

Factors Influencing the Shadow Economy: Insights from a Systematic Review

Ikbal Thoha Saleh¹, Choirul Saleh², Lely Indah Mindarti³, Sujarwoto⁴
{ikbalthohasaleh@gmail.com¹, choirulsaleh@ub.ac.id², lelyfia@ub.ac.id³,
Sujarwoto@ub.ac.id⁴}

Brawijaya University, Malang, East Java, Indonesia^{1,2,3,4}

Abstract. The Shadow Economy plays a critical role in both developed and developing economies, with wide-ranging implications for governance, economic policy, and social welfare. This study presents a systematic review using bibliometric analysis of 306 documents from 1984 to 2024, exploring key trends and factors influencing the Shadow Economy. The analysis reveals an annual growth rate of 8.27%, with research spread across disciplines such as economics, social sciences, and business. Ukraine, the UK, and Germany are leading contributors to the research, highlighting the importance of the Shadow Economy in transitional and developed economies alike. Emerging themes such as cryptocurrency and digital shadow economies point to evolving informal economic activities, while traditional areas like tax evasion, corruption, and informal labor markets remain central. The study identifies potential research directions, including the impact of digitalization, policy interventions, and regional comparisons. This review contributes to the understanding of the Shadow Economy, offering insights into its evolving nature and guiding future research and policy development.

Keywords: Shadow Economy, Informal Economy, Tax Evasion, Bibliometric Analysis

1 Introduction

The Shadow Economy also referred to as the underground or informal economy, encompasses all economic activities—both legal and illegal—that are not recorded in official statistics, particularly in the calculation of a country's Gross Domestic Product (GDP) [1]. This includes all forms of transactions, whether conducted through currency or barter, that escape formal taxation and government oversight. According to Kristianto & Fentura [2], the Shadow Economy refers to income derived from the production of goods and services that is deliberately concealed from authorities to avoid taxes or regulatory oversight. These activities distort the accuracy of official economic indicators, leaving a significant portion of economic output unaccounted for in national statistics. Similarly, Medina and Schneider [9] estimate that the size of the Shadow Economy can range from 10% to 40% of GDP in many countries, further emphasizing the extent of the issue on a global scale.

Despite the pivotal role that the Shadow Economy plays in shaping the true economic landscape, its full scope remains under-researched and often misunderstood. Activities within this realm, ranging from informal labor and unreported business transactions to illicit trade, can contribute substantially to economic activity without being reflected in GDP or tax revenues. This phenomenon is observable across both developed and developing countries, including Indonesia, where it complicates the ability of governments to gauge economic performance accurately (Rezky, 2020). Furthermore, the International Labour Organization (ILO) reports that nearly 61% of the world's workforce operates within the informal sector, underscoring the

global relevance of the Shadow Economy [4].

Research on the Shadow Economy is crucial because of its profound implications for public policy, taxation, and economic development. The underreporting of such activities leads to significant revenue losses, undermines the effectiveness of public administration, and distorts macroeconomic analysis [1]. This results in challenges for governments in terms of designing effective tax policies, addressing social inequality, and creating reliable economic forecasts. Moreover, the informal sector often lacks legal protection, which can exacerbate labor exploitation and hinder sustainable development [5]. The complexities surrounding tax evasion, social inequities, and regulatory loopholes highlight the need for robust empirical research to inform policy interventions. While the concept of the Shadow Economy is not new, its importance has gained renewed attention due to ongoing global challenges such as rising income inequality, taxation evasion, and economic stagnation. The COVID-19 pandemic, for example, led to a surge in informal and unrecorded activities as formal sectors contracted under government-imposed lockdowns (OECD, 2020). These trends suggest a growing need for robust research that accurately maps the size, drivers, and consequences of the Shadow Economy on national and global scales.

Despite its significance, the literature on the Shadow Economy remains fragmented, particularly in terms of comprehensive bibliometric analysis. There is a notable research gap in understanding how scholarly contributions on this topic have evolved over time, which journals and sources are most relevant, and who the leading researchers in the field are. Most existing studies focus on estimating the size of the Shadow Economy or examining its effects on specific sectors, but few address the bibliometric landscape that can provide a broader understanding of research trends and knowledge gaps [6]. Furthermore, little attention has been paid to the co-occurrence of key terms, collaboration networks, or regional production of research in this domain.

This study aims to fill this gap by conducting a bibliometric analysis of research on the Shadow Economy, drawing on data from the Scopus database. It seeks to answer key questions about the volume of published research, the most influential authors, the geographic distribution of research output, and the most relevant keywords and topics associated with this field. This type of analysis will provide valuable insights into the current state of knowledge, identify research trends, and highlight underexplored areas that warrant further investigation [7]. The novelty of this research lies in its use of bibliometric tools to map out the intellectual structure of Shadow Economy studies. By employing methods such as citation analysis, co-occurrence analysis, and network analysis, this study will contribute to a systematic understanding of the academic landscape surrounding the Shadow Economy, offering new insights for both scholars and policymakers. This research is particularly timely, given the increasing importance of informal economies in both developed and developing nations and the need for effective policy responses to address their growth.

In summary, this paper provides an in-depth bibliometric analysis of Shadow Economy research. It addresses the research gap in understanding how scholarly output in this area has evolved while also identifying key trends and future research directions. The findings will offer valuable contributions to both academia and policy, particularly in the areas of economic development, taxation, and labor market reforms.

2 Method

This study employs a bibliometric analysis that follows several fundamental protocols in the literature review process [8]. The analysis is conducted systematically through explicit stages,

ensuring high transparency and allowing other researchers to replicate the study. Additionally, this analysis follows a mind mapping approach [9] enabling the identification of knowledge boundaries within the study of the Shadow Economy. Bibliometric analysis is commonly used across various disciplines to quantitatively map scientific publications, including journal articles, books, and other written forms of publication [10].

2.1 Key Steps in Bibliometric Analysis

To conduct a comprehensive analysis of research related to the Shadow Economy, we utilized a bibliometric approach by following five key steps, adopted from standard methods [8]:

- 1) **Defining Research Questions:** The research questions are focused on the theme of the Shadow Economy, including the number of published documents, the most relevant sources, influential authors, scientific production by country, and emerging affiliation and collaboration networks. These questions, detailed below, form the framework to guide the analysis (see RQ1 through RQ10).
- 2) **Data Collection:** Data was collected from the Scopus database, recognized as one of the largest sources of peer-reviewed scientific literature. The keyword “Shadow Economy” was used to search for relevant documents. Only documents published in English, including journal articles, conference proceedings, and book chapters, were included. After filtering, a total of 306 documents were retrieved. The study covers the publication period from 1984 to 2024, providing a comprehensive view of research trends related to the Shadow Economy.
- 3) **Data Processing and Cleaning:** After data collection, a cleaning process was conducted to ensure consistency and accuracy. Duplicate documents were removed, and missing information (such as incomplete author names or affiliations) was checked and supplemented where necessary. Additionally, we normalized keywords to avoid semantic differences that could lead to inconsistencies, such as between the terms “shadow economy” and “underground economy.”
- 4) **Data Analysis Using Bibliometric Tools:**
 - a) **R Biblioshiny:** Bibliometric analysis was conducted using R Biblioshiny, a web-based interface of the Bibliometrix package in R, allowing for the visualization and mining of bibliographic data. This tool was used to:
 - **Descriptive Analysis:** Calculate basic statistics such as the number of publications per year, research growth rate, and citation patterns.
 - **Most Relevant Sources and Authors:** Identify the most influential journals, authors, and publishers in the field of the Shadow Economy. This method includes an h-index analysis to measure the impact of authors and journals.
 - **Keyword Co-occurrence:** By mapping the relationships between frequently co-occurring keywords, we identified prominent research themes and key focus areas within the literature.
 - **Collaboration Networks:** Co-authorship analysis was conducted to explore collaboration patterns between researchers and institutional affiliations. International collaboration networks were also analyzed to highlight cross-border contributions to Shadow Economy research.
 - b) **VOSviewer:** VOSviewer was used to visualize large networks and discover new themes and emerging research trends in the field of the Shadow Economy. VOSviewer was specifically used for:

- Term Mapping and Clustering: This tool helps detect thematic clusters and the relationships between frequently occurring terms through text analysis of titles and abstracts. These visual maps allow us to identify research trends and emerging themes in Shadow Economy studies.
- 5) Interpretation and Presentation of Findings: The results of this analysis are presented in the form of graphs, tables, and visual maps generated by R Biblioshiny and VOSviewer. These results include identifying the most influential authors, the most productive journals, major research themes, and international collaboration networks. Additionally, this bibliometric analysis provides a guide for future research by identifying research gaps and underexplored themes in the field of the Shadow Economy.

2.2 Research Question

To guide this bibliometric analysis, several research questions (RQ) were formulated, covering various aspects of the Shadow Economy. These questions aim to identify key themes, publication trends, and major contributors in this field. The research questions are as follows:

- RQ1: What are the key pieces of information regarding the Shadow Economy theme?
- RQ2: How many research documents have been published on the topic of the Shadow Economy?
- RQ3: Which are the most relevant sources in the field of Shadow Economy research?
- RQ4: Who are the most influential authors in Shadow Economy research?
- RQ5: What is the scientific production by country in Shadow Economy research?
- RQ6: What are the most relevant affiliations in Shadow Economy research?
- RQ7: What are the primary subject areas covered in Shadow Economy research documents?
- RQ8: What insights can be gained from a treemap visualization of Shadow Economy research?
- RQ9: What does the co-occurrence network reveal about key terms and concepts in Shadow Economy research?
- RQ10: What are the results of network analysis in the context of Shadow Economy research?

2.3 Limitations of The Study

While this bibliometric analysis provides valuable insights, several limitations must be acknowledged. First, this study relies on data from Scopus, meaning that publications not indexed by Scopus were excluded. This may result in the omission of relevant research from other databases, such as Web of Science or Google Scholar. Second, the focus on English-language publications may overlook important contributions in other languages, especially in countries with significant informal economies.

3 Result

This section presents the findings of the bibliometric analysis of research related to the Shadow Economy, following the guiding research questions (RQs). The results are based on the analysis of 306 research documents published between 1984 and 2024, as retrieved from the Scopus database.

1. What are the Key Pieces of Information Regarding the Shadow Economy Theme? (RQ1)



Figure 1. Main Information

- 1) Timespan (1984-2024):
The research on the Shadow Economy spans 40 years, indicating sustained academic interest in this topic across multiple decades. This long duration shows that the concept of the Shadow Economy has been relevant for several decades, continually evolving with global economic shifts.
- 2) Sources (163):
A total of 163 different sources (journals, books, or conference proceedings) have contributed to this body of research. This suggests that research on the Shadow Economy is distributed across a wide variety of academic outlets, reflecting its interdisciplinary nature.
- 3) Documents (306):
306 publications have been identified, representing a significant body of research. This volume highlights the growing interest in understanding the Shadow Economy, its drivers, and its consequences for economies globally.
- 4) Annual Growth Rate (8.27%):
The annual growth rate of 8.27% signals a robust increase in publications over time. This suggests a rising interest in the topic, possibly driven by global economic trends and the increasing importance of informal economies in both developed and developing nations.
- 5) Authors (624):
A total of 624 authors have contributed to the literature on the Shadow Economy, which reflects a broad scholarly engagement. This also highlights the collaborative nature of the field, as a wide range of perspectives are contributing to the discourse.

- 6) **Single-Author Documents (60):**
Only 60 documents have been written by a single author, which is relatively low, further underscoring the collaborative nature of research on the Shadow Economy.
- 7) **International Co-Authorship (32.68%):**
32.68% of the documents involve international co-authorship, reflecting the global relevance of the Shadow Economy. This indicates that researchers from different countries frequently collaborate, emphasizing the importance of studying the Shadow Economy from a comparative, cross-national perspective.
- 8) **Co-Authors per Document (2.64):**
On average, each document has 2.64 co-authors, showing that research on this topic is typically conducted in teams. Collaboration in research can lead to more comprehensive studies and diverse perspectives, which may enrich the field.
- 9) **Author's Keywords (868):**
868 unique keywords have been used across the publications, reflecting the diverse range of themes and concepts that are explored within the Shadow Economy literature. This points to a wide scope of subtopics under the larger umbrella of the Shadow Economy, which may include informal labor, tax evasion, underground markets, and economic policy.
- 10) **Document Average Age (5.57 years):**
The average age of the documents is 5.57 years, indicating that much of the research is relatively recent. This suggests that the Shadow Economy remains a contemporary issue in academic discourse, with ongoing research efforts exploring new aspects of the phenomenon.
- 11) **Average Citations per Document (17.74):**
With an average of 17.74 citations per document, this suggests that the research on the Shadow Economy is well-cited and influential within academic circles. High citation rates often indicate that the research is widely recognized and used as a reference point in related studies.

2. How many research documents have been published on the topic of the Shadow Economy?

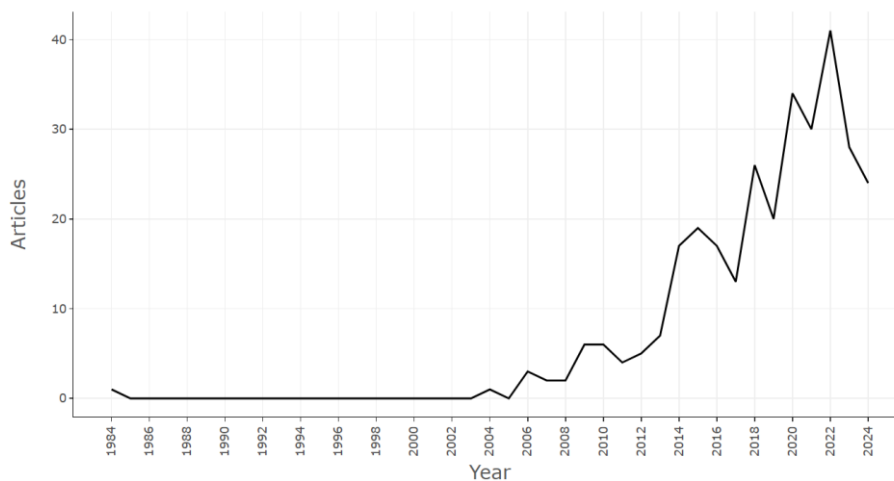


Figure 2. Annual Scientific Production

Based on Figure 2, the number of research documents published on the topic of the Shadow Economy has significantly increased over the past few decades. From 1984 to around 2005, research activity was minimal, with only a handful of publications during this period. However, starting around 2010, the number of publications began to rise steadily, with a notable surge in research output from 2014 onwards. The peak of publication activity occurred between 2020 and 2022 when the number of documents exceeded 40 articles per year. This surge indicates a growing interest in understanding the Shadow Economy, likely fueled by modern economic challenges, policy reforms, and the global focus on informal sectors. Although there is a slight decline in publications projected for 2023 and 2024, the overall trend reveals that research on the Shadow Economy has gained substantial momentum in recent years, making it an increasingly important field of academic inquiry. In total, 306 documents have been published, reflecting a strong and expanding body of work dedicated to this critical subject.

3. Which are the most relevant sources in the field of Shadow Economy research?

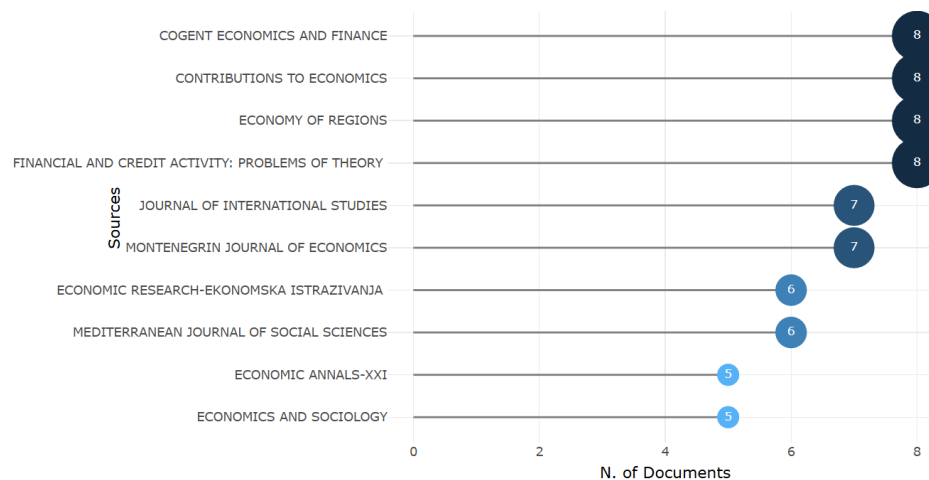


Figure 3. Most Relevant Source

Based on Figure 3, the most relevant sources in the field of Shadow Economy research can be identified based on the number of documents they have published on the topic. From the chart provided, the top sources contributing the most publications include:

- Cogent Economics and Finance, Contributions to Economics, Economy of Regions, and Financial and Credit Activity: Problems of Theory, each with 8 documents published. These sources are the leading contributors to research on the Shadow Economy, indicating their importance in shaping the academic discourse on this topic.
- The Journal of International Studies and the Montenegrin Journal of Economics follow closely, each publishing 7 documents.
- Economic Research-Ekonomska Istraživanja and the Mediterranean Journal of Social Sciences each have 6 documents published.
- Lastly, Economic Annals-XXI and Economics and Sociology have contributed 5 documents each.

These journals and sources are central to the dissemination of knowledge and research on the Shadow Economy, reflecting their relevance to the field. They represent key platforms

where scholars contribute their findings on this critical topic, highlighting interdisciplinary engagement with economics, sociology, and regional studies.

4. Who are the most influential authors in Shadow Economy research?

Based on Figure 4: Most Influential Authors, the most prolific contributors to Shadow Economy research are Schneider F and Williams CC, each with 14 published documents, positioning them as leading figures in the field. Tiutiunyk I follows with 10 publications, establishing a strong presence in this area of research. Horodnic IA has contributed 9 documents, adding significant value to the academic discussion. Remeikiene R has published 7 documents, further contributing to the growing body of knowledge. Additionally, Gasparenienė L, Gasparenienė R each have 6 publications, highlighting their consistent involvement in this research area. Finally, Achim MV and Arandarenko M, with 5 documents each, also play notable roles in advancing the understanding of the Shadow Economy. These authors have collectively made substantial contributions to the field, helping to shape the current research landscape and providing valuable insights into the complexities of informal economic activities.

These authors have contributed significantly to both theoretical and empirical studies, offering critical insights into the measurement, drivers, and consequences of shadow economies around the world. Below are some of the key works by these leading figures, showcasing their methodological innovations and practical implications for policy and governance.

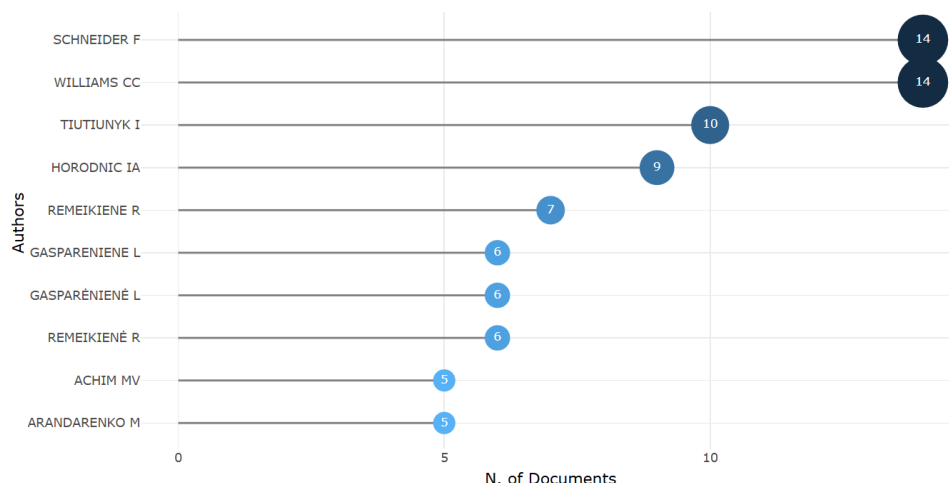


Figure 4. Most Influential Authors

Here are some specific research studies conducted by the most influential authors in Shadow Economy research:

- a) Schneider F. [11] : In his paper “*Estimating the Size of the Shadow Economy in 162 Countries Using a MIMIC Approach*”, Schneider applies the MIMIC model to estimate that the global shadow economy averages 22% of GDP, with significant regional differences. This work highlights the global scale of informal activities and their economic impact.

- b) Williams CC. [12]: Williams, in *“Tackling the Shadow Economy through Deterrence and Tax Morale: The Case of the European Union”*, examines how improving tax morale and enforcing deterrence can reduce informal economic activities within EU member states. His findings suggest that strengthening public trust and fairness in taxation systems is crucial for diminishing the shadow economy's scope.
- c) Horodnic IA. [13]: Horodnic's research, *“The Informal Economy in Eastern Europe: An Institutional Perspective”*, focuses on the institutional drivers of the shadow economy in Eastern Europe, such as weak governance and low public trust, that compel individuals and businesses to participate informally.
- d) Remeikiene R. & Gaspareniene L. [14]: In *“Impact of Tax Morale on the Shadow Economy in Lithuania”*, Remeikiene and Gaspareniene explore how low tax morale and complicated tax regulations drive informal work in Lithuania. Their research emphasizes the role of public attitudes and systemic inefficiencies in expanding the informal sector.

These works represent key contributions to understanding the complexities of the shadow economy, providing insights into measurement methods, regional dynamics, and policy solutions.

5. What is the scientific production by country in Shadow Economy research?

Based on Figure 5: Scientific Production by Country, the countries with the highest scientific output in Shadow Economy research are:

- a) Ukraine leads significantly with 108 documents, indicating that the country is a major contributor to the field. Ukraine's dominant presence could be linked to the nation's unique economic conditions and the relevance of the Shadow Economy in its policy and academic discussions.
- b) The United Kingdom follows with 51 documents, showcasing its active role in research related to informal economies and the Shadow Economy.
- c) Germany has produced 38 documents, reflecting its strong research infrastructure and interest in the dynamics of the informal sector.
- d) Poland and Romania both contribute 37 documents, illustrating a shared regional focus on the Shadow Economy, likely driven by similar economic challenges in Central and Eastern Europe.
- e) Lithuania is another key contributor with 35 documents, underscoring its engagement in research on this topic.
- f) The United States has produced 29 documents, indicating the relevance of Shadow Economy research even in more formalized and structured economies.

- g) Austria with 25 documents, Italy with 21, and Serbia with 19 documents round out the top contributors.

Region	Freq
UKRAINE	108
UK	51
GERMANY	38
POLAND	37
ROMANIA	37
LITHUANIA	35
USA	29
AUSTRIA	25
ITALY	21
SERBIA	19

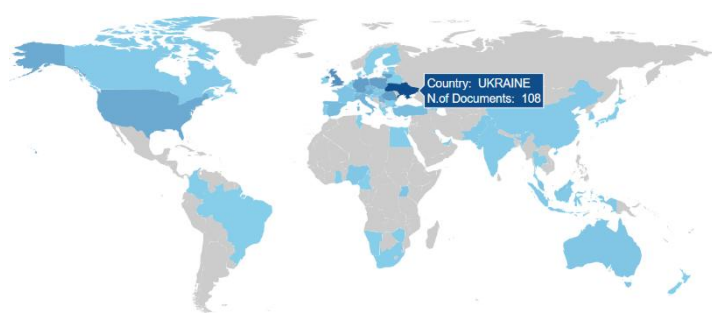


Figure 5. Scientific Production by Country

This geographic distribution shows that Europe is a dominant region in Shadow Economy research, with a particular focus on Eastern and Central European countries. This likely reflects the importance of informal economies in these regions and the academic attention it garners. Other countries like the USA also play significant roles, indicating global interest in understanding the Shadow Economy across various economic contexts.

6. What are the most relevant affiliations in Shadow Economy research?

Based on Figure 6: Most Relevant Affiliations, the leading institutions contributing to Shadow Economy research are as follows:

- Sumy State University stands out as the top contributor, with 30 articles published, making it a central hub for research on the Shadow Economy.
- University of Sheffield follows with 17 articles, showcasing its significant role in advancing understanding of informal economies.
- University of Belgrade has published 15 articles, marking it as another key institution in this field.
- Ho Chi Minh City Open University and Lviv State University of Internal Affairs both contributed 11 articles each, indicating strong research activity in this domain.
- Mykolas Romeris University has produced 10 articles, further highlighting its engagement with Shadow Economy research.
- Johannes Kepler University of Linz follows with 9 articles, showing a notable academic contribution.
- Alexandru Ioan Cuza University of Iasi and Lviv Polytechnic National University both contributed 7 articles each.
- Finally, Bucharest University of Economic Studies has published 6 articles, rounding out the top contributors.

These affiliations represent the most active research institutions in the Shadow Economy

field. Notably, many of these institutions are based in Eastern Europe, which reflects the region's interest in studying the Shadow Economy due to its socio-economic relevance. Additionally, institutions from other regions, such as the University of Sheffield in the UK and Ho Chi Minh City Open University in Vietnam, show that research on this topic has a global reach.

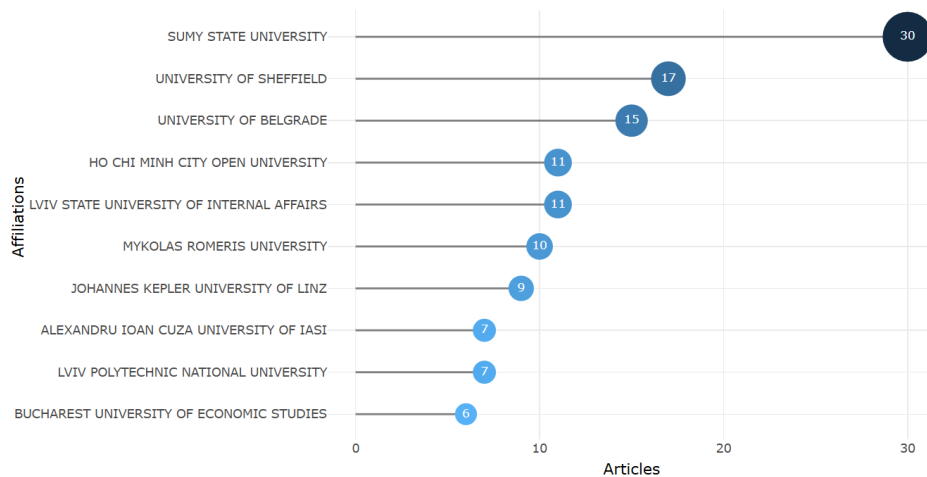


Figure 6. Most Relevant Affiliation

7. What are the primary subject areas covered in Shadow Economy research documents?

Documents by subject area

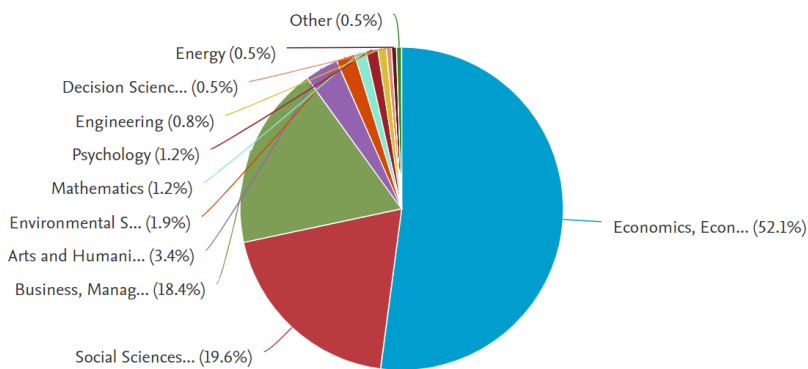


Figure 7. Documents by Subject Area

Based on Figure 7: Documents by Subject Area, the primary subject areas covered in Shadow Economy research documents are:

- Economics and Econometrics account for the largest portion of the research, representing 52.1% of the documents. This is expected, as the Shadow Economy is closely linked to economic systems, tax policies, and informal market activities.
- Social Sciences follows with 19.6%, indicating a strong focus on the societal and behavioral implications of the Shadow Economy, such as inequality, social justice, and labor markets.
- Business, Management, and Accounting make up 18.4% of the research, reflecting interest in the impact of the Shadow Economy on business practices, corporate governance, and management strategies, particularly in informal sectors.
- Arts and Humanities contribute 3.4%, suggesting a smaller but meaningful engagement with the cultural, ethical, and philosophical aspects of the Shadow Economy.
- Environmental Science (1.9%) and Mathematics (1.2%) show minimal but notable contributions, possibly related to environmental impacts and the use of mathematical models to understand the dynamics of informal economies.
- Psychology (1.2%) may explore the psychological factors driving participation in the Shadow Economy or the effects of informal economic activities on individuals.
- Engineering (0.8%) and Decision Sciences (0.5%) have smaller shares, indicating occasional interdisciplinary work involving technical aspects or decision-making processes within informal economies.
- Energy (0.5%) and Other (0.5%) represent the smallest portions, likely addressing niche topics within the broader context of the Shadow Economy.

In summary, the majority of research on the Shadow Economy is concentrated in Economics, Social Sciences, and Business, reflecting the primary interest in understanding economic impacts, societal consequences, and management within informal sectors. However, a broad range of disciplines contributes to this field, highlighting its interdisciplinary nature.

8. What insights can be gained from a treemap visualization of Shadow Economy research?



Figure 8. Tree Map Visualization

The treemap visualization of Shadow Economy research provides insights into the most commonly researched themes and their relative importance. Larger blocks represent topics with

higher frequency of occurrence, indicating they are the focal points of research in this field. Key themes such as the black market, tax system, parallel economy, and the informal sector appear prominently, reflecting central areas of interest. These topics suggest that researchers focus heavily on the illegal and informal markets, taxation issues, and broader economic systems that operate parallel to the formal economy.

Other relevant themes include corruption, employment, and economic policy, which point to the broader socio-economic consequences of the Shadow Economy. Additionally, geographic areas such as Serbia, Europe, and Central Europe are also significant, showing regional emphasis in the study of informal economies. Overall, the treemap shows a diverse range of topics, emphasizing the interdisciplinary nature of Shadow Economy research, with economic, social, and policy-related themes being central to the discourse. It highlights not only economic structures but also societal impacts and geographic specificities.

9. What does the co-occurrence network reveal about key terms and concepts in Shadow Economy research?

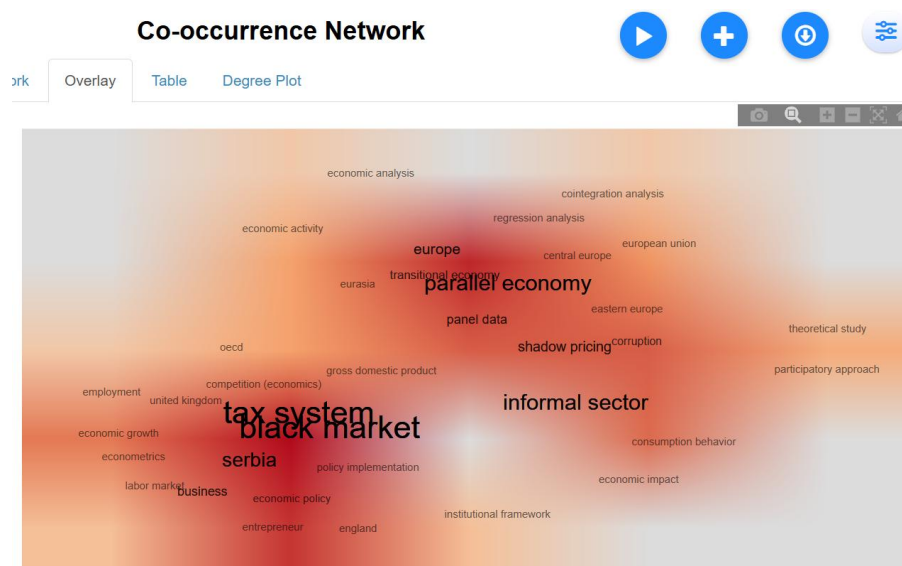


Figure 9. Co-Occurrence Network

The co-occurrence network in Figure 9 reveals the relationships between key terms and concepts frequently studied together in Shadow Economy research. Prominent terms such as black market, tax system, parallel economy, and informal sector appear centrally, indicating that these are core concepts closely associated with the broader discussion of the Shadow Economy. The centrality and size of these terms suggest they are highly interconnected with various other themes and are frequently studied together.

Other terms like Serbia, Europe, corruption, and panel data are also important, reflecting the regional and methodological focus of research in this field. The presence of regional terms like Serbia and Europe highlights the geographic emphasis on specific countries and regions that may have significant informal economic activities. Additionally, the use of panel data and regression analysis indicates the quantitative methods commonly employed in studying these phenomena. The proximity of concepts such as shadow pricing, business, and economic policy

challenges. Policymakers are likely concerned with how the Shadow Economy affects economic performance, public budgets, and income inequality, suggesting areas where research could inform policy interventions.

- c) **Regional and Country-Specific Focus:** Specific regions and countries like Greece, Poland, Lithuania, Bulgaria, and the European Union emerge as nodes in the network. This suggests that much research is geographically focused, analyzing how the Shadow Economy manifests in specific national or regional contexts, particularly in Europe. This may point to comparative studies of the Shadow Economy in different economic systems and governance structures.
- d) **Related Concepts and Emerging Themes:** The network also reveals links to emerging themes such as “cryptocurrency,” “digital shadow economy,” “cybercrime,” and “bitcoin,” reflecting the impact of technological advancements on informal and illicit economic activities. These are newer areas of research that are gaining traction as digital currencies and online transactions play a growing role in the Shadow Economy.
- e) **Other Relevant Concepts:** Terms like “undeclared work,” “tax morale,” “poverty,” “environmental pollution,” and “macro-financial stability” indicate that the Shadow Economy intersects with broader social and environmental issues. The connection between informal work and social factors such as poverty or tax morale highlights the need for integrated approaches to studying the informal economy.

4 Discussion

The bibliometric analysis of research on the Shadow Economy reveals several key insights, showing the field's growth, interdisciplinary nature, and global relevance. Over the past four decades, research on the Shadow Economy has expanded significantly, reflecting increasing academic interest driven by global economic challenges and policy reforms. The steady increase in publications since 2010, and particularly after 2014, illustrates the growing awareness of the Shadow Economy's influence on both formal economies and governance structures (RQ1 & RQ2).

The analysis highlights the interdisciplinary nature of the field, with contributions from economics, social sciences, and business disciplines. It demonstrates that the Shadow Economy is not just an economic issue but also a social and political phenomenon (RQ7). This interdisciplinary approach enriches the understanding of how informal economies affect various aspects of society, including taxation, employment, and social inequality. The findings underscore that while economics remains the dominant discipline, there is growing interest in exploring the broader societal impacts of the Shadow Economy.

The geographic distribution of research indicates a significant focus on Eastern Europe, with Ukraine leading in terms of publication output (RQ5). This regional focus may reflect the importance of the Shadow Economy in transitional economies, where informal activities often account for a significant portion of economic output. The presence of high research activity in regions like Eastern Europe and the UK highlights the global nature of the issue, though the regional differences in the size and impact of the Shadow Economy present opportunities for comparative studies.

Emerging themes such as digital shadow economies, cryptocurrency, and cybercrime (RQ9) suggest that new technologies are reshaping informal economic activities. These developments indicate that the Shadow Economy is evolving, with new research needed to explore the role of digital tools in facilitating or controlling informal economic activities. Additionally, concepts like corruption, tax reform, and transparency continue to be central

themes, pointing to the persistent challenge of governing and regulating informal sectors in various economies (RQ8 & RQ10).

4.1 Potential Research Themes to Develop

Based on the findings from the network analysis, several research themes stand out as areas for future exploration:

1. **Digital and Technological Impact:** The emergence of terms like cryptocurrency and digital shadow economy suggests that further research could explore the digitalization of the Shadow Economy. This includes how cryptocurrencies are used in informal economic activities and the challenges this poses for taxation and regulation. As digital currencies and decentralized finance grow, their relationship with informal economies will require more thorough investigation.
 2. **Policy and Governance:** There is a need for research that further investigates the relationship between the Shadow Economy and governance issues such as public administration, fiscal policy, and transparency. Studies focusing on effective policies for reducing the size of the Shadow Economy could provide valuable insights for governments aiming to formalize informal sectors while minimizing negative socio-economic impacts.
 3. **Environmental Impacts:** The connection between the Shadow Economy and environmental pollution is an intriguing area that warrants further exploration. Research should focus on how informal economic activities, especially in regions with weaker regulations, contribute to environmental degradation. This is particularly relevant in sectors such as mining, agriculture, and manufacturing, where informal practices may bypass environmental regulations.
 4. **Socioeconomic Effects:** The themes of poverty, income distribution, and social security suggest that future research should address the social consequences of the Shadow Economy. A critical area of inquiry would be how informal economic activities affect wealth distribution, employment, and social welfare systems, especially in developing countries where social safety nets may be weaker.
 5. **Cross-Country Comparisons:** Given the regional focus observed in this analysis (e.g., Eastern Europe, Greece, Poland), future research could deepen comparative studies of how different regions manage or are impacted by the Shadow Economy. Understanding regional differences and similarities in informal economic activities can lead to more effective policy recommendations tailored to the specific socio-economic contexts of each region.
- In conclusion, the network analysis highlights a rich array of interconnected topics within Shadow Economy research, emphasizing its interdisciplinary nature and relevance across various fields. From policy and governance to digitalization and socio-economic impacts, there are numerous avenues for future research that can deepen our understanding of the Shadow Economy and its implications globally.

5 Conclusion

The results of this bibliometric analysis offer significant contributions to the body of knowledge on the Shadow Economy, highlighting its global, interdisciplinary, and evolving nature. The research field has grown significantly in the past decade, driven by both traditional economic concerns and emerging issues related to digitalization and technology. The continued expansion of the field, as evidenced by the 306 documents and 163 sources, reflects a sustained interest in understanding the drivers, consequences, and policy implications of informal

economic activities.

Key scholars and institutions have shaped the discourse, with regions like Eastern Europe playing a major role in advancing research. As the Shadow Economy continues to evolve in response to technological advances such as cryptocurrency and the digital economy, new challenges and opportunities emerge for both scholars and policymakers. These developments signal important new directions for future research, including studies on the governance of digital informal markets, the role of emerging technologies in the Shadow Economy, and the effectiveness of policy interventions aimed at formalizing informal economic activities.

In conclusion, the Shadow Economy is a complex, multi-faceted issue that intersects with broader economic, social, and political systems. Continued research is needed to fully understand its impact on economic growth, social welfare, and governance. Future studies should focus on cross-regional comparisons, the role of digital economies, and policy effectiveness in curbing informal activities. By doing so, scholars and policymakers can develop more robust strategies for addressing the challenges posed by the Shadow Economy, ensuring that economic systems are inclusive, transparent, and sustainable.

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