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Shadow Economy – Bibliometric Mapping

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Abstract

This study's main objective is reviewing the scientific terminology used in connection and with regard to the shadow economy. In subsidiary, the current research establishes the most explored and researched subject areas in connection with shadow economy and it compares different terms and phrases used in research studies on shadow economy, underground economy and informal economy, as per the Web of Science database. To this extent, VOSviewer – a computer program that was developed for constructing and viewing bibliometric maps was used. The main finding was that, the terminology used with regard to the shadow economy revolves around terms and phrases such as consumption, governance, financial crisis, crime, informal economy, unemployment, inflation, tax evasion and others. The most researched subject areas in connection with shadow economy, based on the terms and phrases mapped are the following: the size and development of the shadow economy, the determinants of shadow economy, the cause and effect analysis, measurement methods and counteracting measures. Other aspects of the shadow economy that appeared to be heavily researched are tax evasion and informal entrepreneurship.

Keywords: *Bibliometric mapping; informal economy; shadow economy; underground economy.*

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1. Introduction

The shadow economy holds significant values in the gross domestic product of various states, with baneful consequences to the general budget, especially in times of financial crisis or economic recession.

Due to this, the shadow economy seems to be a heavily researched subject. Nonetheless, it can be noticed that different and somehow imprecise definitions for this phenomenon are used in the relevant scientific literature dedicated to studying this area.

For this reason a need for a taxonomic framework emerges, that could help distinguish between different concepts used with regard to or instead of shadow economy (such as informal economy, underground economy, hidden economy, subterranean economy, parallel economy, black economy, clandestine economy, illegal economy, and so on).

As a starting point in building this taxonomic framework, we believe having a review over the scientific terminology used in connection and with regard to the shadow economy could be of great use.

2. Problem Statement

As previously stated, a great body of research was dedicated to studying the shadow economy, due to the importance of this phenomenon on the overall economy, on governmental decisions and public policies, on the business sector, on the welfare of the state, and on the day-to-day life of the individual.

According to Schneider and other authors, the illegal nature of shadow economic activities presents a severe hindrance for any measurement and most authors trying to measure the shadow economy still face the difficulty of a precise definition [12], [19].

Moreover, Almenar et. al. state that “defining non-declared activities remains largely controversial in the academic literature” [1].

One definition of the shadow economy states that it “includes the unreported or “off-the-books” ways in which individuals earn income and, it represents activity that would otherwise have been reported in GDP estimates” [9].

Other definitions for the shadow economy are:

- “the part of the legal economy that escapes direct statistical observation because the public administration is not aware of both tax and social security contribution evasion and inobservance of employment regulations” [13];

- “those economic activities and the income derived from them that circumvent or otherwise avoid government regulation, taxation or observation” - [3],[2] and [5], as cited by [19];
- “the shadow economy includes all economic activities which are hidden from official authorities for monetary, regulatory, or institutional reasons” [6];
- “all market-based legal production of goods and services that are deliberately concealed from public authorities to avoid payment of income, value added or other taxes; to avoid payment of social security contributions; having to meet certain legal labour market standards and complying with certain administrative procedures” [10];
- “all productive activities that may not be captured in the basic data sources used for compiling national accounts. The following activities are included: underground, informal (including those undertaken by households for their own final use), illegal, and other activities omitted due to deficiencies in the basic data collection program” [14];
- “activities that are missing from the basic data used to compile the national accounts because they are underground, illegal, informal, household production for own final use, or due to deficiencies in the basic data collection system” [4], [7].

According to Schneider “the shadow economy is something different from the traditional underground (classical crime) economy and the informal household economy” [11]

It can be noticed that many authors still use different and somehow imprecise definitions for shadow economy, many studies relying on proxy values when referring to its size.

3. Research Questions/Aims of the research

This study’s main objective is reviewing the scientific terminology used in connection and with regard to the shadow economy, in subsidiary, establishing the most explored and researched subject areas in connection with shadow economy, as per the Web of Science database. In order to achieve this the VOSviewer software – a freely available computer program that was developed for constructing and viewing bibliometric maps [15] is used.

4. Research Methods

As a research methodology, first, bibliometric data was retrieved from the Web of Science database [18]. The search strategy used was searching records by topic terms – “shadow economy”, “underground economy”, “informal economy” – using as a timespan 2000 – 2020. The search retrieved records mainly from Economics, and some from the following Web of Science Categories: Business Finance, Business, Political Science, Management, and others. Second, bibliographic information (on the authors, titles, sources and abstracts) was extracted, by exporting the records retrieved previously in a plain text format.

Third, a term co-occurrence map based on text data was constructed in the VOSviewer software [17], by reading the data from the Web of Science bibliographic database exported file. The terms were extracted from titles and abstracts, the binary counting being selected as a method. According to some authors, in order to construct bibliometric networks, “researchers have traditionally used the full counting method” [8].

Moreover, a thesaurus file was used in order for common words to be ignored (such as author, article, study, research, etc.). In the step – verify selected terms, a series of irrelevant terms were eliminated (such as country names or non-specific items).

5. Findings

In this section, we create various term maps based on a corpus of scientific documents extracted from the Web of Science database. To this end the text mining functionality of the VOSviewer software is used in order to explore scientific databases and generate maps of the co-occurrence network of terms when searching for “shadow economy”, “underground economy” and “informal economy”.

5.1. Shadow economy – visualization map

The first term map created with regard to the topic “shadow economy” is based on a corpus of scientific documents extracted from the Web of Science database that consists of the titles and abstracts of 11.952 publications that appeared in the period 2000–2020. Out of the 289 noun phrases that occur in at least 10 publications in the corpus, the term map contains the 170 noun phrases that are considered most relevant.

This relevance is determined as follows: “for each noun phrase, the distribution of (second-order) co-occurrences over all noun phrases is

determined. This distribution is compared with the overall distribution of co-occurrences over noun phrases. The larger the difference between the two distributions (measured using the Kullback-Leibler distance), the higher the relevance of a noun phrase” [16].

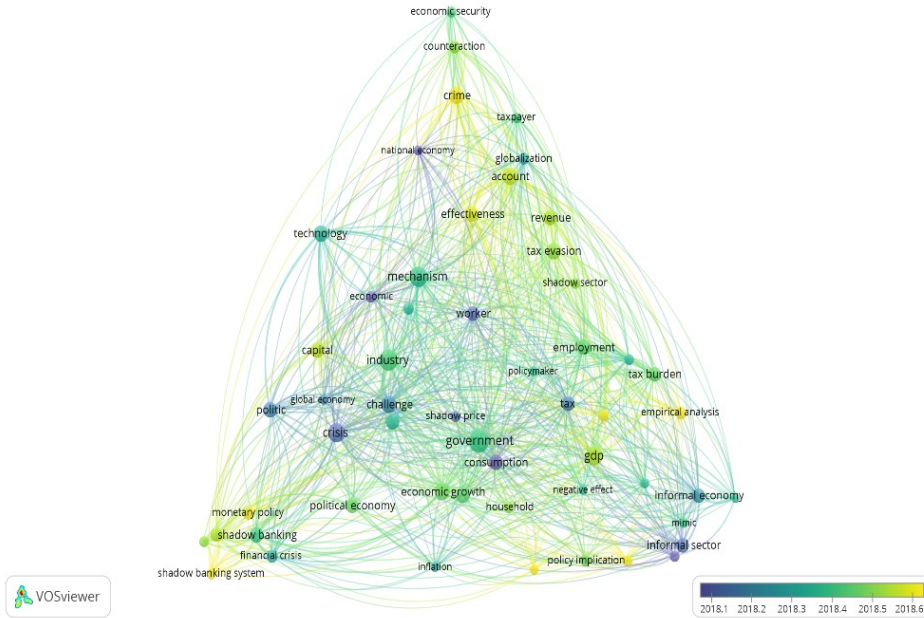


Figure 1: VOSviewer visualization map – co-occurrence network of terms when searching for shadow economy. Source: own generation.

As it can be seen in Figure 1 and Table 1, the map has 5 clusters, and it links the shadow economy to terms, such as: consumption, governance, financial crisis, crime, income inequality, informal economy, unemployment, inflation, tax evasion, etc. The term shadow economy was eliminated when generating the map when verifying selected terms, as it was overlapping on the graph.

Table 1: Summary of the co-occurrence network of terms VOSviewer – topic shadow economy. Source: own generation.

Cluster 1	1. Empirical analysis	2. Employment	3. Entrepreneur
	4. Formal economy	5. GDP	6. Income inequality
	7. Informal economy	8. Informal sector	9. Informality
	10. Mimic	11. Negative effect	12. Negative impact

	13. Policy implication 16. Unemployment	14. Policymaker -	15. Tax burden -
Cluster 2	1. Benefit 4. Economic 7. Financial system 10. Monetary policy 13. Shadow banking	2. Challenge 5. Economic growth 8. Global economy 11. Politic 14. Shadow banking system	3. Crisis 6. Financial crisis 9. Global financial crisis 12. Political economy -
Cluster 3	1. Account 4. Economic security 7. Mechanism 10. Shadow sector 13. Taxpayer	2. Counteraction 5. Effectiveness 8. National economy 11. Size -	3. Crime 6. Globalization 9. Revenue 12. Tax evasion -
Cluster 4	1. Capital 4. Market economy 7. Worker	2. Governance 5. Shadow price -	3. Industry 6. Technology -
Cluster 5	1. Consumption 4. Inflation	2. Government 5. Tax	3. Household -

5.2. Underground economy – visualization map

The second term map created with regard to the topic “underground economy” is based on a corpus of scientific documents extracted from the Web of Science database that consists of the titles and abstracts of 13.960 publications that appeared in the period 2000–2020. Out of the 265 noun phrases that occur in at least 10 publications in the corpus, the term map contains the 160 noun phrases that are considered most relevant.

As it can be seen in Figure 2 below, the map has 3 clusters, and it links the underground economy to terms, such as: business, corruption, tax evasion, informal economy, shadow economy etc. (as seen in Table 2 below):

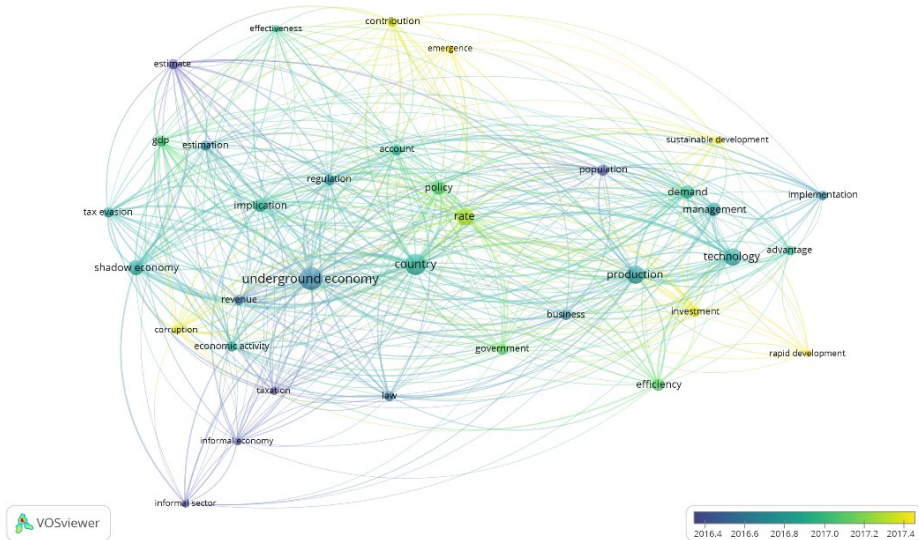


Figure 2: VOSviewer visualization map – co-occurrence network of terms when searching for underground economy. Source: own generation.

Table 2: Summary of the co-occurrence network of terms VOSviewer – topic underground economy. Source: own generation.

Cluster 1	1. Business 4. Government 7. Management 10. Rapid development	2. Demand 5. Implementation 8. Population 11. Sustainable development	3. Efficiency 6. Investment 9. Production -
Cluster 2	1. Contribution 4. Estimate 7. Implication 10. Tax evasion	2. Effectiveness 5. Estimation 8. Rate 11. Taxation	3. Emergence 6. GDP 9. Revenue -
Cluster 3	1. Corruption 4. Informal economy 7. Policy 10. Size	2. Country 5. Informal sector 8. Regulation -	3. Economic activity 6. Law 9. Shadow economy -

5.3. Informal economy – visualization map

The third term map created with regard to the topic “informal economy” is based on a corpus of scientific documents extracted from the Web of Science database that consists of the titles and abstracts of 12.542 publications that appeared in the period 2000–2020. Out of the 292 noun

phrases that occur in at least 10 publications in the corpus, the term map contains the 175 noun phrases that are considered most relevant.

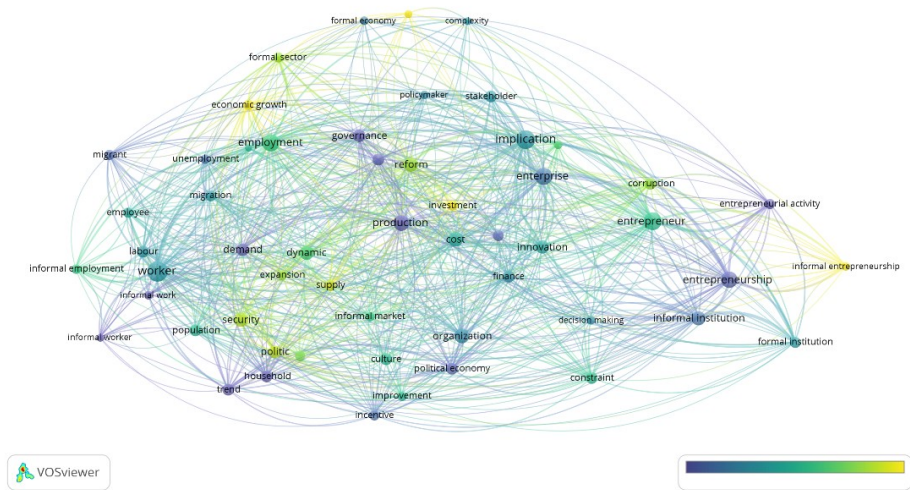


Figure 3: VOSviewer visualization map – co-occurrence network of terms when searching for informal economy. Source: own generation.

As it can be seen in Figure 3 above, the map has 5 clusters, and it links the informal economy to terms, such as: business, corruption, tax evasion, informal economy, shadow economy etc. (as seen in Table 3 below):

Table 3: Summary of the co-occurrence network of terms VOSviewer – topic informal economy. Source: own generation.

Cluster 1	1. Cost	2. Culture	3. Demand
	4. Economic growth	5. Formal sector	6. Informal market
	7. Innovation	8. Investment	9. Organization
	10. Production	11. Productivity	12. Stakeholder
	13. Supply	14. Sustainability	-
Cluster 2	1. Employee	2. Employment	3. Household
	4. Informal employment	5. Informal work	6. Informal worker
	7. Labor	8. Migrant	9. Migration
	10. Population	11. Security	12. Unemployment
	13. Worker	-	-
Cluster	1. Constraint	2. Corruption	3. Decision making

3	4. Enterprise 7. Entrepreneurship 10. Informal entrepreneurship	5. Entrepreneur 8. Finance 11. Informal institution	6. Entrepreneurial activity 9. Formal institution 12. Policy maker
Cluster 4	1. Dynamic 4. Incentive 7. Political economy	2. Expansion 5. Informal settlement 8. Size	3. Improvement 6. Politic 9. Trend
Cluster 5	1. Complexity 4. Governance 7. Reform	2. Formal economy 5. Implication 8. Shadow economy	3. GDP 6. Policymaker -

The term informal economy was eliminated when generating the map, when verifying the selected terms, as it was overlapping on the graph.

6. Discussions

The results of mapping the scientific terminology used in connection and with regard to the shadow economy, by use of VOSviewer, as per the Web of Science database, using as a timespan 2000 – 2020, revealed the terms and phrases most frequently associated with the shadow economy.

The map generated with regard to the topic “shadow economy” contains five clusters, the most occurrences in the first one are for the terms: GDP, informal economy and employment. As for the second one, the most occurrences are for the terms: crisis, economic growth and challenge. In the third one the terms: mechanism, tax evasion, crime appear to have most occurrences and in the fourth and fifth clusters the terms: industry, technology and worker; government, consumption and household.

In what concerns the map created on the topic “underground economy”, it contains three clusters, the most frequent terms used in them being the following: production, technology and management; rate, implication and tax evasion; country, shadow economy and policy.

As for the third map created on the topic “informal economy”, it contains five clusters the terms that have the most occurrences are production, organization and cost; worker, employment and security; enterprise, entrepreneur and entrepreneurship; dynamic, political economy and politic; implication, governance and reform.

Overall, it can be noticed that the term “informal” appears in the following nine phrases: informal economy, informal employment, informal entrepreneurship, informal institution, informal market, informal sector, informal settlement, informal work and informal worker.

By overlaying the terms that appear in at least two of the three maps generated with regard to the studied topics (“shadow economy”, “underground economy” and “informal economy”), the following list of terms emerged: corruption, economic growth, employment, entrepreneur, formal economy, gross domestic product, governance, household, informal economy, informal sector, investment, policymaker, political economy, shadow economy, tax evasion and unemployment.

This paper’s contribution to the current literature is the issuance of original evidence on the scientific terminology used in connection with the shadow economy, and on the most researched subject areas in this domain, by usage of VOSviewer. To the best of our knowledge, no prior studies focused on such research.

7. Conclusions

The current research revealed the scientific terminology used in connection with the shadow economy, underground economy and informal economy, as per the Web of Science database. The most frequent terms used in association with shadow economy, underground economy and informal economy appeared to be: GDP, informal economy, employment, crisis, economic growth, challenge, mechanism, tax evasion, crime, industry, technology, worker, government, consumption, household, production, management, rate, implication, shadow economy, policy, production, organization, cost, enterprise, entrepreneur, entrepreneurship, dynamic, political economy, politic, implication, governance and reform.

Moreover, the research established the following most explored and researched subject areas in connection with shadow economy, underground economy and informal economy – based on the most relevant terms and phrases mapped in VOSviewer:

- The size and development of the shadow economy (terms and phrases such as: size, global economy, financial crisis, rapid development, etc.);
- The determinants of shadow economy (terms and phrases such as: GDP, income inequality, corruption, tax burden, culture, complexity, unemployment, etc.);
- Cause and effect analysis (terms and phrases such as: negative effect, negative impact, etc.);
- Counteracting measures (terms and phrases such as: policymaker, governance, regulation, law, reform, etc.);
- Measurement methods (MIMIC, estimation, etc.).

We believe that finding the most researched subject areas in connection with shadow economy can help build an overview on the state of knowledge on this phenomenon, also revealing the areas that should be researched further.

Other aspects of the hidden or shadow economy that appeared to be heavily researched are tax evasion and informal entrepreneurship.

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