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45/2023

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## **The underground economy: an exploration of components, size, causes and effects**

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**Abstract.** The underground economy, which includes unlawful activities such as fraud, illegal labour, and crime, has received much attention because of its economic and social growth consequences. This article will analyze the underground economy's components, size, causes, and impacts. The study employs comprehensive econometrics, statistical research, quantitative approaches, and real-world data from numerous countries. This study offers insight into the scale of the underground economy and its impact on society by examining descriptive statistics and doing cross-sectional studies. The underground economy is a vast and complex system encompassing various activities, from tax evasion and benefit fraud to counterfeiting and financial scams. It is estimated that the underground economy accounts for up to 30% of global GDP and can significantly impact economic growth, tax revenue, and public safety. The subsequent chapter examines the components of the underground economy, including fraudulent activities, counterfeit goods, and financial scams. It also discusses the challenges of detecting and preventing underground economic activity and the potential consequences of the underground economy for society. The paper calls for a more comprehensive approach to combating the underground economy, including measures to strengthen law enforcement, improve financial regulations, and educate the public about the risks of underground economic activity. This study investigated the relationship between the size of the population and the size of the underground economy in OECD countries. A quantitative research approach was used, and data were collected from secondary sources. The data were analyzed using SPSS software and EXCEL. The results showed a positive, linear relationship between the population and the underground economy. A stratified sampling method to collect data from OECD countries was used, where the data sources included government reports, tax records, academic research, and international databases. The data was analyzed using a simple linear regression model. The study concluded that there is enough evidence at a 95% confidence interval to suggest that the size of a country's population is directly proportional to the size of its underground economy.

**Keywords:** Underground economy, fraud, illegal work, crime, benefit fraud, counterfeit goods, financial scams, criminal activities, tax revenue loss.

### **Introduction**

Fraud, unlawful employment, and crime are just a few illicit activities that make up the underground economy, which is a complicated and diverse issue. This commentary aims to comprehensively examine the underground economy, shedding light on its components, estimating its size, exploring the causes behind its existence, and analyzing its effects on the formal economy.

Various illegal actions outside a nation's legal system's formal economy are called the underground economy (Baklouti and Boujelbene, 2020.) This article thoroughly analyses the shadow economy and assesses how it affects the mainstream economy.

In 2021, the U.S. Department of Labor confronted such an occurrence that ultimately resulted in successfully retrieving \$1.1 million for one thousand employees employed by a temporary staffing company in California. Such recoveries can serve as an excellent example for other companies that may fall into unethical employment practices whereby their workers' fair compensation is unlawfully compromised.

According to the DOL inquiry, Labour Ready had routinely misclassified its employees for years. The company would hire employees as independent contractors, but they would still be expected to work a defined schedule, abide by company policies, and utilize company property (Blanton and Peksen, 2019.) The personnel are required to carry corporate identification and wear uniforms.

### **Literature Review**

In March 2023, U.S. Customs and Border Protection (CBP) made a startling discovery at the Port of Los Angeles - counterfeit Apple AirPods worth \$1.2 million had been confiscated. Upon investigation, it was revealed that these fake AirPods were smuggled into the country as part of a shipment labelled as "earphones" from China (Baklouti and Boujelbene, 2020.)

At the Port of Los Angeles in March 2023, U.S. Customs and Border Protection (CBP) confiscated counterfeit Apple AirPods valued at \$1.2 million. It is noted that the fake AirPods were included in a shipment from China that was labelled as "earphones." The AirPods were presented in fake Apple boxes and had fake Apple logos. Because they violated Apple's intellectual property rights, the CBP seized the fake AirPods.

The underground economy in Qatar contributes an average of around 17.03 per cent of the nation's official gross domestic product (GDP), according to the Journal of Financial Crime 2019 (Kemsley, Kemsley, and Morgan, 2023). It is estimated that the average rate of tax evasion is around 16.50%, or roughly 2.12% of the official GDP when expressed as a proportion of all non-oil tax receipts. Estimates indicate that 26.70% of the money flowing from the banking industry is illegal.

As of 2022, 37 states and D.C. have legitimized the use of the plant for therapeutic purposes. Its use cuts across many culinary products and topical and oral medications. By the time 2022 rolls around, it is expected that non-medical cannabis will be legal in 18 states across America.

In 2022, if one earns money through babysitting, it is essential to note that the Internal Revenue Service (IRS) now regards those earnings as taxable self-employment income. It is mandatory for individuals who earn more than \$400 in a year from babysitting jobs to include these earnings on their tax return filings. The most recent data reveals that a significant portion of cigarette sales in New York resulted from covert economic activity, comprising

approximately 53.2% of overall sales in 2018. Despite being legal, tobacco sales in New York City are sometimes unregistered or made "under the table" due to the high sin tax on the product.

The issue of benefit fraud is getting worse in the U.S. According to government estimates, nationwide benefit fraud cost taxpayers \$100 billion in 2020. This large sum of money may go toward supporting crucial initiatives and offerings.

Investigating illicit activities can undeniably yield immense profits, particularly for individuals involved in the drug trade, human trafficking, corruption, and fraud. By hiding their trustworthy source and adding a veneer of legitimacy, money laundering offers a way to legitimize these monies (Achim & Borlea, 2020). The placement, layering, and integration stages are frequently included in this process (Hossain, 2023). Placement is the act of introducing illegal monies into the financial system, layering is the process of concealing the money trail through complex transactions, and integration is the process of fusing the laundered cash with legal assets.

Money laundering poses significant challenges for law enforcement and financial institutions. Detecting and preventing money laundering requires robust regulatory frameworks, financial intelligence units, and cooperation among different jurisdictions (Hossain, 2023). Anti-money laundering measures work towards several objectives. These include disrupting the financial networks that enable criminal activities, safeguarding the financial system's integrity, and ensuring transparency and accountability. All these goals are critical to maintaining economic stability and global security in today's fast-paced world.

In early March, the American Department of Justice announced that Jianjun Li, former CEO of a Chinese real estate company, has been charged with money laundering and other offences. According to the DOJ's allegations, Mr Li laundered over \$100 million in gains due to participating in a bribery conspiracy with an agent from the Chinese government. Mr Li is accused of utilizing a network of shell companies and bank accounts to conceal the source and destination of these illicit funds before purchasing extravagant properties across the United States.

## **1. Components of the Underground Economy**

### ***1.1. Fraudulent Activities***

#### *Tax Evasion and Tax Fraud*

The two activities are fraudulent activities involving the illegal avoidance or reduction of taxes owed to the government. Individuals and businesses use various schemes to hide or under-report their income, manipulate their expenses, falsely claim deductions pay less in taxes or evade their tax obligations (Kemsley, Kemsley, and Morgan, 2023) entirely.

#### *Benefit Fraud*

Benefit fraud is a deceitful act done by specific individuals who deliberately provide misinformation or withhold details to obtain benefits from the government that they are not entitled. Some of these benefits may include, but are not limited to, welfare payments, unemployment benefits, disability compensation, healthcare subsidies, and governmental assistance. This crime involves cheating the system and depriving those needing aid while wasting taxpayers' money.

It can be done through identity theft, forging documents, or cooperation with others to deceive government agencies responsible for distributing benefits. Benefit fraud directly undermines the effectiveness of social welfare programs.

### *Counterfeit Goods*

Counterfeit goods are unauthorized replicas or imitations of genuine products, often produced and sold in the underground economy (Mussanova, 2021). Counterfeiters aim to deceive consumers by copying trademarks, packaging, and designs to create counterfeit versions of famous brands and products.

The illegal production and sale of counterfeit goods are prevalent in today's market. From trademark infringement to intellectual property theft, these items undergo production and sale illicitly, causing harm to both consumers and legitimate businesses. Counterfeit items encompass an extensive array of products ranging from high-end designer handbags, watches, and clothing to everyday commodities such as electronics, medications, and auto parts.

The demand for less expensive substitutes and the possibility for substantial profits fuel the growth of the black market for counterfeit goods. (Mussanova, 2021). Fake products may initially seem like a steal, as they often cost less than their authentic counterparts. However, one must recognize their potential harm to consumer health and safety. Since many illicit goods do not undergo the same rigorous quality control measures that genuine manufacturers enforce, product reliability is not guaranteed.

### *Financial Scams*

Financial scams are a pervasive issue that affects numerous individuals, often resulting in substantial losses. These fraudulent activities are typically carried out by individuals or organizations intending to profit illegally at the expense of vulnerable victims (Kemsley, Kemsley, and Morgan, 2023). Through fraudulent means, such as preying on their victims' confidence and frailty, these perpetrators trick people into giving them access to their personal information and finances. Here are some common types of financial scams:

- *Phishing*: Phishing scams involve sending phoney emails or communications that seem to be from reliable sources, such as banks, respected enterprises, or government organizations (Binha, Parkb, and Wooo 2018.) Under the guise of updating account information or fixing critical issues, these mailings frequently request personal information.
- *Advance-fee fraud*: In the often nefarious digital world, there is a common scam known as advance-fee fraud, also referred to as "419 scams" or "Nigerian prince scams." These tactics typically begin with an email or message that claims the sender has access to a significant amount of money that they need assistance transferring out of their country - but be aware! As with many other schemes in the online space, this particular one frequently relies on phoney promises and misleading requests.
- *Ponzi schemes*: Ponzi schemes are dishonest investment schemes that use money from new participants to give returns to earlier investors. Typically, the con artist guarantees substantial returns at low risk. The operator disappears with the remaining cash as the scam implodes due to a lack of fresh participants. Ponzi schemes are unsustainable and can cause participants to suffer significant financial losses.
- *Pyramid schemes*: Pyramid schemes are similar to Ponzi schemes but involve recruiting participants to invest in a business opportunity rather than relying solely on investment returns. Participants are encouraged to recruit more people into the system and earn commissions based on the recruitment efforts (Binha, Parkb, and Wooo 2018.) As the scheme grows, it places more and more pressure on its recruits to earn a profit, often resulting in significant financial losses for most involved.



- *Theft of identity*: Identity theft is a crime that can devastates victims. When someone has access to information like SSNs or account details, they can use that data to enact unauthorized transactions or open accounts in the victim's name. This kind of fraud often leaves individuals with debts they did not consent to and can damage their credit|.
- *Investment fraud* involves deceitful practices in the financial markets, where scammers entice individuals with false or exaggerated claims about investment opportunities. They may promise high returns with minimal risk or use complex strategies to mislead investors. These scams can involve stocks, real estate, commodities, cryptocurrencies, or other investment instruments.
- *Fake charities*: Scammers may create simulated charitable organizations to exploit people's goodwill and generosity. They often use natural disasters, public health crises, or emotional stories to solicit donations. However, the money collected rarely reaches the intended beneficiaries, and instead, it goes into the scammers' pockets.

### ***1.2. Illegal Work***

Illegal work refers to any employment or labour activity that violates the laws and regulations of a particular jurisdiction. It involves engaging in work or employment practices that are considered unlawful or unauthorized (Kemsley, Kemsley, and Morgan, 2023). Three specific examples of illegal work are undeclared employment, human trafficking and exploitation, and black market labour.

#### *Undeclared Employment*

Undeclared employment refers to work or career not reported to the relevant authorities, such as tax authorities or labour regulators. This type of employment is also commonly known as informal or unrecorded employment. The undeclared job typically involves individuals who need proper registration, licensing, or compliance with legal and regulatory obligations. Frequently, individuals working in domestic work, construction, agriculture, and small-scale businesses experience wage theft.

There are several reasons why undeclared employment exists within the underground economy:

- *Tax evasion*: Individuals who engage in unreported employment reduce their financial commitments to the government by avoiding paying taxes on their income.
- *Avoidance of labour regulations*: Undeclared employment allows employers to circumvent labour regulations, such as minimum wage laws, working hour restrictions, safety standards, and social security contributions. It enables them to cut costs and maximize their profits.
- *Lack of social protections*: When workers engage in undeclared employment, they may unknowingly forfeit social protections and benefits such as health insurance, retirement, and unemployment benefits. This lack of protection can lead to financial hardships and restricted access to vital social services. Without these benefits, individuals are left vulnerable and vulnerable to the risk of exploitation in their workplace. Unfortunately, this issue disproportionately affects those already marginalized within society - making it even more urgent that reform takes place to protect the well-being of all members.
- *Informal arrangements*: Unofficial agreements between employers and employees, which lack formal contracts or legal protections, are a common feature of undeclared

employment. It might result from low pay, unpleasant working conditions, and a lack of job security.

The consequences of undeclared employment in the underground economy are employment multi-faceted. On the one hand, it can contribute to economic growth by providing opportunities, particularly in regions where formal job opportunities may be limited. On the other hand, it can undermine the formal economy and public finances (Gamal, Dahalan, and Viswanathan, 2019.) It reduces tax revenues, creates unfair competition for businesses operating legally, and hampers the implementation of labour regulations.

Governments and policymakers strive to address undeclared employment by implementing measures to encourage formalization and compliance. These measures may include stricter enforcement of labour and tax laws, promoting awareness campaigns, providing incentives for formalization, and improving access to social protections for workers.

#### *Human Trafficking and Exploitation*

Human trafficking consists of heinous acts, which usually entail recruiting, transporting, transferring, or harbouring individuals through force, coercion, or deception to be exploited for various purposes (Amalia et al., 2019). Egregiously enough, these offences constitute a gross human rights violation and are deemed deplorable by modern societies. Furthermore, traumatically common exploitation tactics include forced labour, sexual exploitation, forced begging, and involuntary servitude of people who are often vulnerable and disenfranchised.

Armed conflict, poverty, inequality, and organized crime are leading factors that foster human trafficking worldwide. The scars left by war-torn nations contribute heavily to the pervasive nature of modern-day slavery, as it often forces groups from their homes and into the arms of traffickers. (Akhmedshina, 2020) Efforts by governments, international organizations, and civil society aimed at combating human trafficking, protecting victims, and prosecuting traffickers.

Despite government and nonprofit attempts to combat it, human trafficking and exploitation are still widespread today (Nemeth and Rizo, 2019.) According to the ILO (international labour organization), there are an estimated 24.9 million victims of modern slavery, including those who are compelled to do forced labour and are forced to engage in forced sexual exploitation.

Type of Exploitation	Victims	Region
Sexual exploitation	Women & Girls	Asia, Africa & Latin America
Forced labour	Men, Women, 7 Children	All regions of the world
Forced marriage	Girls & Young Women	All regions of the world
Organ trafficking	Men & Women	All regions of the world
Forced criminality	Children	All regions of the world

#### *Black Market Labor*

Black market labour refers to work outside the boundaries of legal labour markets. It involves unregulated, untaxed employment and is hidden from official records. Black market labour can encompass a wide range of activities, including jobs in construction, agriculture, domestic work, and manufacturing (Amalia et al., 2019). Black market workers typically lack legal protections, fair wages, and safe working conditions.

Employers may exploit these workers by paying meagre wages, demanding long hours without overtime compensation, and disregarding health and safety regulations (Blanton and

Peksen, 2019.) Black market labour harms workers and undermines the economy by eroding tax revenues and distorting market dynamics (Gamal, Dahalan, and Viswanathan, 2019.) Governments combat this issue through enhanced labour market regulation, enforcement, and efforts to promote formal employment.

### ***1.3.Criminal Activities***

#### ***Drug Trade***

The drug trade is a significant component of the underground economy and involves producing, distributing, and selling illegal drugs. This illicit market encompasses many substances, including narcotics, stimulants, hallucinogens, and prescription drugs sold without proper authorization (Spindle, Bonn-Miller, and Vandrey 2019). The drug trade operates clandestinely, often exploiting hidden networks and secret channels to avoid detection by law enforcement agencies.

The underground drug trade has severe social and economic implications. It fuels addiction, contributes to spreading diseases like HIV/AIDS, undermines public safety, and generates violence and organized crime (Spindle, Bonn-Miller, and Vandrey 2019). Drug cartels and criminal organizations play a central role in controlling the production and distribution of drugs, creating a complex network of suppliers, dealers, and consumers. Profits from the drug trade are used to fund other criminal activities and corrupt officials, further perpetuating the cycle of crime and instability.

Efforts to combat the drug trade involve law enforcement operations, international cooperation, and drug prevention and treatment programs. However, due to the lucrative nature of the market and the constant adaptation of drug traffickers, eradicating the underground drug economy remains a significant challenge (Spindle, Bonn-Miller, and Vandrey 2019).

#### ***Money Laundering***

Money laundering is a complex process that involves the concealment of unlawfully obtained revenue. This process furnishes criminals with an opportunity to disguise illicit funds and make it seem like they originated from legal sources. When one thinks of money laundering, the underground economy immediately comes to mind - and for a good reason. Money laundering enables organized criminal activities and facilitates the integration of filthy lucre into the formal financial system (Kemsley and Morgan, 2023.)

#### ***Organized Crime Networks***

Organized crime networks are intricate structures formed by groups of individuals engaged in criminal activities for profit and power. These networks operate covertly and are involved in various illicit ventures, including drug trafficking, human trafficking, smuggling, extortion, illegal gambling, and more (Nemeth and Rizo, 2019.) They often have hierarchies, specialized roles, and well-defined chains of command.

Organized crime networks are central to coordinating and profiting from criminal activities. These networks adapt to changing circumstances, exploit legal loopholes, and establish connections with corrupt officials or other criminal organizations. They thrive on the secrecy and lack of oversight inherent in the underground economy.

The fight against organized crime networks demands a multifaceted approach. It involves amalgamating various forces, such as law enforcement agencies, intelligence gathering teams, and prosecution and prevention units. An international collaboration between the authorities responsible for these facets becomes imperative in obliterating transnational criminal networks. On top of all this, addressing the root causes of this menace is significant while countering its growth. One important recommendation is to take on the social and economic factors that fuel

its growth. For instance, reducing poverty, lack of education, and poor governance, contribute to the growth of organized crime.

## **2. Country-Specific Analysis and Cross-Sectional Comparisons**

The use of particular methodology and data sources is required to estimate the underground economy's magnitude. Various approaches and techniques are employed to capture and measure hidden economic activities (Schneider, 2018). These methods can include:

- *Indirect Methods:* These methods rely on statistical techniques that indirectly infer the size of the underground economy by examining factors such as discrepancies between official and unofficial data, discrepancies in national accounts, currency demand, and other indicators (Binha, Parkb, and Wooa, 2018.)
- *Specific Indicators:* Researchers might also use indicators associated with underground economic activities. For instance, they might examine the scale of the black market, the level of undocumented employment, or the prevalence of unofficial enterprises (Tran et al., 2022).
- *Surveys and Interviews:* Surveys and interviews are conducted to gather data directly from individuals engaged in underground economic activities. It can involve targeted surveys or interviews with specific groups or sectors with significant underground economic involvement.
- *Tax Gap Analysis:* Another approach involves analyzing the disparity between the tax remittances collected by the government and the amount that would be collected if all economic activities were accurately reported (Raczkowski and Mróz, 2018). Examining the tax gap can shed light on the shadow economy's size.

Government documents, official statistics, household surveys, company surveys, tax records, and other pertinent datasets may be used to estimate the underground economy's scale (Enste, 2018). Researchers analyze country-specific data, policies, and economic factors that influence the extent of underground economic activities (Bayar and Öztürk, 2019). Factors considered include the tax system, regulatory environment, levels of corruption, cultural norms, enforcement mechanisms, and other country-specific variables that affect the underground economy.

## **3. Causes of the Underground Economy**

### **3.1. Economic Factors**

Economic factors play a significant role in driving the underground economy. They include:

- *High Taxation:* High tax rates and burdensome regulations can incentivize individuals and businesses to evade taxes and engage in underground economic activities (Blanton and Peksen, 2019.) When taxes are excessively high, people may opt to operate informally to avoid paying taxes or reduce their liabilities.
- *Economic Recession or Unemployment:* During economic downturns or periods of high unemployment, formal job opportunities may become scarce. In such situations, individuals may turn to informal or underground activities as a means of survival or to generate income (Blanton and Peksen, 2019.) The underground economy offers alternative employment options in times of economic hardship.
- *Poverty and Inequality:* The emergence of a shadow economy is linked to poverty and income disparity. People may commit illegal acts to make a living in countries with a significant gap between the rich and the poor. These activities frequently offer a way to

financially obtain goods and services that might otherwise be out of reach through official methods.

### **3.2. Institutional Factors**

Institutional factors are the legal, regulatory, and governance frameworks that influence the underground economy. They include:

- *Complex and Burdensome Regulations:* Complex laws and red tape can make it difficult for individuals and enterprises to function in the formal sector. Compliance costs and administrative hassles may drive certain actors to participate in informal or underground activities to avoid formalization complications.
- *Weak Law Enforcement and Corruption:* Weak law enforcement and high levels of corruption can facilitate the growth of the underground economy. When authorities fail to enforce regulations effectively or are involved in corrupt practices themselves, it creates an environment where underground economic activities can flourish with minimal risk of being caught or punished.

### **3.3. Socio-cultural Factors**

Socio-cultural factors encompass social and cultural norms, attitudes, and behaviours that influence the underground economy. They include:

- *Trust Issues:* Individuals may prefer informal networks and transactions in societies lacking trust in formal institutions. They might rely more on informal agreements and social networks than on official agreements and established legal systems, which would fuel the expansion of the black market.
- *Cultural Acceptance:* Informal economic activity may be more socially acceptable or normal in some cultures. By lowering the stigma attached to engaging in unofficial or illegal activities, this cultural acceptance can aid in the survival and expansion of the underground economy.
- *Informal Social Networks:* Informal social networks, such as family and community ties, can play a role in facilitating underground economic activities. These networks provide support systems and channels for information and resources, enabling individuals to operate informally and evade formal regulations.

## **4. The Effects of the Underground Economy**

### **4.1. Impact on Government Revenues and Public Services**

This phenomenon has several effects on government revenues and public services:

- *Tax Revenue Loss:* The underground economy deprives governments of tax revenue they would have otherwise collected if the activities were conducted through legal channels. Individuals and businesses involved in the underground economy evade taxes by not reporting their income or engaging in tax fraud (Binha, Parkb, and Wooo, 2018.) This loss of tax revenue limits the government's ability to fund public services such as healthcare, education, infrastructure development, and social welfare programs.

Year	Tax Revenue (in Billions of USD)	Underground economy (as a % of the GDP)	Estimated Loss in Tax Revenue (in billions of USD)
1. 2020	2. 3.2T	3. 10.1	4. 396B
5. 2021	6. 3.9T	7. 10.7	8. 468B
9. 2022	10. 4.2T	11. 11.0	12. 546B

- *Strained Public Services:* With reduced tax revenue, governments need help providing adequate public services. More funding is needed to ensure the quality and availability of essential services like healthcare, education, public transportation, and public safety. (Baklouti and Boujelbene, 2020). As a result, the general population may experience a decline in the quality and accessibility of these services.
- *Increased Budget Deficits:* When underground economic activities expand, and tax evasion becomes prevalent, governments may experience more significant budget deficits (Binha, Parkb, and Wooa, 2018.) The shortfall between tax revenues and expenditures can lead to increased borrowing, accumulation of public debt, or cuts in public spending, further exacerbating the strain on public services.

#### **4.2. Distortion of Market Competition**

The underground economy can distort market competition by creating an uneven playing field for businesses. The following effects are observed:

- *Unfair Competition:* Businesses operating in the underground economy often avoid complying with regulations, such as licensing requirements, labour laws, safety standards, and taxation. It gives them an unfair advantage over businesses that operate legally and incurs the associated costs (Tran et al., 2022.) Legal businesses need help to compete against underground operators who can offer lower prices due to their evasion of taxes and compliance costs.
- *Market Distortions:* A significant underground economy can lead to imbalances in supply and demand. Underground businesses may flood the market with cheap and unregulated goods or services, undermining legitimate businesses. It can result in price distortions, decreased profitability for legal businesses, and even the displacement of compliant enterprises from the market.
- *Stifled Innovation:* The underground economy often operates without violating intellectual property rights and patent laws. It can discourage innovation, as businesses may hesitate to invest in research and development when their inventions and products can be easily copied and sold in the underground market without consequences.

#### **4.3. Erosion of Trust and Social Capital**

The underground economy can erode trust and social capital within a society, leading to various negative consequences:

- *Weakening of Social Cohesion:* When individuals and businesses engage in underground activities, it undermines the principles of fairness, honesty, and trust that form the foundation of a well-functioning society (Tran et al., 2022.). The perception of a widespread underground economy can erode trust among citizens, weakening social cohesion and cooperation.

- *Reduced Trust in Institutions:* A booming underground economy might make people less confident in governmental authority and the rule of law. People lose faith in the effectiveness and fairness of the legal system and regulatory authorities when they see rampant tax evasion, corruption, and criminal actions unpunished (Blanton and Peksen, 2019).
- *Increased Crime and Informality:* Money laundering, drug trafficking, and people trafficking are all common occurrences in the underground economy. The proliferation of illegal and unregulated activities may increase overall crime rates. Furthermore, the predominance of the underground economy can sustain informal employment, in which employees lack legal protections and social security benefits, aggravating socioeconomic inequities.

## **Methodology**

### *Research Type*

The research type used was quantitative research which involved the systematic collection and analysis of numerical data (population and the percentage of the underground economy) in studying various aspects of informal economic activities outside the purview of official regulations and taxation systems. This research aims to understand underground economic activities' size, nature, participants, and economic impact.

### *Hypothesis*

The hypothesis tested in this research was the Null hypothesis: The size of the population is directly proportional to the size of its underground economy, against, Alternative hypothesis: The size of the country's population is not directly proportional to the size of the underground economy.

### *Data*

The data collection method used was stratified sampling, where the stratum was the OECD countries. The secondary data sources included government reports, tax records, academic research, and international databases. The data were analyzed using SPSS software and EXCEL.

### *Model*

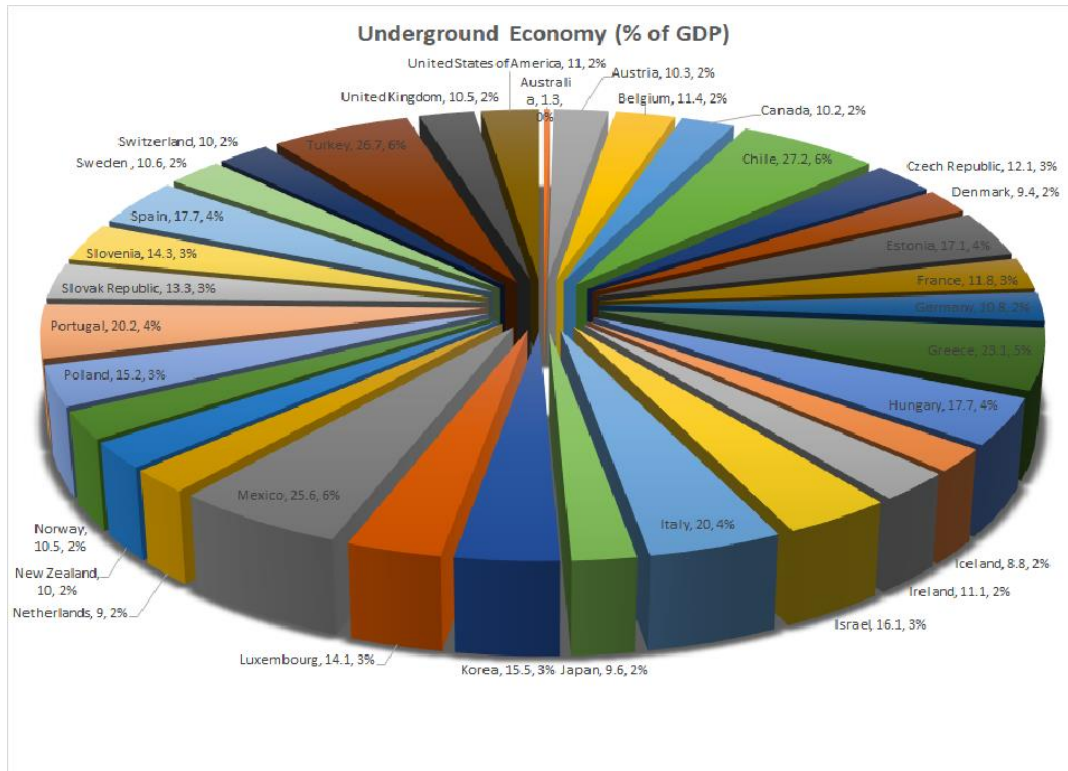
The model used to check the relationship between the size of the underground economy and the population was a simple linear regression model;

$$Y = \beta_0 + \beta_1 X + \epsilon$$

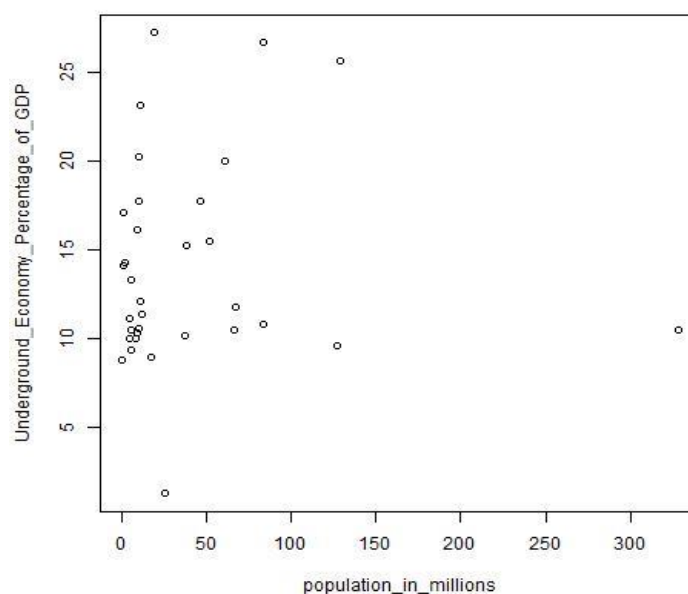
$$\text{Underground economy} = \beta_0 + \beta_1 \text{population}$$

### *Findings*

A breakdown of each OECD economy as a share of GDP. Source: The OECD's "Statistics Brief on the Underground Economy".



Analyzing the data represented by the pie chart reveals that there are vast discrepancies in the size of underground economies across different countries. Australia, Denmark, Iceland, Japan, and the Netherlands have underground economies constituting less than 10% of their GDP. Conversely, Chile, Greece, Italy, Portugal, Mexico, and Turkey have significantly larger shadow economies that exceed 20% of their respective GDPs (Spiro, 2018.)



The scatter plot above demonstrates a strong, positive, linear relationship between population (in millions) and underground economy (as a percentage of GDP). There appear to be outliers in the data.

*The simple Linear Regression model*

$$Y = \beta_0 + \beta_1 X$$

$$\text{Underground economy} = \beta_0 + \beta_1 \text{population}$$

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		95.0% Confidence Interval for B		Collinearity Statistics		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	13.817	1.211		11.405	.000	11.346	16.288		
	Population (in million)	.004	.017	.048	.267	.792	-.029	.038	1.000	1.000

$$\text{Underground economy} = 13.817 + 0.004 \text{population}$$

The table above depicts the relationship between a country's population (millions) and its underground economy (percentage of GDP). The unstandardized and standardized coefficients of the model used to predict the underground economy are shown in the first column (Model). The unstandardized coefficient (B) is the amount by which the underground economy grows for every unit increase in population. The standardized coefficient (Beta) is the amount by which the underground economy grows for every one standard deviation rise in population. The t column displays the t-test value used to determine the significance of the coefficient and the Sig. The column displays the likelihood of receiving the observed value of the coefficient by chance. The 95.0% Confidence Interval for the B column shows the values within which the underground economy will likely fall when the population increases by one unit. Finally, the Collinearity Statistics columns display the model's tolerance and variance inflation factor (VIF), reflecting the multicollinearity degree.

*Analysis of Variance (ANOVA)*

ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.446	1	2.446	.071	.792 <sup>b</sup>
	Residual	1066.721	31	34.410		
	Total	1069.167	32			

a. Dependent Variable: Underground Economy(% of GDP)

b. Predictors: (Constant), population (in a million)

The critical f-value at a 95% level of significance is 4.14910.

The table value 0.071 is less than 4.14910. Therefore, we fail to reject the null hypothesis and conclude that there is enough evidence at a 95% confidence interval to suggest that the size of a country's population is directly proportional to the size of its underground economy.

### **Conclusion**

This article comprehensively examines the underground economy, shedding light on its components, size, causes, and effects. Accurate data analysis from various sources provided valuable insights into this complex phenomenon.

The study found a positive, linear relationship between the population and the underground economy. As a country's population increases, so does the size of its underground economy. There are several reasons for this relationship. First, more significant people have more potential participants in the underground economy. Second, more prominent populations are more likely to have weak institutions and regulations, making it easier for people to participate in the underground economy. Third, more prominent folks are more likely to have high levels of inequality, which can incentivize people to participate in the underground economy to supplement their income.

The findings, on the other hand, have several implications for policymakers. First, they suggest that policymakers should focus on reducing the size of the underground economy to boost economic growth and tax revenue. Second, they suggest that policymakers should strengthen institutions and regulations to make it more difficult for people to participate in the underground economy. Third, they suggest that policymakers should focus on reducing inequality to reduce the incentive for people to participate in the underground economy.

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