

## Determinants of shadow economy: A bibliometric approach

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### Abstract

This paper performs a systematic literature review on the shadow economy and its determinants based on a bibliometric approach. Based on VosViewer and Web of Science, we identified various drivers of the shadow economy that we clustered into three categories: (1) economic factors, (2) political and institutional variables, and (3) social factors. In the last decades, the increasing role of social factors is significant for the flourish of the shadow economy. This analysis underpins the importance of recent shadow economy determinants such as immigration, cybercrime, happiness, culture, education, and religion – not enough studied and subjected to the public attention. It turns out that the determinants of the shadow economy depend not only on economic and political aspects such as unemployment, foreign direct investment, tax burden, or even the quality of government but also on social aspects such as happiness, culture, inequality, and religion. Based on these findings, the regulation of the shadow economy must be started by governments with reconsidering the measures and taking into account the social aspects, which can be a possible key to restrain this phenomenon. It is obvious that not all social drivers can be influenced by the government, but they can be promoted and deliberately focused with the help of grants or different social programs.

**Keywords:** shadow economy, Informal economy, Bibliometric Approach

**Jel Codes:** E26, O17, D69, H53, C23

### 1. Introduction

The shadow economy has been a highly debated topic for a long time. With the development of the shadow economy, the conceptualization has changed along with it. In earlier studies, the shadow economy was often described as the informal economy. On this basis, various studies of informal economic activities were developed, which determined further progress of research with the various approaches (Boeke, 1953; Lewis, 1954; Kaldor 1956; Cagan, 1958 and Engholm & Geetz, 1964). With the analytical work of Hart (1971, 1973) on the Third World in Ghana, the findings were taken to a new level. The first scientific steps in the field of shadow economy were made in various marginal areas, but mainly in the sociological and anthropological fields (Gërkhani, 2002). Results of the research showed that the shadow economy attracted the highest spread during the Second World War, especially in the United States (Tanzi, 2002).

Over the decades, a large body of literature has accumulated. In this paper, the wide variety of drivers and influencing factors of the shadow economy have been captured and analyzed in a systematic literature review. The literature review is underpinned by bibliometric literature and content analysis (Fetscherin et al., 2010; White et al., 2016; Paul & Benito, 2018; Paul et al. 2017). The bibliometric literature review will serve to summarize and pursue the following research questions: (1) What do we know so far regarding the shadow economy? (2) What are the known and possible lesser-known factors influencing the shadow economy? (3) What are the most known drivers of shadow economy in the literature (journals and data sources)? (4) What future research directions will focus and what are the knowledge gaps?

## 2. Theories regarding the concept of shadow economy

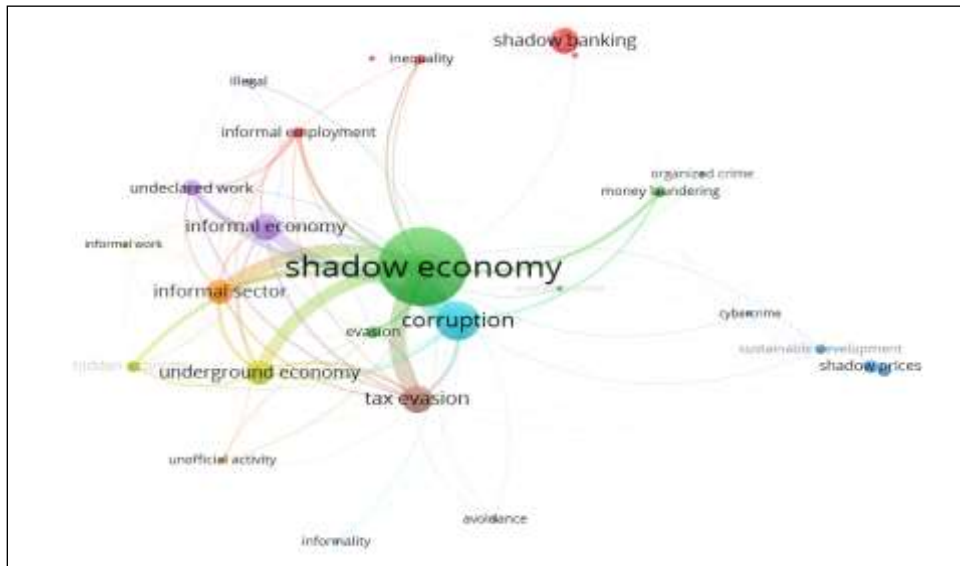
There is no universally accepted and scientifically recognized definition. In order to understand the importance of the shadow economy, it is helpful to present the development with all its different views. For this reason, the existing definitions and explanatory approaches are presented and analyzed.

The conceptual basis of the shadow economy is found in a variety of contexts such as the informal economy, unemployment, and even in the context of crime. One of the well-known synonym used for shadow economy was mentioned for the first time by Arthur W. Lewis in 1955 through the term informal economy defined as underemployment in urban areas. The International Labor Organization underlined the fact that it is not about one sector, but about the whole economy (ILO, Geneva 1972). Another relevant definition for informal economy considered as the activity of those who were financially unsuccessful in the formal sector was mentioned by Hart (1973).

One of the most relevant definition of shadow economy was formulated by Medina and Schneider (2018). According to them, the shadow economy represents "all economic activities" that are "hidden from official authorities for regulatory and institutional reasons".

In the course of the previous work, a wide variety of definitions and explanations were discussed in the context of the shadow economy. Building on this, the effects will now be presented in a descriptive manner in the course of the article. Activities in the unofficial sector result in losses in tax revenues and social security, which the state incurs as a result of shadow economic activities (Buehn & Schneider 2007). As a result, a constant increase in country-specific tax rates is necessary to guarantee the country's budget. If tax revenues were not compensated by tax rate increases, this would lead to a deterioration in public services, and services and goods would be reduced or even discontinued. It would possibly result in an impairment of economic development and thus the prosperity of all (Schneider et al. 2010). In a study, Loayza (1996) found that the shadow economy in Latin America was associated with a decline in official economic growth. The basis of his work represents the reduced provision of public goods. Also, the use and associated efficiency in resources such as labor, capital, and the environment in the legal economy decreases significantly with the activities in the shadow economy and does not contribute to the overall economy (Schneider et al. 2010; Enste 2018). Additionally, crime associated with the informal economy is a hurdle. Activities in the informal economy undermine state institutions, which threatens political development (Enste 2018). The reliability and transparency of public statistics are also only of limited value when a not inconsiderable amount of economic activity takes place in the shadow economy. Policymakers may make inefficient and error-prone decisions based on these statistics and derive policies from them (Fleming et al., 2000; Schneider & Enste 2000; Tanzi 1999).

In science, there are countless terms that are supposed to be equal to the shadow economy. Probably one of the most meaningful and current studies is that of Williams & Schneider (2016), who have elaborated a total of 54 terms, divided into adjectives and nouns, which circumscribes the concept of the shadow economy. For an all-inclusive analysis of the synonyms of shadow economy used, we do not rely on the existing studies but conduct an analysis. We used VosViewer to collect all synonyms found in connection with the shadow economy in the literature between the years 1975 and 2021. It can be seen from **Figure 1** that in the literature, the terms such as corruption, money laundering, avoidance, tax avoidance, informal economy/sector, or even shadow banking are predominantly associated with the shadow economy.



**Figure 1.** Keywords in relation with “shadow economy” 1975-2021.

**Source:** Author’s own composition

### 3. Analysis of Shadow Economy

To illustrate the interest in the topic of the shadow economy, publications and citations were examined in more detail from 1975 to October 2021. There are a total of 2,564 publications about the shadow economy. The topics are widely spread from the economic, social to the legal sector. And so it is evident that there is a lot of interest in the topic of the shadow economy. A total of 20,120 articles were cited under the shadow economy and a total citation over 25,736 times.

In addition to the publications and citations analyzed, an H-index was calculated. The H-index reflects the productivity of authors based on their publications and citations (Hirsch, 2005). The H-index is based on the calculation of Web of Science and examined the authors associated with the shadow economy. It was possible to find an H-index above 68, which expresses a high activity and therefore a good quality of the authors.

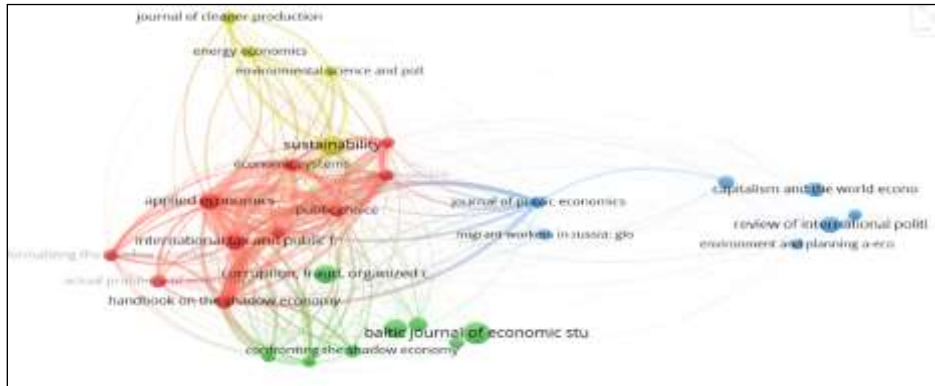


**Figure 2.** Analysis of “shadow economy” in the title of the articles

**Source:** Author’s own composition

Different publishers, conferences and journals are interested in making a scientific contribution to the topic of the shadow economy and thus provide space for scientific publications. In **Figure 3**, created with VosViewer, the journals that have published the most articles on the topic of shadow economy were shown. Particularly noteworthy and worth highlighting is the connection between the various journals, which is created by the citation. A special connection exists on the one hand between the journal "Sustainability" and different journals like "Economic

Systems" or "Environmental Science and Pollution". Also the journal "Corruption, Fraud, Organized Crime, and the shadow economy" has a special connection to "Shadow Economy" or "Public Choice".



**Figure 3.** Journals in relation with “shadow economy” 1975-2021

**Source:** Author’s own composition

During the period from 1975 to 2021, 1,007 scientific journals were interested in publications on the topic of the shadow economy. The ten journals with the most publications are described in the **Table 1**.

**Table 1.** Top 10 journals with publication about shadow economy

Journal	Publication	Citation
Corruption, Fraud, Organized Crime, and the shadow economy	17	454
Sustainability	17	1096
Baltic Journal of Economic Studies	15	253
Capitalism and the World Economy: The Light and Shadow of Globalization	14	424
Journal of Political Economy	13	401
Financial and Credit Activity – Problems of Theory and Practice	12	220
Russian Journal of Criminology	12	312
Journal of Cleaner Production	11	627
2018 IEEE/RSJ International Conference on intelligent Robots and Systems (IROS)	10	179
Environment and Planning A-Economy and Space	10	644

**Source:** Author’s own composition

Note: The analysis period is 1975 – October 2021

However, in addition to the publisher of the scientific papers, the interest and thus the quality of the journal is also of great importance. The interest and the associated quality can be measured in terms of the number of citations. For this reason, **Table 2** lists the journals with the highest number of citations in the period from 1975 to 2021. By far the most cited journal is "Sustainability", which has reached 1,096 citations with 17 articles.

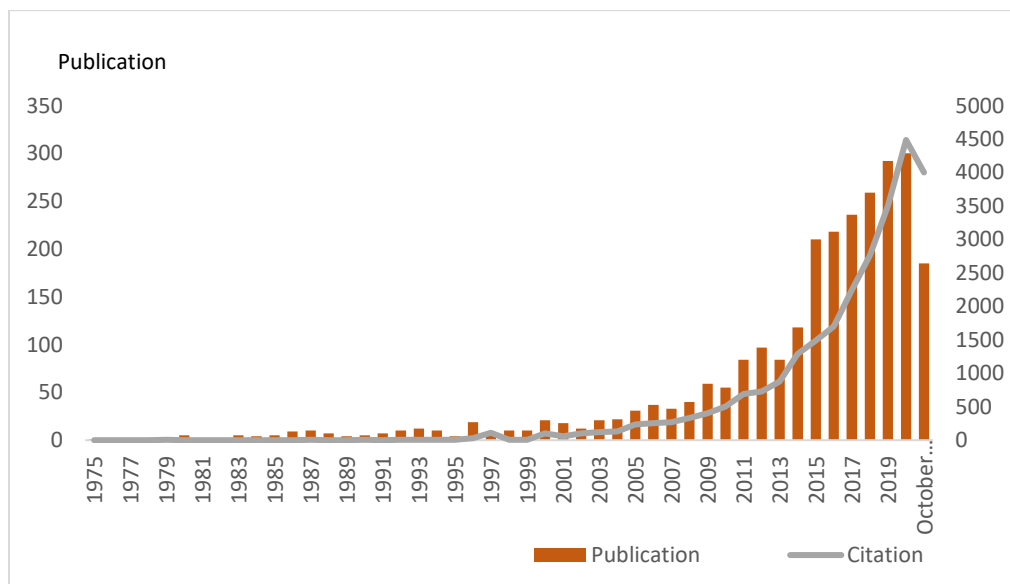
**Table 2.** Top 10 journals with most citation about shadow economy

Journal	Citation	Publication
Sustainability	1,096	17
Review of International Political Economy	712	8
Environment and Planning A-Economy and Space	644	10
Journal of Cleaner Production	627	11
Environmental & Resource Economics	549	5
Journal of Economic Literature	548	2
Urban Studies	539	6
Energy Economics	524	9
Journal of Developmental Entrepreneurship	513	4
Corruption, Fraud, Organized Crime, And the Shadow Economy	454	17

**Source:** Author’s own composition

Note: The analysis period is 1975 – October 2021

The previous analysis was always based on an overall period from 1975 to 2021. The figure below (Figure 4) represents the interest in the form of citation and publication over time. While there was almost no interest until 2005, both publications and citations increased exponentially. Especially in 2019 and 2020, publications and citation were at their peak due to their exponential progression. With this representation, it is clear that the interest has never been higher.



**Figure 4.** Times cited and publication “shadow economy”

**Source:** Author’s own composition

In addition to the publishers presented and the associated citations and publications, the author plays an equally important role. In the following overview, the most active authors in the shadow economy are presented, and the connection between the authors is shown. It becomes clear that the authors Schneider, Williams, Saunoris, but also Achim, and Dell’Anno are the authors, who are very active researchers in the field of the shadow economy. Special

connections exist between Schneider and Williams, but also just as between Schneider and Saunoris. The various other connections can be taken from Figure 5.

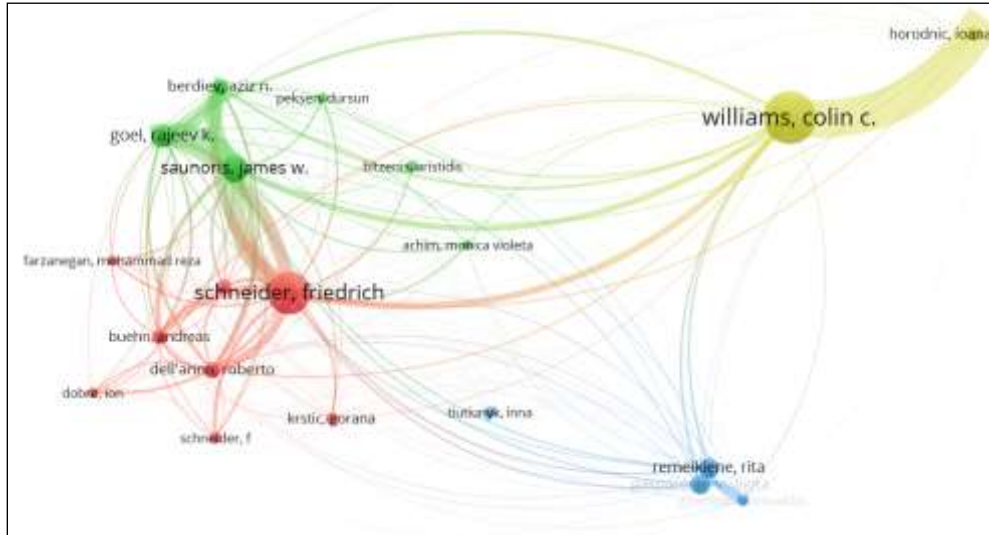


Figure 5. Bibliometric coupling of authors of “shadow economy” papers 1975-2021

Source: Author’s own composition

#### 4. Analysis of shadow economy determinants

There is a comprehensive variety of different influencing variables that have an important effect on the shadow economy. As part of the systematic literature review of existing publications from 1975 to 2021, a graphical representation of the factors influencing the shadow economy that have been studied so far was developed in Figure 6.

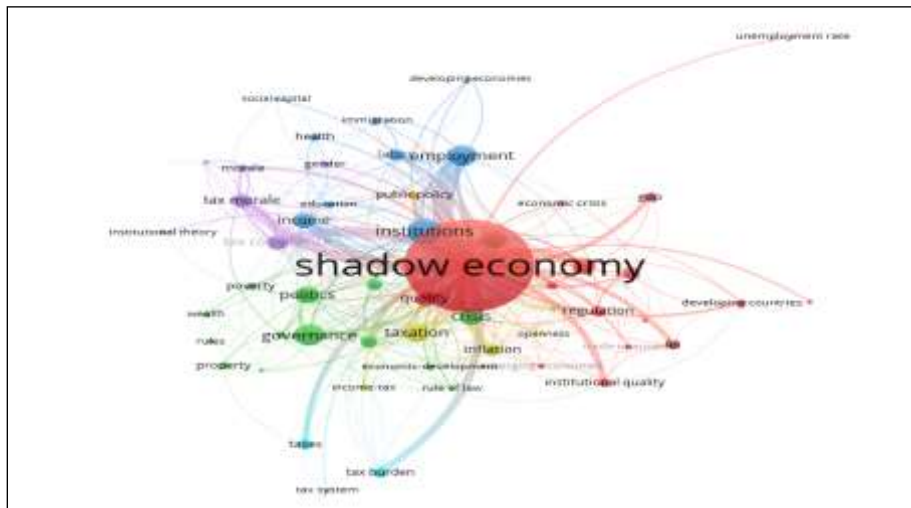


Figure 6. Determinants of shadow economy 1975-2021

Source: Author’s own composition

We have grouped them into three categories: (1) economic determinants; (2) political and institutional determinants; (3) social determinants.

#### 4.1. Economic determinants

The economic factors influencing the shadow economy have been addressed and analyzed in a considerable sum of studies (Table 3). Of the three different areas, this is probably the one that has been studied the most.

**Table 3.** Economic determinants of shadow economy

Factors	Sign	Authors
<b>Economic development: GDP per capita, HDI</b>	-	Johnson et al., (1997)
		La Porta & Shleifer (2008)
		Yalaman & Gumus, (2017)
		Ateşgaoğlu et al., (2018)
		Kelmanson et al. (2019)
		Navickas et al. (2019)
		Wu & Schneider, (2019)
		Baklouti & Boujelbene (2020)
		Achim et al. (2021)
		Poufinas et al. (2021)
Lyulyov et al. (2021)		
<b>Economic growth</b>	-	Mara (2011)
		Borlea et al. (2017)
		Achim et al. (2021)
		Mara (2021)
<b>Economic complexity</b>	+	Le Thanh Ha et al. (2021)
<b>Trade openness</b>	-	Fedajev & Arsia (2017)
		Canh et al. (2021)
<b>FDI</b>	-	Huynh et al. (2019)
		Bayer et al. (2020)
		Canh et al. (2021)
		Lyulyov et. al (2021)
<b>Inflation</b>	+	Mazhar (2017)
<b>Employment rate</b>	-	Bordignon & Zanardi (1997)
		Remeikienė et al. (2018)
		Kelmanson et al. (2019)
		Poufinas et al. (2021)
<b>Income</b>	-	Goel & Nelson (2016)
		Canh & Tanh (2020)
<b>Income inequality</b>	+	Schneider & Enste (2000)
		Chong & Gradstein (2004)
		Winkelried (2005)
		Krstić & Sanfey (2010)
<b>Welfare</b>	-	Ruge (2010)
		Mara (2021)

Source: Author's own composition

The most important catalyst of reducing the shadow economy is the continuous rise of economic development. Many studies comprise this determinant measured by indicators such as GDP per capita and Human Development Index (HDI). Achim et al. (2021); Poufinas et al. (2021); Lyulyov et al. (2021); Baklouti & Boujelbene (2020) and Kelmanson et al. (2019) investigate the impact of GDP per capita on the shadow economy. The results show a negative correlation, which means when GDP per capita increases, activity in the shadow economy decreases. Lyulyov et al. (2021) also confirms the results presented so far and clarifies the exact relationship by concluding that a 10 % increase in GDP per capita cause a 1.2 % decrease in the shadow economy.

In Baklouti & Boujelbene's (2020) work, a distinction was made concerning the relationship between GDP per capita and the shadow economy. The distinction was made between good and poor institutional quality. The study concluded that good institutional quality has a positive effect on the relationship between GDP per capita and the shadow economy, which means that it results in a smaller shadow economy. And in contrast, when GDP per capita increases, an institution with poor quality may favor the extent of the shadow economy.

Berdiev & Saunoris (2018) and Berdiev et al. (2018) find that economic freedom can play a major role. Economic freedom is a complex concept measured by the Index of Economic Freedom.

Looking more closely at GDP and thus productivity, Kelmanson et al. (2019) and La Porta & Shleifer (2008) found that an increase in productivity is also associated with a reduction in the informal economy.

Wu & Schneider (2021) found a negative correlation between GDP per capita and the shadow economy, but exclusively related to less developed economies. With the study, a U-shaped relationship was found, which states that the shadow economy increases as soon as the GDP per capita exceeds a certain limit. With this article, it was clarified that the GDP per capita can have both positive and negative effects on the shadow economy in the context of a less developed economy.

The employment rate also represents an important factor with a great influence on the shadow economy (Bordignon & Zanardi (1997); Remeikienė et al. 2018). Upon closer examination, the study by Remeikienė et al. (2018) reveals that the employment rate runs counter to the shadow economy, thus confirming a negative correlation. When the employment rate decreased by 1, increases the level of the shadow economy by 0.0345.

Similarly, Poufinas (2021); Canh et al. (2020), and Kelmanson et al. (2019) found a concurrent effect between the unemployment rate and the shadow economy, confirming a positive relationship. It can be concluded from this that the share of unemployed people would like to secure their financial income with the help of activities in the underground economy.

The interaction between income distribution and the shadow economy is also a much-discussed relationship influencing factor. The overwhelming view on this confirms the hypothesis that increased income inequality favors the size of the shadow economy (Chong & Gradstein, 2004; Winkelried, 2005; Krstič & Sanfey, 2010). A contrary view is taken by Schneider & Enste (2000), who believe that higher-income workers have to pay more social security contributions due to the existing social security system and therefore have a higher incentive to engage in activities in the shadow economy.

Studies (Canh & Tanh, 2020) on the level of income show that a high level of income minimizes activity in the shadow economy, creating a negative effect. The correlation between shadow economy and welfare is analyzed by Ruge (2010), Schneider & Williams (2013), and Mara (2021). In this context, as important determinants are considered wages, unemployment, and social protection expenditures. The findings suggest that welfare has a significant impact on the decline of the shadow economy. Comparable results are represented by Goel & Nelson (2016), who find a negative correlation between economic welfare and the shadow economy. The reasons for this are the unattractiveness of the shadow economy for economic prosperity in the context of the relationship between risk and potential gain.

The influence variable of foreign direct investment (FDI) on the shadow economy is discussed in a large number of studies. And a predominantly strong negative relationship of FDI on the shadow economy is found Canh & Tanh, (2021), Huynh et al. (2019), and Bayer (2020). Lyulyov et al. (2021) state that a 10% increase in FDI reduces the shadow economy by 0.5%. Canh et al. (2021) elaborate on their results by finding a negative effect in FDI inflows in the short run, but a positive effect in the long run.

When analyzing the impact of trade openness on the shadow economy, Canh et al. (2021) found an opposite effect. This negative effect holds in both the short and long run. The findings of Canh et al. (2021) were confirmed by other studies such as Goel et al. (2019) and Fedajev & Arsiæ, 2017. In addition to trade openness, the complexity



of the economy is also an important factor for the shadow economy. The researcher Le Thanh Ha et al. (2021) deals with this topic and found a negative correlation. The influence of economic complexity on the shadow economy is mainly evident in the long run and for countries with high-income levels.

Inflation is another influential instrument in the shadow economy. Mazhar (2017) confirms a positive effect between inflation and the shadow economy.

Borlea et al. (2017) and Mara (2011) studied the influential relationship between the shadow economy and economic growth and found a strong negative correlation. Achim et al. (2021) and Mara (2021) found that higher development of the economy leads to a reduction in the level of the shadow economy.

#### 4.2. Political and institutional determinants

A comprehensive number of studies analyze the drivers of the shadow economy (**Table 4**). And among them, in the context of policy conditions, institutional quality is considered as one of the most important factors (Dreher & Schneider, 2009; Torgler & Schneider, 2009 and Elbahnasawy et al. 2016). The countervailing influence of institutional quality on the shadow economy, and thus a negative correlation, is confirmed in various studies (Mara, 2021; Canh et al., 2021; Torgler, 2009 and Bovi & Dell’Anno, 2010). A long-term cointegration between institutional quality and shadow economy as well as a heteroskedastic effect has been identified (Canh et al. 2021). In addition, Canh et al. (2021) and Alarcón-García et al. (2020) argue that the influence of institutional quality has a heterogeneous character. One explanation is that, in the short term, there is a negative interaction between corruption control and the rule of law. While in the long run, political stability has a negative impact on shadow economy.

**Table 4.** Political determinants of shadow economy

Factors	Sign	Authors
<b>1. Tax factors</b>	-	Alm et al. (2006)
<b>Tax morale</b>		Kirchler (2007)
		Torgler (2009)
<b>Tax burden</b>	-	Ruge (2010)
		Huynh & Nguyen (2020)
<b>Tax level</b>	+	Mazhar (2017)
		Enste (2018)
		Lyulyov (2021)
<b>Tax complexity</b>	+	Rajeev & Nelson (2016)
<b>Tax policy</b>	-	Huynh & Nguyen (2020)
<b>2. Government</b>	-	Bovi & Dell’Arno (2010)
<b>Quality public governance</b>		Achim et al. (2018)
		Enste (2018)
		Baklouti & Boujelbene (2019)
<b>Institutional quality</b>	-	Bovi & Dell’Arno (2010)
		Torgler (2009)
		Alarcón-García (2020)
		Canh et al. (2021)
		Mara (2021)
<b>Rule of law</b>	-	Alarcón-García (2020)
		Canh et al. (2021)

**Source:** Author’s own composition

Achim et al. (2018), Enste (2018), and Bovi & Dell'Anno (2010) confirmed a negative relationship between the shadow economy and the quality of public governance. Also, Baklouti & Boujelbene (2019) find that countries with low levels of political stability have significantly higher urges to work in the shadow economy.

With the help of a survey by Žukauskas (2018), the public perception on the reasons for illegal purchases was analyzed and evaluated. Results show that the high cost of purchased goods and services (89% of respondents) is listed as one of the reasons that lead to engaging in the shadow economy. It can be concluded that the price difference between the taxed goods and the non-taxed goods drives people to take the illegal route. This means that 89% of the respondents consider taxation as a driver for being active in the shadow economy.

Based on these much-studied influencing factors the shadow economy include taxation and all its related issues. In his study, Arsić et al. (2015) discuss that the biggest influencing factors in this area are the size and structure of the tax burden, the efficiency of tax administration, the complexity, and the related equality, and lastly the verification of compliance. There are several confirmations of the statement of Arsić et al. (2015). Some studies have found that there is a positive correlation between the tax burden and the shadow economy (Lyulyov, 2021; Mazhar, 2017; Enste, 2018). Lyulyov (2021) demonstrates that a 10% increase in the tax level results in a 1% increase in the shadow economy.

Rajeev & Nelson (2016) also examined the impact of tax levels on the shadow economy and found that it is predominantly the complexity of the tax code that is a driver of the shadow economy. They particularly emphasize that tax rates or the overall level of taxation are not the main drivers of the shadow economy, as is often erroneously assumed.

Mara (2011) and Torgler (2009) also cite tax morale as an important factor that is negatively related to the shadow economy. The literature has found that tax morale is strongly associated with the quality of the public sector. Taxpayers agree to pay taxes honestly if they receive a corresponding benefit from the public service. In scientific terms, higher tax morale is positively associated with tax honesty, resulting in less tax evasion, undeclared work or other financial crime (Kirchler, 2007; Alm et al., 2006).

When considering the policy factors influencing the shadow economy, Huynh & Nguyen (2020) find that the shadow economy is negatively affected by changing tax policies that are reactive and thus proactive, and positively affected by a passive tax policy. Authors like Johnson et al. (1997); Gërxhani (2004); Loayza et al. (2009) and Schneider & Enste 2000 also argue that the tax burden affects the size of the shadow economy. In particular, Huynh & Nguyen (2020) and Ruge (2010) find that the tax burden increases the activity in the shadow economy. A closer look at indirect and direct taxation reveals that the levying of indirect taxes exerts a stronger influence on the shadow economy than direct taxes.

Another interesting policy criterion is the hypothesis examined by Achim & Borlea (2020, p. 162) that a high quality of banking system soundness leads to a reduction in the shadow economy's size.

#### *4.3. Social determinants*

In addition to the aforementioned influencing factors, there are also influences from the cultural sphere on the shadow economy (**Table 5**). For example, according to Richardson (2008) and Schneider et al. (2015), religion can be identified as an increasing factor. In his study, Richardson (2008) examined the influencing factor of religion in more detail and found a negative correlation to the shadow economy. These findings can be confirmed by Stack et al. (2006). It was found that as religiosity increases, the shadow economy steadily decreases. This is due to the assumption that religion appeals to honest and trustworthy actions, thus promoting and demanding moral values.

**Table 5.** Social determinants of shadow economy

Factors	Sign	Authors
Gender men	+	Goel & Saunoris (2017)
Happiness	-	Schneider et al. (2004) Berheim (2007) Thießén (2010) Schneider (2015) Achim et al. (2018)
Religion	-	Stack et al. (2006) Richardson (2008) Schneider et al. (2015)
Inequality	+	Dell'Anno (2016)

**Source:** Author's own composition

In addition to the influence of religion, happiness also represents an important factor on the shadow economy. Studies such as Achim et al. (2018); Thießén (2010); Bergheim (2007); Schneider (2015) and Schneider et al. (2004) elaborated a link between happiness and the shadow economy. When looking at the extent of the influence of happiness on the shadow economy, a negative influence can be found. The basic idea is that happier people are more likely to act honestly, which leads to a reduction in the shadow economy.

To complement research on determinants such as happiness and religion, Goel & Saunoris (2017) looked at gender differences in the propensity to work in the shadow economy. The results show that unemployed men are more likely to work in the shadow economy than unemployed women.

Lastly, we address inequality, which has been further examined through the work of Dell'Anno (2016). His work examined the impact of inequality on the shadow economy and found that there is a positive correlation, meaning that if the population's perception of inequality increases, activity in the shadow economy increases.

## 5. Conclusion

The main objective of this inquiry is to review the phenomenon of the shadow economy and to identify its determinants with great significance from an economic, political, and social perspective.

As bibliometric analysis revealed the shadow economy is highly debated in the last decades and many authors try to clarify the coverage of this concept. Based on this analysis we try to underline the importance of the determinants of the shadow economy to provide a starting point for future policies adopted by the governments in the fight against the shadow economy.

As a future direction for the study, we intend to realize an extended analysis of the consequences of the shadow economy considering the same economic, political, and social perspectives.

The map of terms correlated with shadow economy reveals some novel concepts such as immigration, education, and cybercrime. We can state in this context the necessity for deep analysis regarding these new facts and mapping the new trends of government policies in accordance with this.

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### *Declaration of Competing Interest*

The authors of this paper certify that there is no financial or personal interest that could have appeared to influence the work reported in this paper.

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