2021), as many nations rely heavily on tax revenue to support economic recovery (Kolluru et al., 2021). Governments need to develop comprehensive and sustainable strategies to address these challenges (Mascagni, 2022). They should also adopt a more humane approach in handling tax violations (Feld & Frey, 2002); (Siglé, 2022). Rather than relying solely on harsh penalties, softer approaches such as counseling and negotiation can help taxpayers in difficulty return to compliance without feeling intimidated (Paleka, 2023a). The combining these strategies, it is hoped that a fairer, more efficient, and inclusive tax system can be created. Improving tax compliance is not just about increasing government revenue but also about building trust and cooperation between the government and the public to achieve mutual development goals.

Psychological aspects such as gender also play an important role in tax compliance behavior (Taing & Chang, 2021). This influence is not universal and can vary depending on cultural context, gender, and educational level (Paleka, 2023b). Ongoing tax education is crucial, as enhancing public understanding of the importance of taxes and their benefits for national development is expected to increase awareness and willingness to pay taxes (Hamid et al., 2022). These educational programs can include outreach through media, seminars, and training for taxpayers (Aondo, 2020); (Nimer, 2022); (Trawule, 2022). Understanding how these factors affect tax compliance not only provides insight into tax behavior but also helps in designing more effective and inclusive tax policies to improve overall tax compliance levels.

Initially, these studies largely focused on developed countries with more structured tax systems (Thaçi & Gërxtaliu, 2018). Factors such as law enforcement, penalties, and taxpayer behavior were the main focus of these studies (Rosid & Romadhaniah, 2023). Over time, the scope of research expanded to include developing countries facing unique challenges, such as suboptimal waste management (Mpofu, 2022). Comparative studies between countries began to emerge, exploring how ethnicity, tax policies, and pandemic handling policies affect tax compliance (Saechang et al., 2021). The COVID-19 pandemic has underscored the importance of effective crisis management policies, as governments worldwide rely heavily on tax revenue to fund relief and economic recovery efforts.

Taxation is a critical revenue source that significantly bolsters the economies of countries globally (Swank, 1998); (Bräutigam, 2008); (Abigail, 2022); (Liu et al., 2024). Governments rely on taxes to finance various national expenditures, making taxpayer compliance essential for optimizing tax revenue (Martínez et al., 2023). Despite its importance, tax compliance
remains a persistent challenge for many nations (Abdu & Adem, 2023). The COVID-19 pandemic has further underscored the necessity of tax compliance, as governments worldwide depend heavily on tax revenue to fund relief efforts and stimulate economic recovery (Athira & Ramesh, 2023). Consequently, enhancing taxpayer compliance is pivotal for achieving revenue targets and ensuring fiscal stability. Psychological factors and differing social values between genders also play a crucial role in influencing tax compliance behavior (Seno, 2022). However, the impact of gender is not universal and varies depending on cultural contexts, tax systems, and levels of education (Alidu, 2023). Understanding how gender influences taxpayer compliance not only provides deeper insights into tax behavior but also assists in designing more effective and inclusive tax policies aimed at improving overall compliance rates (López-Luzuriaga & Scartascini, 2023). This knowledge is invaluable for policymakers striving to develop strategies that address the unique compliance behaviors exhibited by different genders.

Research on tax compliance has made significant strides across various countries (Tekin & Sokmen, 2023). Initially, these studies predominantly focused on developed nations with advanced tax systems, examining factors such as law enforcement (Bruno, 2019), penalties (Swistak, 2016) and taxpayer behavior (Alm et al., 2010). Over time, the scope of research has expanded to include developing countries, which face unique challenges like informal economies and limited administrative capacities (Nkundabanyanga et al., 2017). Comparative studies have emerged, exploring how different cultural, economic, and regulatory environments impact tax compliance (Narayen, 2023). Recent technological advancements and data analysis techniques have revolutionized the field, enabling more sophisticated analyses and insights. Despite these advancements, significant gaps remain, particularly in understanding the role of gender in shaping tax compliance across diverse contexts.

To date, the majority of tax compliance research has utilized quantitative (Modugu & Anyaduba, 2014) and qualitative approaches (Monageng, 2023), with few studies employing literature reviews. Researchers have often focused on quantitative analysis in tax compliance studies. Additionally, the increased emphasis on tax compliance has led to a rise in bibliometric and visual analytics studies, though these remain underdeveloped, especially regarding gender issues. Efforts to map the academic landscape of tax compliance research have revealed significant geographical and thematic gaps. High-income countries continue to dominate research outputs, leading to a dearth of studies in low- and middle-income countries, which often struggle with higher non-compliance rates (Hofmann et al., 2017). This geographic imbalance highlights the need for more inclusive research that addresses the unique challenges faced by lower-income nations.
The relationship between gender and taxpayer compliance has become a critical focus in economic and tax research due to the influence of various demographic factors, including gender, on compliance behavior. Previous research indicates that women tend to be more compliant in fulfilling taxpayer compliance than men (Damayanti & Supramono, 2019). This difference may be attributed to varying risk perceptions, with women generally being more risk-averse and more likely to adhere to rules to avoid negative consequences (Nelson, 2015). Additionally, social roles and family responsibilities more frequently borne by women may contribute to higher compliance levels (Deshpande & Kabeer, 2024). However, the relationship between gender and tax compliance is not uniform across all settings, as it is influenced by factors such as education, tax awareness, and the prevailing tax system in each country (Uddin et al., 2021).

Research on clusters regarding taxpayer compliance can provide a strong foundation for developing more responsive and fair tax policies. In the long run, strategies that combine various approaches are expected to result in a more adaptive and responsive tax system to social, economic, and technological changes. For example, by continuously monitoring developments in the digital economy, the government can develop tax policies relevant to the digitalization era, thus avoiding potential revenue loss from rapidly growing sectors such as e-commerce and digital services. Therefore, achieving optimal tax compliance requires holistic and sustainable efforts. A combination of technology usage, participatory approaches, tax education and literacy, institutional strengthening, incentives, and international cooperation are key to creating a fair, efficient, and responsive tax system. With the right strategy, the government can not only increase state revenue but also build trust and cooperation with the public, thus collectively achieving sustainable and inclusive development goals.

**Theoretical Framework and Hypothesis Development**

The theoretical framework of this research is rooted in several key theories in taxation and behavior. One relevant theory is Equity Theory, which emphasizes the importance of taxpayers’ perception of fairness and honesty in the tax system (Kim, 2002); (Inyang et al., 2021). According to this theory, taxpayers tend to be more compliant if they feel that the tax system is fair and that the benefits they receive are proportional to the tax contributions they make (Hassan, 2021). The Theory of Planned Behavior (TPB) is also relevant, as it highlights how attitudes, subjective norms, and perceived behavioral control influence taxpayers' intentions and actions (Hamdah et al., 2020). In this context, effective tax education programs and a
humane approach to tax enforcement can strengthen positive attitudes toward tax compliance, alter social norms, and enhance taxpayers’ perceived behavioral control.

Hypotheses developed from this theoretical framework involve several key aspects. First, based on the equity theory, it is hypothesized that "a humane approach to tax enforcement increases taxpayer compliance" by enhancing perceptions of fairness (O’Shaughnessy, 2014); (Prastiwi & Diamastuti, 2023). Second, referring to the theory of planned behavior, another hypothesis proposed is that "continuous tax education significantly increases taxpayer awareness and compliance" through changes in attitudes and social norms (Thaçi & Gërxhaliiu, 2018). Finally, the hypotheses that "a participatory approach in tax policy development will increase taxpayer trust and compliance" and "psychological factors such as gender and cultural context significantly influence tax compliance behavior" are rooted in sociological and psychological theories that show how participation and demographic factors influence individual behavior.

**METHOD**

This research uses bibliometric analysis methods to summarize data related to tax compliance, which is a type of literature study. Bibliometric analysis allows researchers to identify publication patterns, research trends, and scientific collaboration in a particular field. The data used in this study were obtained from the Dimensions database on May 20, 2024, at 10:00 WIB. Dimensions was chosen as the primary data source because it includes quality articles from leading publishers worldwide, ensuring a broad and in-depth representation of relevant research. The first step in this method is data collection from the Dimensions database. All studies relevant to the topic of tax compliance published between 1977 and 2024 were identified and extracted. A total of 500 studies were identified, covering various types of publications such as journal articles. Once the data were collected, bibliometric analysis was conducted with the following steps:

- **Network analysis:** using network analysis software like VOSviewer, the collaboration network between authors, institutions, and countries will be analyzed (Bukar et al., 2023). This visualization helps in understanding the relationships and cooperation within the scientific community related to tax compliance.
- **Cluster identification:** through co-citation and bibliographic coupling analysis methods, research clusters are identified to find the main themes and subtopics in tax compliance research (Pinzon & Iyengar, 2012). Each cluster will be analyzed to understand the research focus and thematic developments.
Multidisciplinary trend analysis: multidisciplinary trends in tax compliance research will be analyzed (Pinzon & Iyengar, 2012), particularly concerning the role of human factors. This includes the influence of psychology, sociology, and economics on tax compliance.

Using this method, the research aims to provide a comprehensive understanding of the academic landscape of tax compliance research and identify areas that require further exploration. The resulting bibliometric mapping and visualization will provide a foundation for advancing knowledge and promoting more informed investigations in the field of human behavior regarding tax compliance.

RESULTS

Statistics on Year of Publication

The R Studio analysis conducted by the researcher yielded several insights. From 1977 to 2024, a total of 1,549 authors were indexed in the Dimensions database, contributing to 500 published articles on tax compliance. The number of articles has gradually increased over the years. In 2015, only 19 articles were published, whereas in 2022 there were 87 articles, and in 2023 there were 66 articles, marking a four-fold increase. The statistical analysis of publication frequencies each year indicates a strong interest among authors in the topic of tax compliance, particularly in the past two years. There is a significant trend in publications and citations in the Dimensions database. Annual analysis shows a notable increase of 5.43% in publications each year, with an average of 8.45 publications per year. This suggests that research themes between 2015 and 2024 have significantly contributed to tax compliance studies. The figure illustrates the publication trends in tax compliance research from 1977 to 2024. The results presented here indicate an overall increasing trend in publications related to tax compliance.
To explore the topic of tax compliance and determine the content that captivates researchers, the author examined the keywords frequently appearing in various publications. Among the 1,157 identified keywords, those appearing 40 times or more were selected for detailed analysis, resulting in five such keywords. The evaluation of these keywords was conducted using RStudio software, based on their frequency of occurrence and total link strength. Table 1 displays the group of keywords that appeared 40 times or more. The keyword "Humans" was the most frequent, appearing 278 times (24%), followed by "United States" with 116 occurrences, "Female" with 52 occurrences, and "Male" with 43 occurrences.
To explore collaboration trends in tax compliance research, this study analyzed co-authorship relationships among individual authors and across organizations. According to (Chen et al., 2019), their analysis results aided in enhancing understanding of collaboration dynamics and identifying influential researchers. From 1977 to 2024, a total of 1,549 authors participated in writing on tax compliance topics. Among them, 10 authors appeared 9 times or more, as shown in Table 2. Author Erick Kirchler emerged as the most prolific author with 18
articles published from 2008 to 2022. Following closely, author Gangl K had the second highest number of articles with 10 publications on tax compliance from 2014 to 2022.

**Clustering Analysis Results**

![Figure 4](image)

**Figure 4.** Presents 5 clusters containing keywords

The RStudio software program's thematic map contains 9 clusters, determining the most frequently used words in research on "Tax Compliance." The figure above presents 5 clusters containing keywords. The most frequently used keyword in the Dimensions database is "Humans" in the blue group, followed by "Health Policy" in green, and "covid 19" in orange. When considering the authors' keywords, specific themes also emerge, such as Item Response Theory (IRT) and multidimensional item response theory. The emerging themes are IRT and assessment. The foundational (developing) theme is measurement and psychometrics. The motoric (developed) themes are reliability and validity. Differential item functioning and measurement invariance clusters lie between two quadrants, including item response theory, Rasch model, and classical test theory clusters.

**Graphical analysis of Information Sciences with VOSviewer**

![Figure 5](image)

**Figure 5.** Graphic of information sciences with VOSviewer
Meanwhile, the VOSviewer software program determines the most frequently used words in research on "Tax Compliance." The figure above presents 5 clusters containing keywords. The most frequently used keyword in the Dimensions database is "taxis" in the red group, followed by "tax payment" in green, and "responsibility" in blue. The concept of bibliometric network visualization, often termed 'scientific mapping,' has gained significant attention since the inception of bibliometric research. Visualization has proven to be an effective approach for analyzing various bibliometric networks, including citation relationship networks between publications or journals, co-authorship networks among researchers, or co-occurrence networks among keywords.

![Figure 6. Density visualization to analyze future research topic opportunities](image)

Density visualization is used to analyze future research topic opportunities. The larger and brighter the keyword visualization, the more frequently it has been researched. Conversely, the darker the visualization, the less frequently the keyword has been researched. Some clearly depicted keywords are tax morale, tax compliance, and tax avoidance, indicating that these topics have been extensively studied. Keywords depicted with moderate clarity, such as taxis and tax compliance, are relatively well-researched topics, though not as much as those with clear visualizations. Keywords like humans and gender are depicted in smaller and dimmer colors, indicating that these topics are still rarely discussed and thus have potential for future research. Therefore, these topics are of interest, especially in their relation to tax compliance.
DISCUSSION

This study provides a comprehensive bibliometric and visual analysis of tax compliance research from 1977 to 2024, as indexed in the Dimensions database. The findings reveal the most prolific countries in terms of tax compliance publications, with Australia, Austria, Canada, Italy and the United States leading the way in this regard. These findings also emphasize the role of human factors in tax compliance, especially the impact of gender, cultural context, and level of education on taxpayer behavior (Fidiana, 2020). This understanding is critical for policymakers who want to design a more inclusive and effective tax system. For example, understanding that women in general may be more compliant due to risk aversion (Nelson, 2015) and higher social roles could inform targeted education programs and law enforcement strategies.

CONCLUSION

Summary of Research Findings

The research aimed to map and analyze gender-related trends in taxpayer compliance using bibliometric analysis of publications from 1977 to 2024. Key findings include:

1. Publication Trends
   - From 1977 to 2024, 1549 authors contributed to 500 articles on tax compliance.
   - A notable increase in publications, particularly from 2015 onwards, with a fourfold increase in articles by 2022.

2. Authorship and Collaboration
   - The study identified key authors and institutions, highlighting collaboration dynamics.
   - Erick Kirchler emerged as the most prolific author with 18 publications, followed by Gangl K with 10.

3. Keyword and Thematic Analysis
   - Frequent keywords included "humans," "United States," "female," and "male," indicating significant focus areas.
   - Clustering analysis revealed five main thematic clusters, with key topics such as Item Response Theory (IRT), psychometrics, reliability, and validity.

4. Gender and Tax Compliance
   - Women are generally found to be more compliant with tax regulations than men, attributed to higher risk aversion and social roles.
   - However, this compliance varies based on factors like education, tax awareness, and the prevailing tax system.

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REFERENCES


