T.C.
ANKARA YILDIRIM BEYAZIT UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES

THE EFFECTS OF SHADOW ECONOMY ON ECONOMIC GROWTH IN AZERBAIJAN

MASTER'S THESIS

NEMAN HASANZADE

DEPARTMENT OF ECONOMICS

ANKARA 2020

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APPROVAL PAGE

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PLAGIARISM

I hereby declare that all information in this thesis has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work; otherwise, I accept all legal responsibility. (24/05/2020)

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ÖZET

Azerbaycan'da Gölge Ekonomisinin Ekonomik Büyüme Üzerine Etkileri

Gölge ekonomisi ülkelerin uğraşması gereken karmaşık bir konudur. Her ne kadar gölge ekonomisinin toplum ve ekonomi üzerinde bazı olumsuz etkileri olduğuna inanılsa da, bazı olumlu etkiler de olabilir. Bu çalışma, gölge ekonomisinin Azerbaycan'ın ekonomik büyümesine etkilerini analiz etmeyi amaçlamaktadır. Çalışmada gölge ekonomisinin Azerbaycan ekonomisi üzerindeki etkisi 1991 ve 2017 dönemi için ölçülmüştür. Azerbaycan'da gölge ekonomisi ile ekonomik büyüme arasındaki ilişkiyi analiz etmek için VAR modeli kullanılmış ve değişkenler arasında karşılıklı nedensellikleri kanıtlamak amacıyla VAR Granger Nedensellik Testi uygulanmıştır. Gölge ekonomisi ile ekonomik büyüme arasında istatistiki olarak anlamlı bir ilişki olmaması, VAR Granger Nedensellik testi ile gölge ekonomisi ve ekonomik büyümenin birbirini tahmin edemeyeceği görülmüştür.

Anahtar kelimeler: Gölge ekonomisi, Ekonomik büyüme, VAR modeli, VAR Granger Nedensellik, Azerbaycan

ABSTRACT

The Effects of Shadow Economy on Economic Growth in Azerbaijan

Shadow economy is a complex economic issue that countries have to deal with. Although the shadow economy is believed to have certain negative impacts on the economy, there might be some positive effects. This study aims to analyze the effects of the shadow economy on Azerbaijan's economic growth. The study analyzes the effects of the shadow economy in the period 1991–2017 in Azerbaijan. In order to analyze the relationship between the shadow economy and economic growth in Azerbaijan, VAR and VAR Granger Causality analyses have been utilized. Although the study finds no significant connection between shadow economy and economic growth, the VAR Granger Causality test indicates that the shadow economy and economic growth cannot forecast each other and there is not any type of relationship.

Keywords: Shadow economy, Economic growth, VAR model, VAR Granger Causality, Azerbaijan.

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Abbreviations

ACCA : Association of Chartered Certified Accountants
ADF : Augmented Dickey Fuller
AIC : Akaike Information Criteria
ARDL : Autoregressive Distributed Lag
AZN : Azerbaijan Manat
BoP : Balance of Payments
EcGr : Economic Growth
FDI : Foreign Direct Investment
FPE : Final Prediction Error
GDP : Gross Domestic Product
HQ : Hannan Quinn Information Criteria
IMF : Intenational Monetary Fund
NAR : Nakhcivan Autonomous Republic
OECD : The Organization for Economic Cooperation and Development
SE : Shadow Economy
SIC : Schwarz Information Criteria
SSC : The State Statistical Committee of the Republic of Azerbaijan
USA : United States of America
USAID : United States Agency for International Development
VAR : Vector Autoregression
VAT : Value-Added Tax
WTO : World Trade Organization

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1. INTRODUCTION

Economic growth is one of the most critical economic objective in both developed and developing countries. The ultimate aim of economic policies is to guarantee economic growth and strengthen the economy. As a developing country, Azerbaijan has undergone massive troubles to sustain stable economic growth since 1991. Although Azerbaijan is rich in natural resources, such as crude oil and natural gas, the economic development has been weaker than expected.

The relationship between the shadow economy and economic growth has attained great deal of interest in economic literature. Some researchers have argued that the shadow economy negatively affected economic growth. However, some others pointed out that it might contribute to economic growth. So, it is essential to measure the effect of the shadow economy on the economic growth in Azerbaijan, because there are considerably few studies dedicated to this phenomenon.. Having considered the significant difference between the statistical data of the government and other world organizations related to the size of the shadow economy, there are a limited number of studies in this field.

1.1 Background of the Study

The term shadow economy and economic growth have been popular in Azerbaijan since Azerbaijan gained its independence. The approach of government and society towards the shadow economy has changed since different studies were dedicated to the shadow economy and its effects on macroeconomic indicators, such as economic growth.

In the literature, there are various alternatives for the shadow economy, such as the hidden economy, secondary economy, informal economy, black economy, etc. As the shadow economy might be considered to be a matter of economics, law, sociology, and other social study branches, the definition of shadow economy varies from field to field. From the legal aspect, the shadow economy is analyzed in legal framework, while public finance mainly focuses on tax avoidance. In terms of economic aspects, the effect of the shadow economy on macroeconomic indicators and economic growth are the main points.

Another issue linked with the shadow economy is that the definition of the shadow economy varies from country to country. For example, the definition of the shadow

economy in post-Soviet countries is different from other countries. It is so severe for transition economies to change the economic system and apply a stable tax system.

Moreover, illegal activities such as bribery and trade of drugs and guns may not be considered to be a part of the shadow economy.They are considered to be money transfers thatdo not create value in an economy. Nevertheless, money from illegal activities may quickly enter the economy through money laundering. Therefore, there should be considerable differences among the results of different calculation methods of GroDP.

Another level of the shadow economy arises from the practice of bartering. As individuals barter or produce for their own consumption, it leads to under-estimation of Gross Domestic Product. Additionally, individuals who are not registered in any company but work at home, such as computer programming, cooking, or homeschooling, are part of the unregistered economy.

In the literature, there are two main approaches to the shadow economy. While some scholars point out the positive effects of the shadow economy, others disagree. Most of the scholars advocate that shadow economy negatively affects economic and social structure in both developed and developing countries. Conversely, another approach points out that the shadow economy plays a crucial role in economic growth, especially in the least developed countries.

Scholars such as Tanzi (1999), Guttmann (1999), Feige (1989) state that shadow economy leads to moral deterioration in the economy, which in turn affects the economic and social structure. The idea behind these thoughts is a theory of marginalism. This theory implies that there are differences among the regions of the country and as well as in the community. Unlike other parts or communities of the country, the modern part is more educated and consists of higher-income population who have access to education, transport, health, and other necessary amenities. According to Johnston (1998), the developed part of the society enjoys considerable advantages over other parts in terms of access to resources. The gap between these two parts leads to inequality, and in order to decrease this inequality, governments give the green light to unregistered activities for increasing their income. Johnston (1998) also points out that the main reason for bribery is an unequal distribution of resources among the segments and members of society.

According to Mitra (2016), urbanization is one of the roots of the shadow economy in developing countries. He stated that most of the people want to work in big cities; however, they are not qualified. As a result, they tend to work in the unregistered economy. Especially considering the low proportion of industry in a developing country, high supply and low demand for labor leads to shadow economy.

Feige (1989) stated that the shadow economy would lead to the wrong prognosis of GDP in the future. That means, the higher the shadow economy, the higher the chance of unsuccessful economic policies.

Conversely, scholars from the Latin American school defend the positive effects of the shadow economy. In their studies, it was indicated that the shadow economy supported economic growth, efficient market economy, and income equality. The main idea behind these thoughts is that the people who move to big cities are more likely to work in unqualified works in the unregistered economy, but as time elapses, they develop their skills and move to the registered economy. As a result, the share of the shadow economy decreases.

According to De Soto (1989), bureaucratic problems and higher taxes give incentives to companies and individuals to work in the shadow economy. As time passes, the shadow economy helps companies to work efficiently and support equal distribution of income. As a result, they move to the registered economy with the help of sufficient economic policies.

As a developing country, Azerbaijan has been facing the problem of shadow economy since its independence. In the literature, there are few studies dedicated to shadow economy in Azerbaijan. According to the Association of Chartered Certified Accountants (ACCA), the size of the shadow economy was estimated at 66.12% of GDP in 2017. However, the shadow economy is estimated at 23% of the global economy and is expected to fall to 21% by 2025.

Conversely, according to ACCA, it is expected that the shadow economy would remain a significant part of GDP (58%) in Azerbaijan by 2025. The consultancy cited corruption, a non-democratic governance system, and direct economic growth prospects as the main reasons behind the vast size of the shadow economy in Azerbaijan. According to International Monetary Fund data, the size of the shadow economy was estimated at 40.22 billion Azerbaijan Manat compared to GDP, which was 67 billion AZN in 2016. Also,

Medina et al. (2017) estimated the size of the shadow economy at an average of 58% in the period of 1999–2007. However, the State Statistical Committee of the Republic of Azerbaijan announced the figure at only 9.1% of GDP in 2015.

According to Bagirzadeh (2007), the main reason for the persistence of the shadow economy in Azerbaijan is corruption. Laws and institutions are not strong enough to struggle against corruption. Mainly, problems in tax administrations have a particular contribution to the shadow economy. Insufficient tax polices force companies to avoid taxes through legal and illegal ways. From this point, the principal reasons for the shadow economy should be analyzed, and new tax policies should be developed, which give incentives to companies for shifting to a registered economy. According to Bayramov (2012), dominating the oil sector is one of the main reasons behind the shadow economy. Also, a low level of economic liberalization and bureaucratic problems are critical contributors to the shadow economy. Furthermore, a high level of cash payments helps the shadow economy to grow.

1.2 Problem Statement

After the collapse of the Soviet Union, the Republic of Azerbaijan gained its independence. Since 1991 the government has begun to apply the principles of the market economy. However, in order to make a smooth transition, Azerbaijan did not have sufficient economic, political, and social institutions because of significant differences between the command and market economies. These differences led to various challenges to Azerbaijan as one of the post-soviet countries. As a result, the size of the shadow economy increased year by year. Weak economic institutions, insufficient regulation, and experience of command economy ushered in the shadow economy and posed challenges to economic and social growth.

Several factors determine the economic growth of Azerbaijan. After Azerbaijan got its independence, the transition from the command economy to the market economy was arduous and inconvenient. The lack of sufficient economic institutions made Azerbaijan suffer from regulating the economy. Moreover, cooperation with other post-Soviet countries was disrupted; that is why domestic production had decreased significantly all over the Post-Soviet countries, which resulted in a dramatic decrease in economic growth. Simultaneously, an outbreak of war with Armenia caused the country to devote all the

economic resources to the war and elimination of its repercussions after 1994. As a result, macroeconomic indicators such as GDP growth, unemployment, and inflation deteriorated during this period. Conversely, after getting the oil revenues from oil contracts, Azerbaijan's economy had prospered and gained benefits from the oil boom since 2005. Nevertheless, again after the 2014 oil shock, the macroeconomic indicators have significantly plunged. In the period between 1991 and 2017, all other economic factors fluctuated and affected the economy. Although the shadow economy is not considered to be one of the primary determinants of economic growth in Azerbaijan, there is still a need for clarification and determination of the effects of the shadow economy.

There are several factors that affect the size of the shadow economy in Azerbaijan. One of them is obviously a significant difference between Baku and other regions. Historically, Baku has been the most industrialized city of Azerbaijan because of the oil sector. As the oil sector developed, other sectors gained benefits from it. During the Soviet Union, as a result of the command economy, the percentage of people who lived in Baku was less than today. However, after independence, the economic crisis in all sectors made people move to the capital city. Also, the Nagorno-Karabakh problem accelerated urbanization in Baku. The increasing amount of unskilled labour supply led to the work in the unregistered economy with low wages.

One of the most important backers of the shadow economy is ineffective tax policy. While most of the social contributions are made by the employer, employers are not willing to make registered contracts with employees thanks to a higher supply of labour. Having considered that, employers are liable to pay 22% of the gross salary of the employee, while 3% is deducted from the gross salary of the employee, it is understandable why companies are reluctant to make registered labour contracts. It makes net salaries more expensive in terms of tax payments, but "protects" employees from the tax burden. In fact, these policies damage the economic and social structure and change the behaviour of individuals.

In this study, the reasons for the abovementioned factors and its consequences will be examined deeply, and policy amendments related to this issue will be proposed. The main drivers of the shadow economy will be identified, and the effects of possible useful policies will be analyzed. Most importantly, the harmful effects of reducing the shadow economy, such as increasing unemployment, etc. will be analyzed. This study will be

helpful to scrutinize the effects of the oil boom and insufficient economic institutions on the shadow economy.

1.3 Objective and Research Question of the Study

1.3.1 The Objective of the Study

This study aims to analyze the effects of the shadow economy on the economic growth of Azerbaijan and to find out the main determinants, as well as the causes and consequences of the shadow economy. This objective will contribute to the crystallization of the impacts of the shadow economy and enable us to determine whether it has mere positive or negative effects. The period of 1991–2017 will be analyzed through an econometric model, and policy recommendations will be given in accordance with the results. Moreover, the factors, which support the size of the shadow economy will be determined, and economic policies will be construed.

1.3.2 Research Question of the Study

Although there has been a broad analysis of the effects of the determinants, such as the natural resources, war, military expenditures, barriers for investment, human capital and FDI on economic growth in Azerbaijan, this study mostly focuses on the following questions:

1. What is the impact of the shadow economy on the economic growth in Azerbaijan?

2. What are the main drivers of the shadow economy and its consequences in Azerbaijan?

1.4 Significance of the Study

Although a considerable amount of studies have been carried out on the shadow economy and economic growth, there are still huge gaps with regard to the relationship between the shadow economy and economic growth in Azerbaijan. In the literature, there are few studies, which have been dedicated to the measurement of the shadow economy, its

size, causes, and consequences; however, there is not any study, which examines the relationship between these two phenomena. As it has already been illustrated, the impact of the shadow economy on economic growth might be positive, negative, and insignificant, so in terms of Azerbaijan, it is not apparent that, whether the effect of the shadow economy is positive or negative. The most crucial significance of this study is that the connection between these two economic indicators will be measured, and it will be clarified how the shadow economy affects economic growth.

Having clarified the hidden effect of the shadow economy on economic growth, primary drivers of shadow economy will be studied, and relative policy recommendations will be given whether to follow a policy, which has been adopted to decrease the level of shadow economy or not to intervene. Considering that, a decline in the shadow economy lead to collecting more tax and other revenues and these resources can be managed by the government for economic growth, this study will show whether it is efficient or not.

1.5 Hypothesis

The main hypothesis of this study is that the shadow economy and economic growth may have an impact on each other. In the literature, it is believed that a higher level of shadow economy leads to decreasing tax revenue and affects fiscal stability. Having considered the macroeconomic effects of decreasing tax revenues, it is believed to hinder economic growth. It means that the shadow economy has a negative impact on economic growth. According to Ikiz (2017), stable economic growth may decrease the shadow economy. Moreover, Latin American scholars, such as Loayza (1996) argue that the shadow economy may have a negative effect on economic growth. In addition, economic growth has an impact on the shadow economy. While economic growth is unstable, the individuals hesitate to promote the formal economy. In this context, the specific hypothesis of this study might be stated in the following way: Increasing the size of the shadow economy will lead to a decrease in economic growth.

1.6 Study Plan

This study consists of six chapters that start with an introduction and end with a conclusion. As the first chapter, “Introduction” consists of “Background of the study,” which contains information about previous researches related to these study, “Problem

statement" in which problem is stated briefly, "Objective and research question of the study" in which the main points of this study are provided, "Significance of the study," which illustrates the importance of research, "Hypothesis," which presents the expectation about the result of this study and finally "Study plan," which shows how the thesis is organized. In the second chapter, a brief review of Azerbaijan's economy is conducted. In this chapter, the structure of Azerbaijan's economy is examined, and the factors which determine economic growth are illustrated. Moreover, the size of the shadow economy is weighed, and the main drivers of the shadow economy are analyzed as the cause of the shadow economy and its consequences. With the help of graphs and tables, fluctuations in the size of the shadow economy and the level of economic growth in the period of 1991–2017 are explained systematically. In the third chapter, the terms shadow economy and economic growth are discussed based on the views of other researchers and the school of thoughts, and their hypotheses are presented. The fourth chapter is dedicated to the literature review in which existing literature regarding the relationship between the shadow economy and economic growth is analyzed, the main drivers of economic growth and determinants of the shadow economy are introduced. The fifth chapter is entitled as data and methodology, which delineates the research methodology step by step. Moreover, this chapter provides information on how and from which source the data were collected, for how many years the data exist, and how many of them are used. Furthermore, the methodology is explained and the econometric tests and methods such as log transformation, dealing with negative numbers, Augmented Dickey-Fuller unit root tests, the lag selection by considering different criteria, the Vector Autoregression (VAR) model, VAR Granger causality, the impulse response and then the VAR model for Azerbaijan are defined. In the sixth chapter, the empirical results, which consist of the results of applied econometric tests and methods, and the effects of variables are clarified. Finally, in the seventh chapter, the results of this study are concluded, and policy recommendations are made for handling the problem.

2. BRIEF REVIEW OF THE AZERBAIJAN'S ECONOMY: STRUCTURE OF ECONOMY, ECONOMIC GROWTH, AND SHADOW ECONOMY.

In this chapter, the formation of the economy in Azerbaijan, as well as economic growth and the shadow economy will be examined. GDP will be explained through including and excluding the oil sector. Moreover, primary factors of economic growth in Azerbaijan will be studied, and barriers to economic growth will be discussed. Furthermore, the causes and consequences of the shadow economy in Azerbaijan will be presented.

2.1 Overview Azerbaijan's economy after independence

The economy of Azerbaijan reached a more satisfying level of economic growth during the Soviet period, but was not efficiently structured. For example, between 1960 and 1970, the average growth rate was 5.2%, which increased to 7.4% between 1970 and 1980. However, in the last ten years before independence, the rate of economic growth significantly declined to 5%, which was prevalent in the Soviet Union and led to its collapse. Notably, a higher rate of using natural resources in economic sectors, such as energy and oil sectors, resulted in the economic crisis. During these years, the economy of the Soviet Socialist Republics lagged far behind not only developed countries but also developing countries. According to Amiraslanov (2001), Azerbaijan's economy has inherited the following problems from the Soviet Union:

1. Poor economic structure.

2. Unequal regional and sectorial share of production.

3. Low level of quality of production.

4. Dependent economy on import.

5. Low level of total economic output, which comprises 50% of total consumption.

6. The disadvantage over foreign trade with other Soviet republics.

7. Mostly exporting raw and intermediate goods, such as crude oil and its intermediates, but importing final goods.

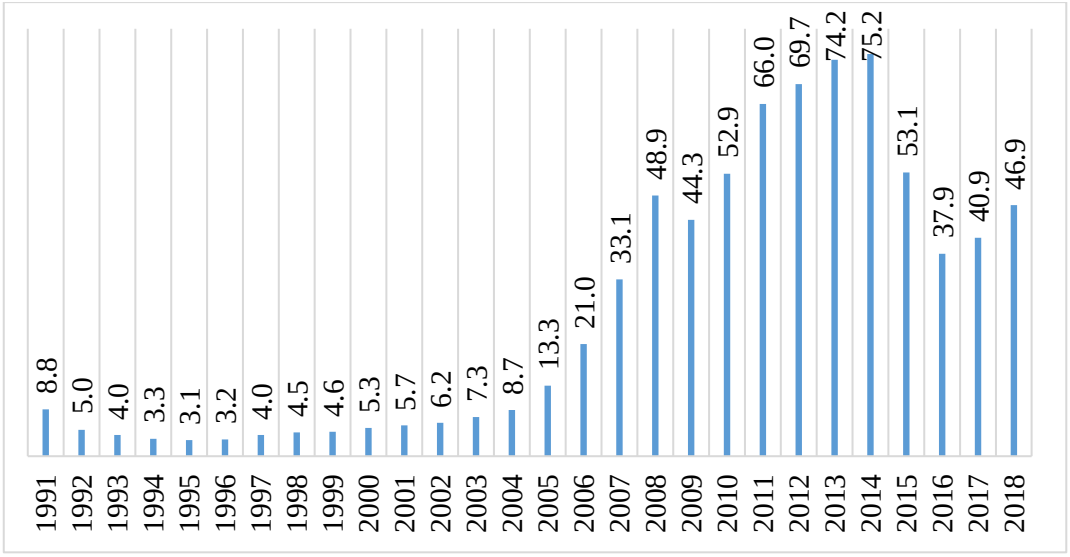
8. Poor differentiation of foreign trade, mostly with Russia, which comprises 50-60% of overall foreign trade.

Before the collapse of the Soviet Union, the overall situation in Azerbaijan's economy was quite terrible. After independence, Azerbaijan lost its export and import markets, which resulted in losing its supply chain of raw and intermediate goods for production. Loss of economic cooperation with other soviet republics led to the stagnation or low level of production in Azerbaijan. Moreover, Azerbaijan could not export its natural resources, such as crude oil and natural gas, because all of them used to be exported to Russia and delivered from one center. The outbreak of the war with Armenia right after independence exacerbated the situation. All the resources were squandered on its repercussions, which could have been spent on economic development and building sufficient institutions. The government did not take drastic measures against the emerging problems of that period. That is why the economy suffered a lot. The transition to the market economy, the lack of political stability, and the outbreak of war resulted in the economic crisis between 1992 and 1994. The higher level of unemployment and hyperinflation was observed during these years. In 1991, the government started to apply the VAT and established the Ministry of Taxes with the purpose of collecting revenues for the budget. In order to bridge the budget deficit, the government followed the worst policy, which was just printing the money. As a result, inflation rose to a level of a 4-digit number. Fortunately, in 1994, the Ceasefire contract was signed with Armenia and after the oil contracts were signed with 13 countries, which involved the redesigning of oil production, organizing oil transport, and sharing oil revenues in Azerbaijan. After signing "Contract of the Century," the new period started in Azerbaijan's economy.

2.2. The Structure of GDP in Azerbaijan

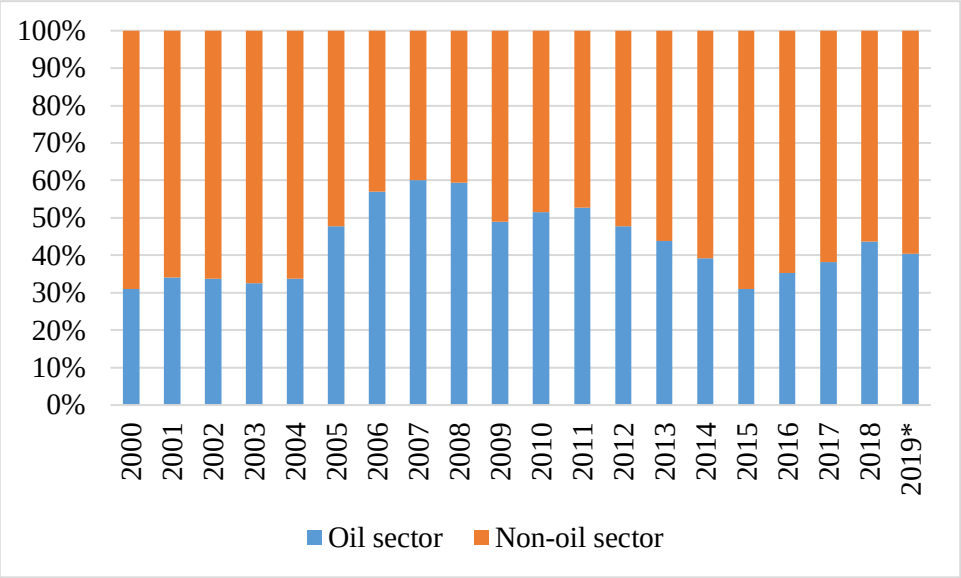
In 1991, when Azerbaijan regained its independence, GDP comprised 8.8 billion dollars. Until that time, GDP was inclined to decrease significantly because of war and difficulties related to a free-market economy, weak economic institutions, and poor

regulation of the economy and wrong economic policies. Actually, from 1991 the government began to build economic institutions in order to survive in a free-market economy. This process entailed changes in legislation, establishment, and renewal of government institutions and the application of the principles of the market economy. From 1991 to 1996, GDP declined approximately 2.5 times. However, this trend stopped in 1997, when GDP started to grow again and reach 4 billion dollars, which was approximately 2 times less than in 1991. It was achieved as a result of the ceasefire with Armenia, "Contract of the Century," and institutional changes, which accelerated macroeconomic stability. From 1991 to 2008, this trend continued, and as a result, GDP reached 48.9 billion dollars. From 2004 until 2008, GDP started to grow at an increasing rate. That growth was maintained with the revenues coming from the oil boom. In 2008, GDP was affected by the financial crisis and decreased. From 2009 to 2014, a positive trend was observed again, and GDP reached its pinnacle – 75.2 billion dollars over the period. During this period, the average price of crude oil was at its peak, approximately between 100 and 145 dollars. Until 2016, there was a negative trend in GDP, and GDP decreased to 37 billion dollars, which was 2 times less than in 2014. During this period dollar was getting stronger over other currencies, but the exchange rate was stable in Azerbaijan, which resulted in melting currency reserves and made devaluation inevitable. The exchange rate increased from 0.78 to 1.05 and 1.95, respectively, then was stabilized at 1.7.



Source: https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=AZ

Figure 2.1. Azerbaijan's GDP at Current US Dollar



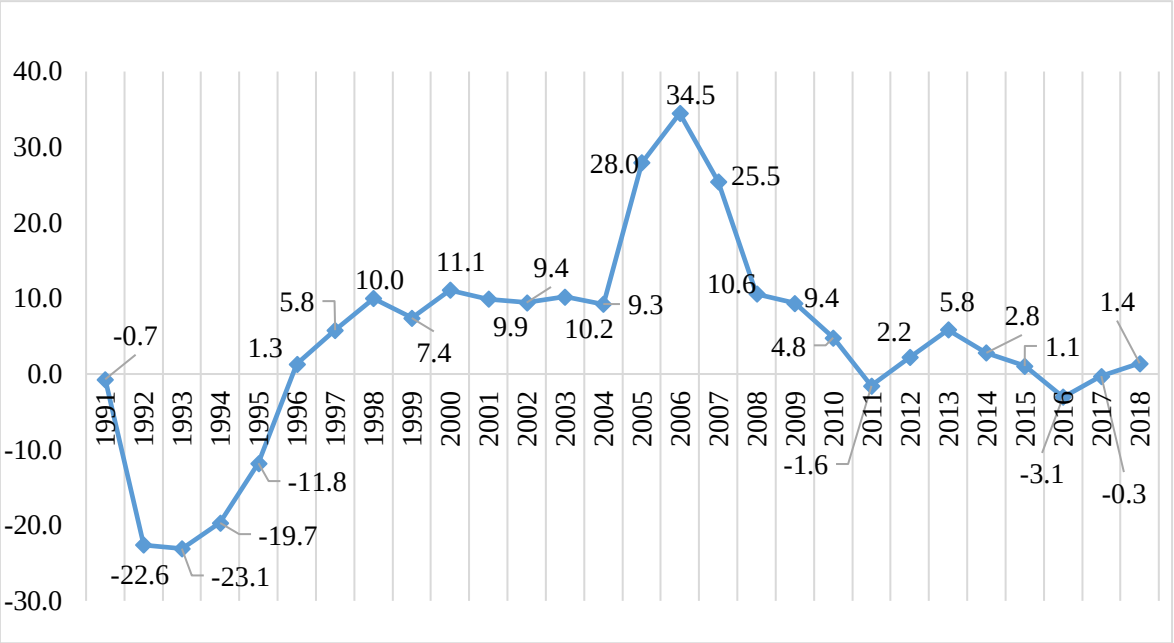
Source: https://www.stat.gov.az/source/system_nat_accounts/

Figure 2.2. The share of oil and non-oil sectors in Azerbaijan's GDP.

In order to understand the fluctuations in economic growth, it is essential to examine the GDP as an oil and non-oil sectors. In figure 2.2, the structure of GDP is described in terms of oil and non-oil sectors. It is clear from the graph that the oil sector accounts for a significant part of GDP, and in specific years, it approximately comprised up to 60% of GDP. Having considered a significant proportion of the oil sector in GDP, it is clear that fluctuations in the crude oil price should affect the GDP significantly. Furthermore, a significant part of the exported goods in value is crude oil and oil sector goods, which makes sense. However, the indirect effect of the oil sector on GDP is much more complicated than described above. Because some parts of non-oil sectors are connected to oil sectors, which means the oil sector makes the additional value in non-oil sectors.

2.3 Economic Growth

In figure 2.3, the economic growth rate of Azerbaijan during the period of 1991–2018 has been illustrated. Apparently, as a fledgling independent country and due to the war, Azerbaijan's economy suffered from a dramatic negative growth rate. In 1994, the growth rate declined to -22.6. However, from 1996 the economy started to grow at a positive rate, and in the period of 1998–2004, the level of growth was stabilized at approximately 9.5%. In 2006, because of the oil boom, the growth rate peaked at 34.5%, which was the best result among the world countries.



Source: https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=AZ

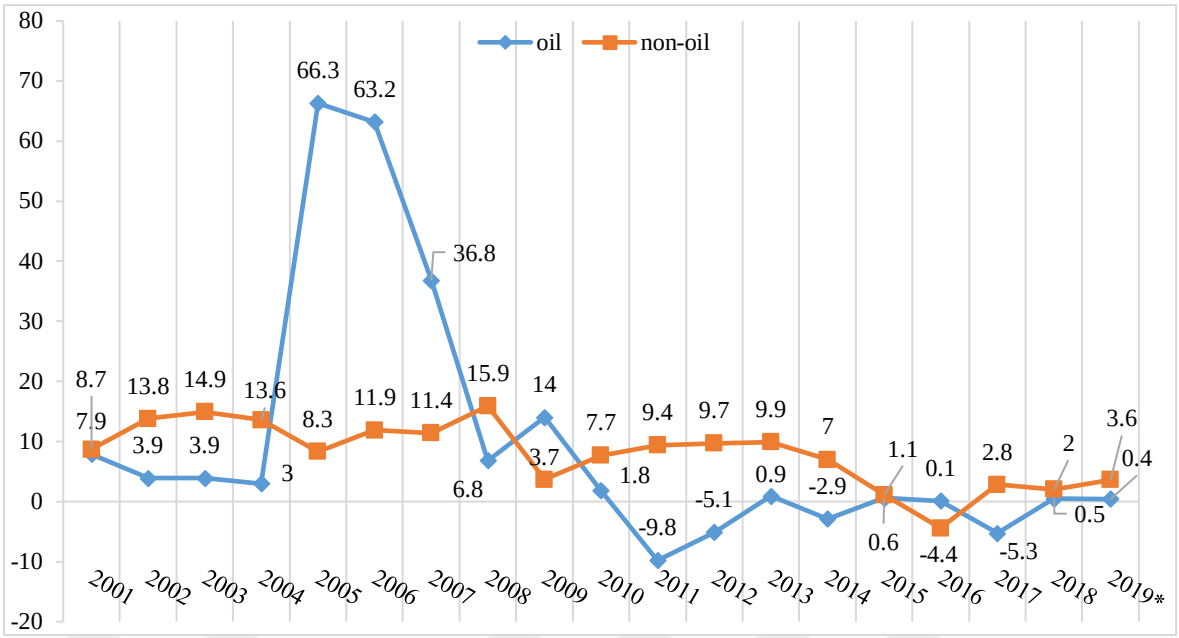
Figure 2.3. Economic growth rate in Azerbaijan (%)

The 2008 financial crisis affected economic growth, and after that, dropped oil prices led to a lower rate of growth.

2.3.1 Key Drivers of Economic Growth

Oil and Gas Sector

The most important part of real economic growth emanates from the significant increase in the oil sector. Figure 2.4 illustrates the difference between the growth of the oil and non-oil sectors. The oil boom in 2005 is apparent from the graph. There are two primary factors that determine the oil sector growth: the price of crude oil and the volume of the production. According to the statistics of the Oil Fund of Azerbaijan, the volume of the production is expected to drop year by year. That will result in decreased oil revenues and affect GDP growth, respectively. In the long term, there is no expectation for a higher price of crude oil, which means the government should redesign the oil industry and produce final goods instead of exporting crude oil. Because of the higher value addition in producing final goods, the negative effects of decreasing the volume of production and fluctuations in the price of crude oil on economic growth might be prevented.

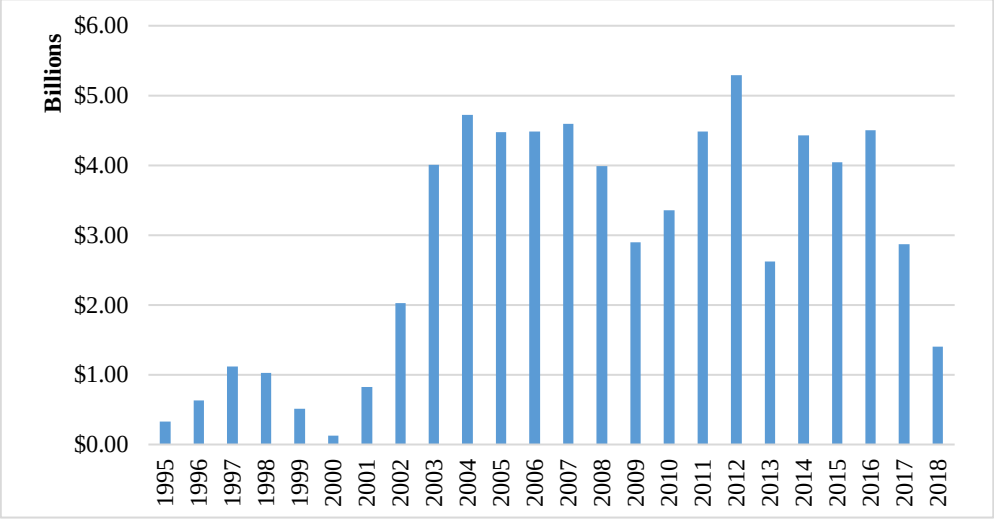


Source: https://www.stat.gov.az/source/system_nat_accounts/

Figure 2.4. Oil and Non-oil growth of GDP (%)

Foreign Direct Investment (FDI)

Over the period, FDI fluctuated between 0.4 and 5.3 billion dollars. Because of the crisis in the economy, there is no stable path in FDI. FDI reached its peak at 5.3 billion dollars in 2012, while the average crude oil price was approximately 110 dollars per barrel.



Source: https://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD?locations=AZ

Figure 2.5. Foreign direct investment, net inflows (BoP, current US$)

After the significant drop in 2013, FDI climbed over 4 billion dollars again, which could be attributed to the devaluation. Furthermore, the negative trend in FDI continued until 2018, which was related to different events, such as decreasing global demand for crude oil, robust expectation of lower oil prices in the future. There is no available information after 2018, but FDI is expected not to go below 1 billion. Although there is a global trade war, there is still an expectation of higher inflows of FDI. In recent years, the government has been following the policy, which makes Azerbaijan attractive in terms of FDI. These measures encompass institutional changes, attempts to eliminate barriers to businesses and start-ups, creation of industrial and free trade zones, which are exempted from tax or have tax deductions. Moreover, Azerbaijan is located on the transit routes between Europe and Asia, which may bring dividends.

2.3.2 Restraint to Economic Growth

Dependence on import and structure of export

As a developing country, Azerbaijan is not capable of self-sufficiency. In order to compensate for the total consumption of the population in the country, it is obligatory to import from foreign countries. According to the SSC, the level of self-sufficiency for daily products is low; that is why dependence on imports is quite reasonable. Dependence on imports is ascribed to not having high technology and low-level quality of production.

In terms of industrial production, the situation is the same. For all industrial sectors, there is a need for raw, intermediate goods. This dependence made production vulnerable as the prices of these production factors increased. Moreover, in the industry sector, there was a lack of technology products, which led to a reliance on imports. To conclude, the price of local production is quite high; that is why a deficiency in production may not be eradicated. However, in order to support local production, the government has recently exempted raw materials from custom duties on import and decreased it for intermediaries. This may give incentives to businesses to establish local production in the country. Moreover, decreasing the dependence on imports was the long-term strategy of the government, and because of this policy, the government analyzed and defined specific sectors, which were dependent on import, but it is possible to meet the deficiency in these sectors. That is why the government tried to give incentives to these sectors, and as a result

of that policy, it was expected to decrease dependence on imports. In 2018, imports and exports were 11.46 and 19.45 billion dollars, respectively.

According to the SSC, top import and export products in 2018 have been described in Table 2.1.

Table 2.1. Top imported goods % of total import in dollars

Machines and mechanisms	22.6%
Non-precious metals and products made from them	12.3%
Chemical industry production	8.5%
Precious metals and its products	7.3%
Transport vehicles	7.1%
Raw minerals	6.7%
Final food products, alcoholic and non-alcoholic beverages, vinegar, tobacco	6.3%
Others	29.2%

Source: https://www.stat.gov.az/source/trade/

In addition, the commodity structure of export is low diversified. Figure 2.7 shows the top exported goods in 2018. It is clear from the graph that the exports of Azerbaijan consist of raw mineral materials, and most of these goods are crude oil, oil products, and natural gas.

Table 2.2. Top exported goods % of total export in dollars

Mineral products	92.1%
Others	7.9%

Source: https://www.stat.gov.az/source/trade/

That is why the government should diversify the export in terms of commodity structure in order to get stable revenue. Considering the raw materials, market prices

fluctuate over the period, and therefore, it is essential to produce and export intermediate and final goods to benefit from value addition.

Barriers to Businesses

After the independence transition to the free market economy was painful for Azerbaijan and other post-soviet republics. In order to successfully complete this transition, there was a desperate need for changes in legislation, institutions, and governance. A considerable amount of public sector has been privatized since the end of the 2000s. Nevertheless, the newly established oil industry remained at the control of the government. In 1999, the Oil Fund was established in order to manage the oil revenues and save funds coming from petrol sales for future generations. Moreover, some part of the oil revenues were transferred from the Oil Fund to State Budget in order to cover budget deficit while government spending was rising year by year. With the help of transferred money from the Oil Fund, the government managed to build infrastructure through big projects. Mostly this fund was invested in infrastructure projects such as Baku-Tbilisi-Kars railroad, Baku-Tbilisi-Ceyhan pipeline, restructure of old petrol processing factories, building roads, railroads and increasing the level of electricity and gas. However, in the 2000s, structural changes in legislation and regulation did not accompany these infrastructure projects. During this period, there were no significant institutional changes in Azerbaijan. Benefits from the oil boom created a big bubble in Azerbaijan's economy, and all macroeconomic indicators were going to be better until the burst of the bubble. In 2014, decreasing oil price and deficit in Balance of Payments made local currency devaluate. To conclude, during this period, the government did not work seriously on building a better environment for business; however, after the devaluation shock, the government started to care about defining the better policy in order to create incentives for businesses.

In Table 2.3, there is a comparison of Azerbaijan, Georgia, and Armenia in terms of different indicators in 2018. In terms of economic growth in 2018, Armenia came first with 5.2% and followed by Georgia and Azerbaijan 4.8% and 1.4%, respectively. In terms of the rule of law and control of corruption and corruption perceptions, Georgia was the leader of the region. On the other hand, the corporate tax rate was the least in Georgia, with 15%, while it is 20% in Azerbaijan. Moreover, the number of taxes paid by the business was also the least in Georgia, which made Georgia attractive to business. Besides, the

overall tax rate was the lowest in Georgia in comparison with Azerbaijan and Armenia. Furthermore, Interest rates on bank credit to the private sector also was the lowest indicator in the region. Concluding all these indicators, Georgia was deemed attractive to businesses and investments.

Table 2.3.Comparison of South Caucasus Region countries

Indicators	Azerbaijan	Georgia	Armenia
Economic growth	1.41	4.8	5.2
Rule of law index (-2.5 weak; 2.5 strong)	-0.6	0.33	-0.15
Control of corruption (-2.5 weak; 2.5 strong)	-0.83	0.71	-0.35
Regulatory quality index (-2.5 weak; 2.5 strong)	-0.38	1.12	0.27
Corruption Perceptions Index, 100 = no corruption	25	58	35
Corporate tax rate	20	15	20
Tax rate, percent of commercial profits	41.2	9.9	18.5
Number of taxes paid by businesses	7	5	15
Interest rates on bank credit to the private sector	17.45	11.12	12.79

Source: Theglobaleconomy.com

However, in recent years, the government has started to make institutional changes; as a result, Azerbaijan's place in global reports climbed significantly. According to the Global Competitiveness report in 2019, Azerbaijan's position changed from the 69th to the 58th, thanks to institutional and other changes. In 2019, Georgia and Armenia were placed on the 74th and 69^{th,} respectively.

Another factor that affects the business climate in Azerbaijan is not to become a member of the World Trade Organization. Azerbaijan's foreign trade policy mostly focuses on protectionism, which implies higher custom duties and taxes on imported goods in order to protect local production. However, because of the free trade agreement with post-Soviet countries, imported goods from these countries are exempted from only custom duties. Thanks to this trade preference policy, the protection policy of local businesses is weakening, considering the higher valued import from post-soviet countries, especially with Russia. According to the SSC, import from Russia comprises 16% of total import at

1.8 billion dollars. However, being a member of WTO can bring economic benefits to Azerbaijan, including improving a better business environment. There are some examples of developing countries that are the members of WTO; they have successfully developed their economy and business environment.

Regional and Sectorial Disproportion of Economy

Another significant barrier to economic growth in Azerbaijan is the regional and sectorial disproportion of the economy. First of all, regional disproportion has historical roots that appeared in the 1800s. After oil reserves were explored near Baku, all the resources flowed to Baku because of oil. However, in the 1920s, during the industrialization period in the Soviet Union, not only was Baku industrialized, but also other regions gained benefit from industrial development.

Nevertheless, after independence, the regional differences started revealing sharply. As a capital city, Baku began to grow dramatically while other regions fell into recession. However, in the 2000s, the government adopted regional development programs in order to recover the regional economic activity, which was considered to decrease the rough regional inequality in the economy.

Table 2.4 shows the changes in the regional structure of the economy in the period of 2005–2018. The number of enterprises increased over the period, but there is still a huge difference between Baku and other regions. The situation in total production is not different. A significant part of the production belonged to Baku in 2005 and 2018, with 89.61% and 88.24%, respectively. This means regional economic development programs did not work efficiently.

This regional disparity made troubles for the economy, and it might be impossible to change the situation in the foreseeable future. As a result, most of the population resides in Baku or come to work in there. According to the SSC, 22.93% of the total population officially resided in Baku in 2018. However, a significant number of unregistered people permanently live and work in Baku. According to the calculations of the experts, the number of people in 2019 was approximately 4.5 million, which accounted for roughly 45% of the overall population.

Table 2.4. Comparison of regions in Azerbaijan

	Number of enterprises		% of total production	
Years / Regions	2005	2018	2005	2018
Baku	1302	1408	89.61%	88.24%
Absheron economic region	217	273	2.61%	3.20%
Ganja-Qazakh economic region	283	263	1.97%	1.76%
Shaki-Zagatala economic region	106	141	0.24%	0.56%
Lankaran economic region	78	96	0.21%	0.32%
Guba-Khachmaz economic region	76	96	0.44%	0.37%
Aran economic region	326	341	4.33%	3.29%
Karabakh economic region	27	40	0.04%	0.10%
Shirvan economic region	39	50	0.07%	0.06%
NAR	96	119	0.48%	2.11%

Source: https://www.stat.gov.az/source/regions/

Table 2.5. Sectorial share of industry

Years / Industrial sectors	2005	2018
Mining industry	67%	73.3%
Processing industry	25.9%	21.9%
Electricity, gas and steam production, distribution and supply	5.7%	4.1%
Water supply, waste treatment and processing	1%	0.7%

Source: https://www.stat.gov.az/source/system_nat_accounts/

Secondly, Azerbaijan lacks an efficient and diversified economy. Most of the industry production consists of the mining industry, such as the oil and gas industry, and the rest comprises mining of precious and non-precious metals and the value of services in the mining industry. Table 2.5 shows the change in sectorial share in the industry in the period between 2005 and 2018. During this period, the mining industry enlarged its share due to the increase in the volume of mine exploitation and price.

2.4 Shadow Economy

It is crucial to find the roots of the shadow economy in order to establish a proper economic policy, which struggles against the shadow economy. There are different theories and studies in the literature, which explain the possible causes of the shadow economy. However, the situation varies from country to country, while the empirical test of these theories gave adverse results because of different factors. However, there are primary causes of the bigger size of the shadow economy in Azerbaijan, which are examined in this study. Considering that, Azerbaijan's economy is a transition economy, and it is just 29 years of independence, the size of the shadow economy is understandable. Conversely, while making the comparison of the size of the shadow economy among the transition countries, it is apparent that some countries have overcome the challenges of the command economy and bad governance inherited from the past. As a developing country, the larger size of the shadow economy is a considerable risk, which threatens the fiscal freedom of the economy because of tax erosion. As a result, the collected revenues from tax undergo decrease. This case is appropriate for Azerbaijan's economy, as the significant part of budget revenues come from the Oil Fund, where the oil revenues are managed. According to the Law of the Republic of Azerbaijan on the state budget of the Republic for 2019, transfers from the Oil Fund consisted of 11.3 billion AZN, which accounted for 49% of budget revenues. If the funds are not transferred from the Oil Fund, the budget revenues do not let the government execute the budget expenditure. From that point, the bigger size of the shadow economy might be considered as a threat to fiscal freedom.

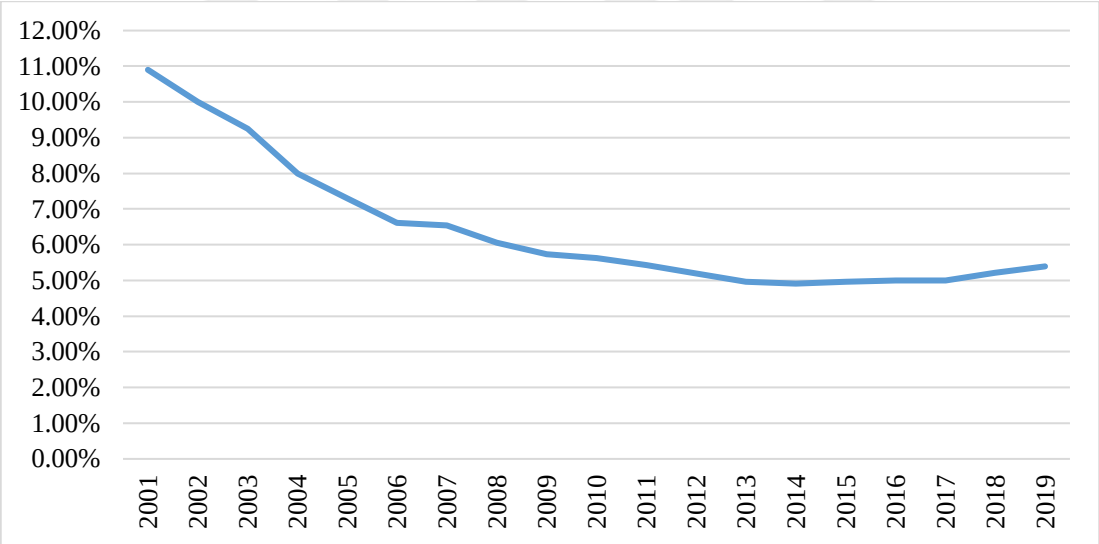
2.4.1 Causes of Shadow Economy

Several factors stimulate the existence and growth of the shadow economy. These causes can be organized in terms of social, economic, and financial aspects. The

importance of these factors is evaluated differently by scholars. While some of them emphasized the importance of economic factors, others stressed the social aspects. The causes of the shadow economy in Azerbaijan are analyzed briefly and supported by data.

Unemployment and Labor Regulation.

Unemployment is one of the factors, which results in macroeconomic instability. In terms of the shadow economy, there is a relationship between the size of the shadow economy and unemployment. While the unemployment rate is increasing, the individuals fail to find a job in the registered economy, and that is why they tend to work in the unregistered economy. According to the data from the SSC, the unemployment rate has slightly fluctuated around 5% over the past ten years, which means there have not been significant changes in unemployment. From Figure 2.6, it is evident that even if in the economic crisis of 2008 and devaluation shock in 2014, there was no significant change in unemployment. It might be the sign of inappropriate methodology or incorrect estimation of the unemployment rate



Source: https://www.stat.gov.az/source/labour/

Figure 2.6.Uunemployment rate in Azerbaijan

However, also according to SSC, only 8% of unemployed people registered in employment offices, and only 6% of registered people got payment for unemployment. However, SSC does not publish the number of people who work in the unregistered economy, and the calculation method is based on the International Labor Organization methodology. The individuals who worked in the unregistered economy were also included

in the list of employed people. However, most of the individuals are employed in the private sector, approximately 77%. Moreover, in 2019, the Ministry of Taxes initiated serious inspections in the enterprises in order to uncover the individuals who worked without a labor contract. Concluding all these facts, it is believed that a significant portion of people who work in the private sector is unregistered to the economy. In order to check this fact, there should be a comparison of the share of personal income tax revenues in total tax revenues. In 2019, personal income tax comprised roughly just 7% of total collected tax revenues, which meant the number of people who worked in the registered economy was considerably significant. For comparison, it is 45% in Georgia, 19% in France, and 24% in OECD countries.

Moreover, the law against employment without contracts was not correctly applied by the government, and that is why in 2019, the government began to crack down on the enterprises that employ without a labor contract. According to the Code of Administrative Offenses of the Republic of Azerbaijan, employing a worker without contract lead to penalties 1000-2000 AZN for a natural person, 200000-250000 AZN for a legal person.

The Share of Service Sector

The service sector creates a suitable condition for the shadow economy. In terms of tax auditing and inspection, it is difficult to define the actual income or profit of individuals or firms. From this point of view, the firms, which operate in the service sector, easily hide their income information and tend to decrease the declared amount. Similarly, the individuals who work at home may behave in the same way. According to the data, the service sector accounts for approximately 29% of GDP in Azerbaijan. Moreover, the weight of the service sector in Azerbaijan lags far behind developed countries. Especially in Azerbaijan, because of low wages, people moonlight, such as giving private lessons, offering taxi service with private cars, online selling, and consultancies.

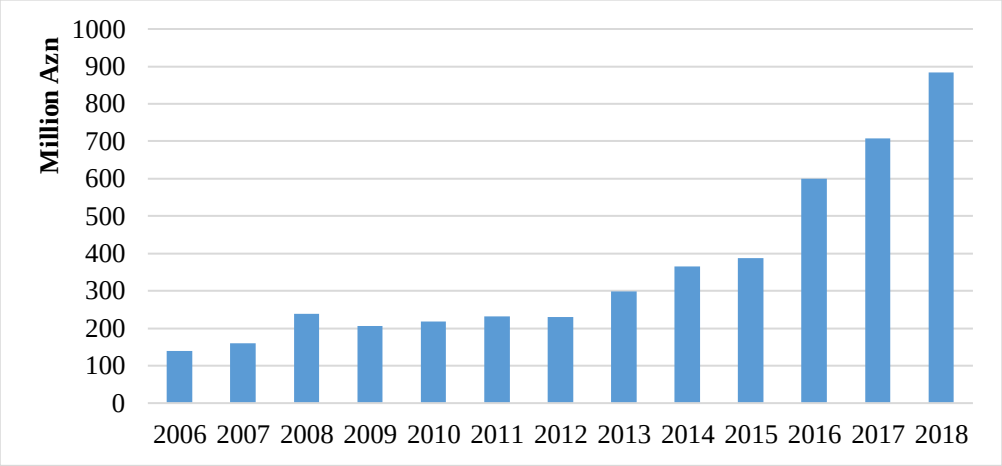
Unequal Income Distribution

Unequal income distribution is one of the most significant causes of the shadow economy. As the unfair level of distribution of income is increasing, individuals are inclined towards the unregistered economy in order to compensate their income level by not paying tax and increase their income. According to the data, the GINI index for

Azerbaijan was 28.6% in 2018; however, the average wage is two times higher than the minimum wage. Moreover, not only low-income people but also high-income people tend to hide their income not to pay more taxes.

Foreign Trade

The tariff and non-tariff barriers are one of the most important contributors to the shadow economy. Facing with the tariff and non-tariff barriers, individuals tend to bring the goods through smuggling or decrease the declared value of commodities. As a result, commodities enter the country through poorly controlled corridors or decreasing the value in declaration. Individuals try to pay less amount of taxes, which contributes to the shadow economy. According to the Chairman of State Customs Committee of Azerbaijan, Safar Mehdiyev, the higher taxes and customs duties on precious commodities, such as gold and its products, diamonds, etc. lead to smuggling. Considering that Azerbaijan is not a member of WTO, weighted average taxes on imported goods are higher than those in WTO member countries. This makes control over the imported goods difficult. However, in recent years, the revenues from customs duties have increased thanks to reforms in the customs system. Figure 2.7 shows the collected revenues from customs duties.



Source: https://customs.gov.az/az/faydali/gomruk-statistikasi/

Figure 2.7.Collected customs duties on import in AZN

It is important to mention that weighted average customs duty in 2015 was 5.7% and increased by up to 8% in 2018. Also, the volume of imports increased by 2.2 billion dollars. Considering the effect of the increase in weighted average duties and import

volume and considering other factors ceteris paribus, in 2018, it is expected to collect additional 179 billion dollars, which is equal to 305 billion AZN. However, the amount of collected duties reached 900 million AZN, which is approximately 200 million AZN more than expected value. Similarly, collected VAT and Excise tax on imports also increased through the strong control over the customs declarations.

Structure of Social Contributions

In Azerbaijan, one of the most critical factors, which make companies work in the shadow economy is the structure of social contributions. The problem is that when companies employ the worker, the majority of the social contribution of the worker should be paid by the employer. According to the latest legislation in the Tax Code of Azerbaijan, 22% of contributions should be paid by the employer, and 3% should be paid by the employee. As a result, companies are not keen on employing a worker by contract, as social contributions make net wages costly. In order to decrease their costs, they are inclined towards the shadow economy or avoid taxes through legal and illegal ways. Regarding the poor control over this issue, companies easily avoid making a contract with a worker. According to the Code of Administrative Offenses of the Republic of Azerbaijan, penalties for not paying social contributions are 1000 AZN and 3000 AZN for natural and legal persons, respectively.

Cash Payments

As a developing country, cash payments are much more popular than non-cash payments. It is important to know that cash payments play a major role in feeding the shadow economy. Not only companies but also people tend to use cash payments. Even companies are keen on transferring money from the bank account to cash accounts in order to avoid taxes. In order to eradicate this problem, the government started to apply 2% for the amount that was transferred to the cash account.

Similarly, in terms of individuals, the situation is the same. Although the government made POS terminals obligatory for some enterprises, people tend to pay cash. The reason can be the lack of trust in the banks or electronic devices, and there might be some psychological results. Especially low-income people do not need non-cash payments in daily life, which may be one side of this issue. According to the statistics of the Central

Bank of Azerbaijan, approximately 72% of the population have debit or credit cards; however, most of them are social and salary cards. According to the statistics of the Central Bank of Azerbaijan, the volume of operations through debit and credit cards was 23.2 billion AZN. However, the volume of drawn cash through different terminals was 17.3 billion AZN, which made 75.3% of total operations. These statistics quite make sense that cash payments have an advantage over non-cash payments. Moreover, the current President of the Republic of Azerbaijan, Ilham Aliyev, also mentioned that cash payments are a feeding source of the shadow economy, and the government should take measures in order to give incentives to people to use non-cash payments.

Demographic Problems

Because of the war in the 1990s, Azerbaijan suffered from demographic movement from the territories occupied by Armenia. A significant part of refugees moved to Baku in order to find a place to live and work. Simultaneously, not only because of war but also the regional disproportion of the economy, the people who used to live in the regions came to Baku, and until today this process has not stopped yet. As mentioned before, approximately 45% of the total population lives in the capital city, officially or unofficially. Moreover, most of the universities are situated in Baku, which accelerates this demographic movement. As a result, there is extra-supply of labor, which creates the problem in terms of employment and provide a lower cost of labor in terms of firms. Regarding labor surplus, people who cannot find a job in the registered economy are inclined to work in the unregistered economy in order to make their living. In conclusion, comparing the demographic factor with other factors, the seriousness of this issue is more conspicuous.

Penalties for tax avoidance

Penalties for tax avoidance are regulated by the Code of Administrative Offenses of the Republic of Azerbaijan and the Criminal Code of the Azerbaijan Republic. If the avoided amount of tax is not more than 20.000 AZN, in accordance with the Code of Administrative Offenses, the subjects are fined 30-70% of the avoided amount of tax. Moreover, if the amount is more than 20.000 AZN, there are both money and jail penalty according to the Criminal Code.

3. Literature Review

This chapter examines the existing literature related to the relationship between the shadow economy and economic growth. Moreover,the theories related to economic growth will be reviewed.Nevertheless, there are a few empirical pieces of research with regard to the effect of the shadow economy on economic growth. No clear and indisputable empirical and theoretical findings can be concluded (Schneider and Enste 2000). The main point is to decide whether the shadow economy is a positive phenomenon in terms of economic growth or vice versa.

First of all, according to the conventional view, which is constructed on a simple neoclassical model, that the total volume of economic output in a country is ceteris paribus, according to the assumption of full factor employment, so that the shadow economy may grow only at the cost of economic output in the formal sector. According to this view, an entity has two options, going to the informal economy or staying formal. In this condition, total GDP will even diminish, as company performance is lower in the shadow economy rather than in the formal economy. According to Loayza (1996), excessive tax burden and over-regulated economy and government interference will give the incentive to the growth of the shadow economy, which hurts economic growth.

Secondly, according to another view, the informal economy can give incentives to increase economic growth. According to an empirical study carried out by Schneider (1999), two-third of income earned in the informal economy in Germany and Austria is spent on consumption in the formal economy, and as a result, it boosts the growth of the formal economy. Moreover, the positive effect of the shadow economy on consumption is experienced in the UK. (Bhattacharyya 1999).

According to Loayza (1996), whose research is based on Latin American countries, decreasing the shadow economy leads to the increasing growth of the economy. His main argument was, as the shadow economy decreases, the collected tax revenues increase, which results in quality and quantity growth in public goods and services and spurs economic growth. This hypothesis was empirically proved and concluded that any increase in the volume of the shadow economy gives rise to the diminishing growth of registered GDP.

According to Kaufmann and Kaliberda (1996), in the post-socialist countries, the shadow economy causes the registered GDP to diminish, particularly in the countries that face a significant decrease in registered GDP. Over half of the decrease in official GDP stem from the reduction in overall economic activity. However, the other part is digested by the informal economy. Using Ordinary Least Squares regression, they come to an end that the portion of the informal economy in total GDP increases by nearly 4% for each 10% of the cumulative drop in official GDP.

Eilat and Zinnes (2000) came to an essential conclusion relevant to transition economies, displaying that, there may be an inertia effect while the introduction of the informal economy and hysteresis results in destruction. If total economic activity drops, a decline in GDP of one dollar is connected to rise inside the unofficial economy by 31 cents, meaning that the unofficial economy diminishes the fall of official GDP. On the opposite side, if total economic activity grows, a one-dollar increase in GDP causes a drop of only 25 cents within the unregistered economy.

Schneider (2004) stated that the shadow economy hinders the economic growth in developing countries, but has a positive impact on the economic growth in developed countries. According to the conclusions of this econometric analysis, which includes 21 OECD countries and 89 developing and transition countries, in developed economies rise in the shadow economy of 1 percentage point of GDP generates an escalation in official GDP of 7.7 %. On the opposite side, in developing economies 1 percentage point increase in the informal economy cause a 4.9 % decrease in official GDP, considering other variables ceteris paribus. One justification for these conclusions is that an increase in unregistered economy in developed economies may spur the formal economy by generating extra income that supports formal economy consumption. Moreover, in developing economies, a bigger size of the shadow economy causes a significant deterioration of the tax base, which results in low-quality public services and goods, which in turn leads to lower economic growth.

According to the study conducted by USAID (2005), there is no correlation between the growth rate of GDP and the informal economy, and there is not any empirical confirmation of the hypothesis that a reduction in the shadow economy automatically results in higher economic growth, and vice versa. Nevertheless, economies with higher GDP per capita tend to have a small scale of shadow economies, and it cannot be

concluded if the formalisation is the cause or consequence of the high level of economic development. The scholars also set forth that the available series of data on changes to the shadow economy is not long enough to prove or reject the hypothesis that countries with high rates of economic growth can diminish their size of shadow economy faster than those with a lower rate of growth.

According to an empirical study carried out by Goel (2017), the effect of the shadow economy on economic growth can be both positive and negative. His research employed the ARDL error correction model over the century and a half and measured short term and long term dynamics of economic growth and shadow economy in the USA. Although other determinants of economic growth included, the author stated that the effect of the shadow economy before World War II was negative, and after the war, the impact of the shadow economy on economic growth turned positive.

Economic growth is the increase in overall production of economic goods and services. While there are some determinants of economic growth,thoughts of scholars are different.

Review of economic growth theory started with the name of Joseph Schumpeter. While the classics consider accumulation of capital as the main source of economic growth, Schumpeter(1934) brought new ideas related to economic growth. According to his ideas, capital accumulation is not enough for economic growth and there is need for innovative entrepreneurship for economic growth. The process of production happens with the help of material and immaterial things. He stated innovation as follow:

1. The introduction of a new product

2. The introduction of a new method of production

3. The opening up of a new market

4. The conquest of a new source of supply of raw materials or semi manufactured goods

5. The carrying out of the new organisation of any industry like the creation of a monopoly

Moreover, he considered the role of the entrepreneur crucial in economic growth. However he stated that,there should be suitable conditions for entrepreneurs such as:

1. Available technical know-how for production of new economic goods

2. Financial institutions and banks for borrowing in form of credit and capital.

Another theory was introduced by Arthur Lewis(1954) who focused on countries which is poor but have rich labour resources. His main ideas accompanied the classical economists. The model developed by Lewis consider low level of life in the short run for increased level of savings. Moreover, low level of life in the short run leads to increase in the accumulation of capital and as a result it will cause to economic growth in the long run.

After Arthur Lewis, Simon Kuznets introduced a theoretical support for Lewis's theory. According to Kuznets(1955), in the early stages of growth there are economic disparities which is proved by empirical analysis. Moreover, he analyzed the dynamics of economic growth and urban population and concluded that there is positive relationship between economic growth and the share of urban population.

However, the assumptions of Lewis's theory are hard to confirm. As the capital accumulation increases because of low level of life in the short run, it affects the quality of life of people overall.

Rostow(1960) developed another economic growth theory which implies that there are five stages of economic growth as follow:

1. Traditional community: Economy is mostly based on agriculture and there is existence of low level of trading.

2. Preconditions to take-off: In this stage manufacturing is sophisticated and as a result production is increased.

3. Take off: This stage is a short period of rapid growth accompanied with concentrated industrialization.

4. Drive to maturity: In this stage the level and quality of life increases thanks to the using of technology.Moreover national economy is diversified.

5. Age of huge consumption: Last developed stage which is the flourishing stage of capitalism that brings mass production and consumerism.

Also according to Rostow, the most crucial and important stage for poor countries is take off which brings industrialization. In 1970 he added next stage of economic growth, which called “quality”. In this stage it is considered that the quality of produced goods are continuously improved.

4. Data and Methodology

In this section, the sources of data and the methodology will be explained. The methodology is based on Vector Autoregression (VAR) (developed by Sims (1980) and Sun et al. (2010)) which is an ad hoc dynamic multivariate model, treating simultaneous sets of variables equally, regressing each endogenous variable on its own lags while the lags of all other variables in a finite order system are explained. All the variables are tested for stationarity and order of integration by using Augmented Dickey-Fuller (ADF) Unit Root Test (Dickey and Fuller 1981). Moreover, the model is analyzed through the VAR Granger Causality test individually and jointly, as in the Wald Test (1943).

4.1. Data

This research uses time-series data for the analysis. The data is taken from the period of 1991–2017, which starts from the independence of Azerbaijan and ends in the year at which the latest data is available. Data has not been provided for the years before independence and for recent years, because the government of Azerbaijan has not officially published the shadow economy statistics and data from The International Monetary Fund (IMF) and the Association of Chartered Certified Accountants (ACCA) reports has been extracted as an alternative resource. Another variable, economic growth data, has been taken from the SSC. All the data used in this study is annual data, and shadow economy data is expressed as a percentage of GDP and economic growth data as a percentage. Considering that the data of economic growth is negative for some years and taking logs of negative numbers is impossible, formula employed for economic growth data.

4.2. Methodology

4.2.1. Logarithmic Transformation

Through the logarithmic transformation of variables in a regression model, it is a general approach to manage the situation where there is a nonlinear relationship, which exists between the independent variable and dependent variables.

4.2.2. Unit Root Tests

In most cases, the data series are non-stationary or grows over time, which can be problematic while running a model during econometric analysis. Moreover, it could make the econometric model insignificant, even for any kind of analysis of the variables, which have unit root or non-stationarity could generate the spurious regression problem. If stationarity is seen in the data series, you can achieve a result, but it would be an insignificant result. The solution to the variables that are not stationary at the level is taking the first difference of the data series. If the variables do not become stationary or have unit root after taking the first difference, as next step the second difference of the series should be taken to shift the data to the stationary position, and if time series data is stationary, fundamental statistical properties of data will remain constant over time. For examining the existence of the non-stationarity or unit root, there are some econometric tests, and the most prevalent is the Augmented Dicky-Fuller (ADF) unit root test. In this research, the stationarity of the time series is obtained by employing the Augmented Dicky-Fuller (ADF) unit root test at the levels and first and second difference, which could transform the data series to the stationarity.

4.2.3. Augmented Dickey-Fuller Unit Root Test

Testing for the stationarity, Dickey and Fuller (1979) established a unit root test, which is set up very well. The basic autoregressive unit root test, which accommodates general ARMA models with the unknown trend, is referred to as the Augmented Dickey-Fuller (ADF) test. The ADF test is constructed on estimating the test regression. Actually, three ADF tests are run to the regression, the first regression includes both constant and trend, the second one includes just constant, and the third one includes neither trend nor constant. In this study, the regression includes both of them (constant and trend).

$$\Delta Y_t = C + T + \alpha y_{t\text{-}1} + \sum \beta_i \Delta y_{t\text{-}i} \qquad (1)$$

The specifications of the abovementioned model are stated as:

ΔY_t: Change in Y

T: Trend

C: Constant

β: Coefficient

α: Coefficient

t: Year (1991-2017)

The regression above is used to examine the following hypothesis:

$H0: \alpha = 0$ (this hypothesis says that the time series is integrated of order one, like unit root or non-stationary)

$H1: \alpha < 0$ (this hypothesis says that time series is integrated of order zero, like stationary or do not have unit root)

If α is significantly smaller than zero, then the null hypothesis, which support that, the time series has unit root or is not stationary will be rejected and the alternative hypothesis, which means that Y_i is stationary, will not be rejected.

4.2.4. LAG Selection

Based on the Akaike Information Criterion, the lag lengths are selected. Akaike's information criterion (AIC) measures the quality of statistic models set to each other, and then choosing this lag length allows the model to be run and fitted well.

The formula below which allows the best lag length to be selected is as follow:

$$AIC = n\, log^{(\hat{\sigma}^2)} + 2K \qquad (2)$$

Where:

$(\hat{\sigma}^2)$ = residual sum of squares/n

n =sample size

K =the number of model parameters

Although there are a few ways to select the lag length, such as the KPSS test, in most cases, the AIC is the most useful one, and that is why in this study, the lag length will be selected on the basis of AIC.

4.2.5. Vector Autoregression (VAR) Model

Vector autoregression (VAR) model is one of the most useful, flexible, and successful models for macroeconomic forecasting. It is easy to use this model for the analysis of multivariate time series data. The VAR model was developed by Sims (1980), who proclaimed that, if there is true simultaneity among a set of variables, they should not be predetermined as exogenous or endogenous, and they should instead be treated equally. Moreover, the VAR model is also used for policy analysis. Under the structural analysis, some specific assumptions related to the causal structure of the data under investigation are imposed, and the causal impacts of unexpected shocks or innovations of specified variables on the variables are summarized. In general, these causal impacts have been reviewed with impulse response functions.

The model of the VAR with time series Y_i and Z_i and one lag selection can be written as follow:

$$y_t = \delta_0 + \alpha_1 y_{t-l} + \gamma_1 z_{t-l} + u_t(3)$$

$$z_t = \eta_0 + \beta_1 y_{t-l} + p_1 z_{t-l} + u_t(4)$$

Where U_t is the error term with zero expected value given past information on Y and Z and each variable only depends on the previous Y_i and Z_i but can be extended to depend on different combinations of the previous k value of both variables, and all the variables are considered as endogenous.

4.2.6. VAR Granger Causality

The Granger causality test is a statistical tool for deciding whether a time series is functional in forecasting another time series. VAR Granger Causality test was first proposed in 1969. The main difference between the Granger causality test and other tests is that it mainly focuses on determining if one variable forecasts another variable rather than determining one variable causes another variable.

$$E(yt|It\text{-}l) \neq E(yt|Jt - l)$$

Where $It\text{-}l$ holds information of past and z while $Jt - l$ holds only information of past, it can be said that z Granger causes y. Nevertheless, it is called a causality test, and it only assumes a correlation between the current value of y and past values of z. The trends in z could directly evoke trends in y, but by no means does it prove it.

The variables in this thesis are the economic growth and shadow economy, and here the Granger Causality test is used individually to answer whether the shadow economy causes economic growth or economic growth causes shadow economy.

4.2.7. The Impulse Response Function

Nevertheless, the Granger Causality test is one of the best tests to prove the link between variables in a VAR model; it will not be able to provide the specific response that whether there is a negative or positive connection among them or how long the effect of change in one variable lasts for another variable. For this reason, the impulse response function is required to define the existing connection, which can be either positive or negative among the variables, could be clarified according to Gujarati (2009)

The impulse response is the derivative with respect to the shocks. Impulse response at horizon h of the variables to an exogenous shock to variable j is as follow:

$$\frac{\partial y_{t+h}}{\partial \in_{j.t}} = \frac{\partial}{\partial \in_{j.t}} (\prod y_{t+h-1} + \in_{t+h-1}) = \frac{\partial}{\partial \in_{j.t}} (\prod^{h+1} y_t + \sum_{i=0}^{h} \prod^{i} \in_{t+h-1}) \qquad (5)$$

Taking derivative will eliminate all terms but one, which is $\prod h \in t$, as a result, we get the following equation:

$$\frac{\partial y_{t+h}}{\partial \in_{j.t}} = \frac{\partial}{\partial \in_{j.t}} (\prod^{h+1} y_t + \sum_{i=0}^{h} \prod^{i} \in_{t+h-1}) = \frac{\partial}{\partial \in_{j.t}} \prod^{h} \in_t = \prod^{h} ej \qquad (6)$$

In this study, the result of the impulse response function is taken out, and the result is interpreted

4.2.9 VAR Model for Azerbaijan

The VAR model for Azerbaijan is explained by its equation as following, but before that, its variables are introduced.

The variables used in this study are economic growth, which is used as a dependent variable, and the shadow economy, which is used as an independent variable. Although there are more variables which can be the determinant of economic growth and can be used as independent variables, because of the number of observation, including more variables is meaningless. Moreover, considering that the main purpose of this study is to measure the effect of the shadow economy on economic growth, then it can make a sense.

After doing all the steps in the VAR model for Azerbaijan, we get the following shape:

$$EcGr = F(EcGr_{t-1}, EcGr_{t-2}, SE_{t-1}, SE_{t-2}) \quad (7)$$

$$SE = F(EcGr_{t-1}, EcGr_{t-2}, SE_{t-1}, SE_{t-2}) \quad (8)$$

EcGr =C(1)*EcGr(-1) + C(2)*EcGr(-2) + C(3)*SE (-1) + C(4)*SE (-2) + C(5)

SE=C(6)*EcGr(-1)+C(7)*EcGr(-2)+C(8)*SE(-1)+C(9)*SE(-2)+C(10)

There will be diagnostic testing for the abovementioned 2 equations, and the heteroskedasticity, normality, serial correlation, and stability will be checked.

EcGr: Real Economic Growth in percentages

SE: Shadow economy as a percentage of GDP

C (5) and C (10) are the constants

C (1), C (2), C (3), C (4 C (6), C (8), C (9) are the coefficients

5.Empirical Results

In this chapter, the empirical result of the model will be illustrated, and there will be some discussion related to the results.

5.1. Empirical Results

Before running the VAR model, the ADF unit root test was employed. The results of the ADF test indicate that the dependent variable is stationary or has not unit root at the level, and both independent variables are stationary at the first difference. The following table presents the test results.

Table 5.1. Unit Root Test Result for Level

Variables	t-Stat	1%	5%	10%	Prob
EcGr	-1.856	-3.711	-2.981	-2.629	0.34
SE	-1.514	-3.724	-2.986	-2.632	0.51

Table 5.2. Unit Root Test Result for First Difference

Variables	t-Stat	1%	5%	10%	Prob
EcGr	-6.688	-3.724	-2.986	-2.632	0.00
SE	-3.235	-3.724	-2.986	-2.632	0.0297

After testing the stationarity and checking unit root in order to run the model, there should be a decision about the lag selection. There are more criteria for lag selection like Final Prediction Error (FPE), Akaike Information Criteria (AIC), Schwarz Information Criteria (SIC), Hannan-Quinn Information Criteria (HQ), and LR test. AIC is the most acceptable one. According to the following result, we can see that AIC and all other criteria point for the 2 lags, so the lag is selected 2 and run the model.

Table 5.3. Lag Selection Criteria

Lag	LR	FPE	AIC	SC	HQ
0	NA	0.001145	-1.096278	-0.998107	-1.070233
1	10.82	0.000957	-1.278205	-0.983692	-1.200071
2	13.97*	0.000647*	-1.680294*	-1.189438*	-1.550069*

* Indicates lag order selected by the criterion, LR is sequentially modified LR test statistic (each test at 5% level), FPE is Final prediction error, AIC is Akaike information criterion, SC is Schwarz information criterion and HQ is Hannan-Quinn information criterion.

After taking log transformation and making variables stationary, according to lag selection criteria, the model will be run, and as a result, there will be two equations, and each variable will be taken as the dependent on its own two lags and another variable with two lags.

5.2. The VAR Model Results and Diagnostic Tests

After running the VAR model, it produces a result for both equations mentioned above:

$$EcGr = 0.59 * EcGr(-1) - 0.41 * EcGr(-2) + 0.11 * SE(-1) + 1.22 * SE(-2) + 0.07 \quad (9)$$

$$SE = -0.06 * EcGr(-1) + 0.01 * EcGr(-2) + 0.34 * SE(-1) + 0.18 * SE(-2) + 0.01 \quad (10)$$

However, this result is not conclusive, and in order to have a significant result, the model should be tested. That is why, as the next steps, there will be testing for heteroscedasticity, normality, serial correlation, and stability for every two equations separately, and results will be interpreted.

$$EcGr = F(EcGr_{t-1}, EcGr_{t-2}, SE_{t-1}, SE_{t-2}) \quad (7)$$

Table 5.4. VAR results of equation 7

	Coefficient	Std. Error	t-Statitic	Prob
EcGr(-1)	0.595746	0.180109	3.307691	0.0037
EcGr(-2)	-0.416569	0.096173	-4.331451	0.0004
SE(-1)	0.117156	0.855578	0.136932	0.8925
SE(-2)	1.221460	1.739775	0.702079	0.4911
Constant	0.078711	0.065800	1.196214	0.2463

In equation 7, Economic growth is taken as a dependent variable, and as independent variables, 2 lags of economic growth and shadow economy are chosen. In Table 5.4, VAR estimation results are presented. Through the VAR model, coefficients have been estimated. It is evident from the graph that the first lag of economic growth has a positive effect on economic growth; however, the second lag of economic growth affects economic growth negatively. The impact of both lags is significant as it is seen from the probability, which is smaller than 0.05. One of the possible explanations of the negative effect of the second lag is the unstable economic growth during the period. Surprisingly, both lags of shadow economy have a positive impact on economic growth. However, according to the probability of coefficients, they are insignificant, and nothing can be concluded.

Table 5.5. Diagnostic Test of equation 7

Normality test	**Jarque- Bera**	**Prob**
	3.027290	0.220106
Serial correlation LM test	**Obs*R- squared**	**Prob.Ch square**
	6.423804	0.0403
Heteroskedasticity test	**Obs*R- squared**	**Prob.Ch square**
	3.872045	0.4236
Stability test	Cusum test (5% significance) Not stable	

According to the diagnostic test of equation 7, the error term is normally distributed as the Jarque-Bera test confirms it. Probability 0.22 is greater than 0.05, and the null

hypothesis cannot be rejected. There is no heteroscedasticity problem but serial correlation. Moreover, the Cusum test shows that the model is not stable.

$$SE = F(EcGr_{t-1}, EcGr_{t-2}, SE_{t-1}, SE_{t-2}) \quad (8)$$

Table 5.6. VAR results of equation 8

	Coefficient	**Std. Error**	**t-Statitic**	**Prob**
EcGr(-1)	-0.066673	0.049077	-1.358537	0.1902
EcGr(-2)	0.014348	0.026206	0.547533	0.5904
SE(-1)	0.348162	0.233131	1.493421	0.1517
SE(-2)	0.181423	0.474059	0.382702	0.7062
Constant	0.011079	0.017929	0.617902	0.5440

In equation 8, the shadow economy is taken as the dependent variable, and as independent variables, 2 lags of economic growth and shadow economy are chosen. In Table 5.6, VAR estimation results are shown. The first lag of economic growth has a negative impact, and others have a positive impact, but not significant.

Table 5.7. The diagnostic test of equation 8

Normality test	**Jarque- Bera**	**Prob**
	194.7224	0.000000
Serial correlation LM test	**Obs*R- squared**	**Prob.Ch square**
	1.411696	0.4937
Heteroskedasticity test	**Obs*R- squared**	**Prob.Ch square**
	0.517709	0.9718
Stability test	Cusum test (5% significance) stable	

According to the diagnostic tests, the error term is not normally distributed, and there is no heteroscedasticity and serial correlation problem. Moreover, the Cusum test shows that the model is stable.

5.3. Impulse Response

With the help of impulse response function, the effect of independent variables on dependent variables can be figured out. Considering the research question of this study, whether the shadow economy affects economic growth or not, impulse response tables provide clear information.

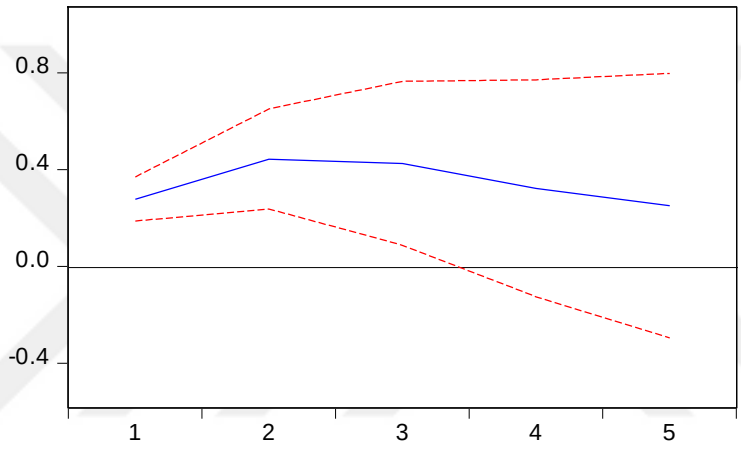


Figure 5.1 Accumulated Response of Economic growth to Economic growth

Figure 5.1 shows the impulse response of economic growth to itself. From the graph, it is obvious that, if the shock is given to economic growth, its effect on itself will be positive and significant and lasts 3 years. Although for the next years, the effects are positive but insignificant because of the confidence interval.

Figure 5.2 shows the impulse response of economic growth to the shadow economy. Although after giving shock to the shadow economy, the economic growth is positively affected, the result is insignificant because of the confidence interval.

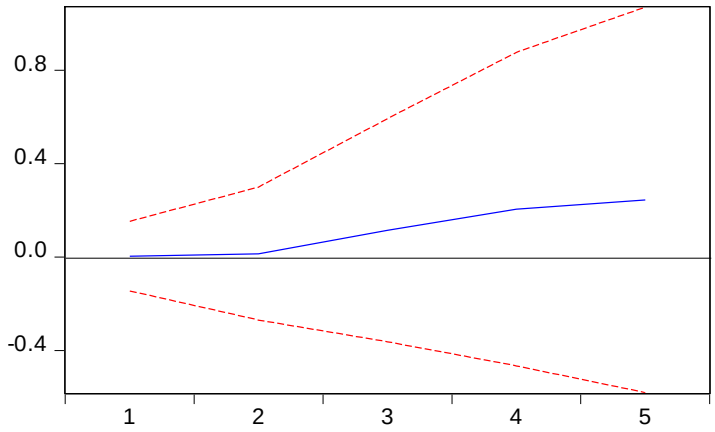


Figure 5.2 Accumulated Response of Economic growth to Shadow economy

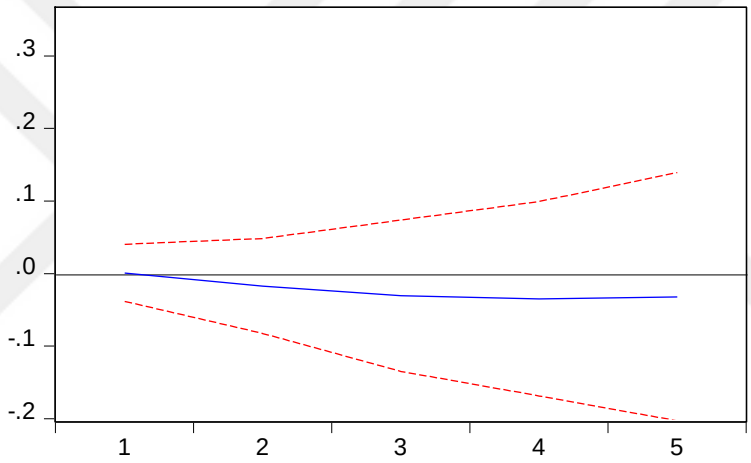


Figure 5.3 Accumulated Response of Shadow economy to economic Growth

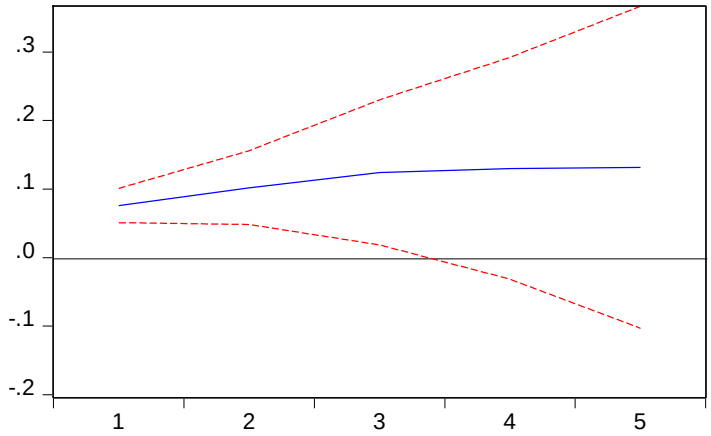


Figure 5.4 Accumulated Response of Shadow economy to Shadow economy

From Figure 5.3, it is evident that, if the shock is given to the economic growth shadow economy gradually decreases, but the result is insignificant due to the confidence interval. However, Figure 5.4 implies that if the shock is given to the shadow economy, it will have a positive effect on itself in the next three years.

5.4. VAR Granger Causality

According to the results of the VAR Granger Causality test, there is no significant relationship between economic growth and the shadow economy. Through VAR Granger Causality test, it is clarified whether independent variable cause dependent variable or not. In the first part of analysis, economic growth is taken as dependent variable and null hypothesis is that shadow economy does not cause economic growth. As the probability is more than 0.05,null hypothesis can not be rejected.Similarly,null hypothesis which implies that economic growth does not cause shadow economy can not be rejected according to the second part of analysis.

Table 5.8. VAR Granger Causality for Economic Growth and Shadow Economy

Dependent variable: EcGr			
Excluded	**Chi-sq**	**df**	**Prob.**
SE	0.668670	2	0.7158
ALL	0.668670	2	0.7158
Dependent variable: SE			
Excluded	**Chi-sq**	**df**	**Prob.**
EcGr	1.846390	2	0.3972
ALL	1.846390	2	0.3972

Moreover, economic growth and shadow economy cannot forecast each other according to this test. In other words, if any policy changes accrue to the shadow economy, economic growth will not be affected and vice versa.

6. CONCLUSION

This research examines the effect of the shadow economy on Azerbaijan's economic growth in the period of 1991–2017. While there are many studies related to the determinants of growth, this study focuses on the effects of the shadow economy, and literature on this issue is quite limited, especially for Azerbaijan.

According to this study, the effect of the shadow economy on Azerbaijan's economic growth during 1991 and 2017 is overall insignificant. However, after running the VAR Granger Causality test, it is uncovered that there is not any significant relationship between the shadow economy and economic growth, or in other words, these two variables do not forecast each other. Moreover, according to this test, if there are any policy changes related to the shadow economy, it will not lead to changes in economic growth and vice versa.

However, the main findings of this study do not support the hypothesis that the shadow economy has a negative impact on economic growth. However, in literature, there is some empirical evidence, which supports the non-existence of the relationship between the shadow economy and economic growth. According to the empirical study carried out by USAID (2005), there is not any significant connection between the shadow economy and economic growth. Moreover, diminishing the size of the shadow economy does not mean that the rate of economic growth automatically surges. One of the possible explanations of the insignificant effect of the shadow economy on Azerbaijan's economic growth can be the main drivers of the economy. As mentioned in previous chapters, Azerbaijan's economic growth fluctuated over the years because of different reasons, such as war, oil price variations, and devaluation shocks. Considering that the oil revenues spur the economic growth and also fluctuates it, then the insignificant effect of the shadow economy could be explained by this issue.

Secondly, the main reason for the bigger size of the shadow economy can be ascribed to fluctuated economic growth. Even if the years in which there was a higher rate of growth, there was not any significant decrease in the shadow economy. In literature, there are some studies, which support the argument that if there is not stable growth, the shadow economy does not tend to diminish. (Ikiz 2017). In other words, due to some economic crises or shocks, the individuals do not want to shift to the formal economy. This can be the case for the economy of Azerbaijan.

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