
COMPETITIVENESS IN AZERBAIJAN

Assessing Sectorial Economic Policies



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About the researchers

Ziya Alili, MSc, CFA candidate, is an Azerbaijan-based economist-researcher at the CESD and Director of the CESD School of European Studies. He earned his Bachelor of Science in Financial Management from Khazar University and his Master of Science in Risk Management from the University of Wales and the London School of Business and Finance. He has contributed to this paper with his econometric modeling skills and research expertise on Azerbaijan's economy in the development of policy recommendations. Alili has authored and co-authored the following relevant research papers:

- EU-Azerbaijan relations: Current Challenges and Prospective for Growth, 2013
- Accession to the Customs Union: Shaping the Strategy for Azerbaijan, 2013 (award-winning publication);
- Considering Accession to the Eurasian Economic Union: For Azerbaijan, Disadvantages Outweigh Advantages, 2013;
- Measuring the non-hydrocarbon sector in Azerbaijan, 2013;
- Azerbaijan's exclusion from the Generalized Scheme of Preferences of the European Union: Impact assessment for hazelnut and pomegranate juice exports, 2013.
- Estimating the impact of the global financial crisis to the economies of Azerbaijan, Armenia and Georgia, 2009 (award-winning publication);

Rashad Hasanov, MSc, is an economist-researcher at the CESD. He earned his Master of Science in International Trade and Development at the Azerbaijan Cooperation University, and has extensive experience in researching Azerbaijan's economy and developing policy recommendations. His experience and in-depth knowledge of the economy of Azerbaijan was very beneficial while developing policy recommendations. He has authored sev-

eral research papers, including:

- Measuring the non-hydrocarbon sector in Azerbaijan, 2013;
- Mortgages in Azerbaijan: Policy recommendations for development, 2013

Farhad Bayramov is an economist-researcher at the CESD School of European Studies. He is currently studying towards academic degrees at the Azerbaijan State Economic University and at the Department of Public Finance at Istanbul University simultaneously. Farhad was an Erasmus LLP exchange student at the Business Management School of the Queen's University Belfast in the United Kingdom. Farhad has also co-authored a CESD paper entitled »Mortgages in Azerbaijan: Policy recommendations for development«. His economic knowledge and background were quite beneficial while specifying the econometric tools and developing policy recommendations.

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1. Introduction

Sustainable growth through economic diversification is a typical goal of any economy in today's world. It is a widely targeted and tackled problem in developing countries as well. According to the Revenue Watch institute, many resource-rich countries depend heavily on cash flows generated by mining or oil production, which in turn jeopardizes sustainable growth. This is borne out by the lack of clear policy guidelines on diversification as well as policymakers' limited interest in the importance of diversification.

Accordingly, policymakers need studies on economic diversification and future economic challenges. A study encompassing the views of the most prominent experts and government officials backed by econometric models is therefore extremely important. Thus, this study compiles and analyzes the views of experts and government officials and backs them up with quantitative econometric modeling.

1.1. Purpose of the study

This study assesses economic diversification and cross-sector competitiveness in Azerbaijan by employing extensive qualitative and quantitative methodologies. The paper will measure the extent to which Azerbaijan's economy is labor- and GDP-diversified or not. If it is not, we must ask what kind of policies can be developed for sectorial diversification and economic development. This paper will further analyze the government's fiscal and monetary policies aimed at developing better, quantitatively based recommendations.

1.2. Research questions

Throughout this research paper, the researchers will answer the following questions:

1. To what extent is Azerbaijan's economy diversified?
2. What are the most successful policies of the government of Azerbaijan in sectorial development?
3. Do the government's policies generate competitiveness in a given sector?
4. How can future growth in different sectors be achieved?

The first question measures the economic diversification of Azerbaijan in terms of distribution of GDP and employment across sectors. The Herfindahl-Hirschman Index (HHI) and Ogive index are calculated over multiple years for the GDP and each year for employment to analyze changes in their trends. The second and third questions will be answered via views of experts and econometric models that have been widely used to assess sectorial monetary and fiscal policies. This assessment will allow us to generate policy recommendations for the future development of each sector. The fourth question will be answered by summarizing the experts' views and the results of the model.

1.3.Researcher

The Center for Economic and Social Development (CESD) was set up to promote the research and analysis of domestic economic and social issues with the purpose of positively influencing public policy and decision-making processes. The CESD works with and establishes a bridge between the government and the various representatives of civil society. Moreover, the CESD is also the top think tank in the region of Caucasus and Central Asia, and one of the top domestic economic think tanks in the world according to University of Pennsylvania. Harvard University has also deemed the CESD's research as a reliable source of information by including the center in its official think tank directory.

1.4. Structure of the paper

The following section discusses the qualitative and quantitative methodologies used in this paper and how the data was processed. The next section discusses each industry's historical GDP trends, unemployment rates and other relevant macroeconomic factors sector by sector, followed by expert views and modeling results. The section after that comprises policy notes for sectorial development that have been developed by analyzing the government's sectorial policies, surveying their views on sectorial developments and studying the results of the quantitative analysis.

2. Methodology

2.1. General methodology

This section explains the assumptions and limitations of the models so readers can better understand the results. To analyze the diversification of economic sectors of Azerbaijan, the researchers used two approaches:

- 1. Qualitative approach*
- 2. Quantitative approach*

The qualitative approach sought answers to research questions about the economy using non-numerical information such as interviewing prominent experts. As a result, the lists of sectorial guidelines were prepared based on the interpretations and observations of these experts regarding current conditions and future expectations. Experts included independent analysts and representatives of government agencies. Government representatives were given special attention as they have firsthand information on the government's sectorial policies. Interviewing these experts played a big role for the researchers while drafting sectorial proposals.

Details of the quantitative approaches are discussed in the next paragraphs:

2.2. Measures for economic diversification

The researchers also used quantitative methodologies as a tool to check the experts' arguments. Tools used to measure the diversification of the economy were an especially important measure. In order to analyze the concentration of economic activities in economic fields, including measuring economic diversification and investigating the existence of oligopoly, the researchers applied two methods:

- Herfindahl-Hirschman Index
- Ogive index

The Herfindahl-Hirschman Index (HHI) is widely used not only to measure market concentration and examine the existence of an oligopoly in an industrial economy, but also to evaluate economic diversity and macroeconomic specialization. The index is defined by following formula

$$\sum_{i=1}^N S_i^2$$

where S is the sectorial share and N is the number of sectors. From this equation, we deduce that, if each industry has an equal employment share, the equation will have the lowest degree, otherwise the higher degrees of the index will be observed if a country is only specialized in one industry.

The Ogive index was first implemented by Tress (1938) in to determine the diversity of economic sectors. Then, other economists, for example, Hackbart and Anderson (1975), and Attaran and Zwick (1987), also applied this method to measure the diversity of a country's entire economy:

$$OGV = N * \sum_{i=1}^N (P_i - 1/N)$$

where:

- is the sectorial share of GDP in the total GDP;

N – is the total number of sectors in the economy

If the result of estimating the Ogive index approaches 0 (zero), the diversity of the economy is high; otherwise the greater above 0 the result is, the less diverse the economy.

2.3. The vector autoregressive (VAR) model

In addition to the HHI and Ogive indices, the researchers used the vector autoregression model (VAR) to assess the impact of economic variables (particularly GDP) and investigate the effects of economic shocks. According to the Bank of England (2013), the VAR is a dynamic system of equations that estimates the relationships among economic variables by determining the linear dependence among a multiple time series. In the model, we consider some endogenous variables together, and it calculates the simultaneous equations explaining that each variable own lagged or past values and lagged values of all independent variables. In the early 1980s, the VAR was mainly developed as a modeling tool by Christopher Sims. To estimate the equations in the models in advance, we have to make sure that the predetermined (exogenous) variables are only current in some equations. However, Sims discovered a framework that called the traditional approaches into question. Sims and his followers argued that if there was real simultaneity among a set of variables, the variables should be used on an equal footing and we would not see any disparities between endogenous and exogenous variables. In a univariate autoregression there is a single-equation and single-variable model where the present value of the variable is explicated by its own lagged values. The VAR, which consists of an n-equation and n-variable linear model where all variables are in turn explained by their own lagged values, including the present and past values of the remaining $n-1$ variables. This is Sims' approach to the econometric model.

Estimating the VAR helps us analyze the influence of exogenous variables such as government spending, refinancing rates, money supply, tax exemptions, subsidies to GDP and investment. The movement of endogenous variables within VAR, which is the effect of exogenous variables shock, can be used as an instrument to investigate these shocks.

The model is best at answering questions such as:

- How do the past values of one indicator affect its current variable?
- How does the past value of one indicator affect the other variable's current/past values?
- What if the dependent affects independent variables and not the other way around?

The VAR, however, has the following weaknesses:

- It is sensitive to Lucas' critique, which argues that all models are subject to policy changes of governments, and that any estimation generated based on historical data will have no future implications if governments change their policies in a very short time.
- Existence of many lags or variables can cause poor performance when the VAR forecast model is calculated.
- VAR requires input figures to be normalized. The researchers chose a Johnson transformation to normalize the input data.

As discussed, the researchers have used the variables below as input figures. It shall be noted that each variable was different in different sectors. And some sectors had no information in a couple of given variables. Thus, the researchers dropped these variables and generated the sectorial VAR equation without the following factor:

- Sectorial GDP (endogenous variable)
- Sectorial investment (endogenous variable).
- Sectorial fiscal policy tools
 - Sectorial government spending (exogenous variable)
 - Sectorial tax exemptions (exogenous dummy variable)
- Monetary policy
 - M3, broader money supply in the economy, not in the sector (exogenous variable)
 - Refinancing rate in the economy as it is same for all sectors (exogenous variable)

These variables are abbreviated in the model as follows:

- | | |
|--|--|
| • Sectorial GDP | GDP or T_GDP (T= Transformed ¹ GDP) |
| • Sectorial investment | Inv or T_Inv |
| • Sectorial government spending | GS or T_GS |
| • Sectorial tax exemptions
no tax exemptions, | TaxE, dummy variable: 0:
1: tax exemptions |
| • M3 | T_M3 |
| • Refinancing rate | RR |

Having monetary policy and sectorial fiscal policy indicators regressed with sectorial GDP and investments allows the researchers to argue whether a particular fiscal policy, such as tax exemptions in agriculture, has been creating or destroying GDP, or attracting investments to the sector or not.

As an output, the VAR model generates the following figures: the regression coefficients, standard error and tests for each variable pairs; R-squared, Adjusted R-squared, Sum of Residuals; F-statistics, Akaike Information Criterion (AIC), Schwarz Criterion (SC) and other figures for each sector.

Coefficients of variable pairs measure the degree of impact of a one-point change in independent variable in dependent one(s), e.g., a coefficient of four of investments and GDP pairs shall be interpreted as a one-point change in dependent variable is reflected in the four-point change in GDP, holding all other independent variables constant. The signature of the coefficient indicates whether the impact was positive or negative: a negative (positive) coefficient of four would imply a one-point increase in investment, which will result in four-point decrease (increase) in GDP.

¹Transformed in this sense is a short abbreviation for Johnson transformations of the data. The GDP figures and other variables having “T_” abbreviation before their variable names were normalized accordingly to make the VAR eligible. It is requirement of VAR to have input data normalized.

The standard error of variable pairs measures the deviation in estimation of the calculated coefficient to correctly predict the actual figures. Although there is no benchmark to compare and infer from the standard error, the lower error is the better regression equation.

T-test for variable pairs are the “t-calculated” values calculated by the software on coefficients. T-figures are used for conducting a hypothesis test on the statistical significance of the variables independently. The hypotheses are:

- H₀: Coefficient = 0 (or, coefficient is not statistically significant)
- H_a: Coefficient NOT EQUAL to 0 (or, coefficient is statistically significant)

The R-squared figure defines the goodness of fit of the regression line, i.e., how good at explaining the given data the estimated line is. The closer to 1, the fitter and better the model is. Adjusted R-squared is introduced to prevent many independent variables from inflating the R-squared figure. In contrast to the R-squared figure, the adjusted R-squared figure measures the true goodness of fit in multiple regression analysis and its robustness against multicollinearity issues.

The sum of residuals is used to define the goodness of fit: how much of the change in dependent variables is explained by independent variables? The higher degree of explanation, the better the fit is. However, the figure is not the ratio, making it hard to measure the extent of the explanation.

F-statistics, the Akaike information criterion and the Schwarz criterion are the three measures to define the model specification. By model specification it is assumed the goodness of the model in explaining the given data. Given two models, the model with a higher F-statistics and lower Akaike and Schwarz criterion are defined as the best explanatory models. This was the decision-

making criterion in model specification. The model lowering Akaike and Schwarz values and maximizing the F-value was chosen for the analysis.

Having provided the necessary information to understand the methodology, we discuss the results in the next section, which starts with an analysis of economic diversification and is followed by an assessment of sectorial policies.

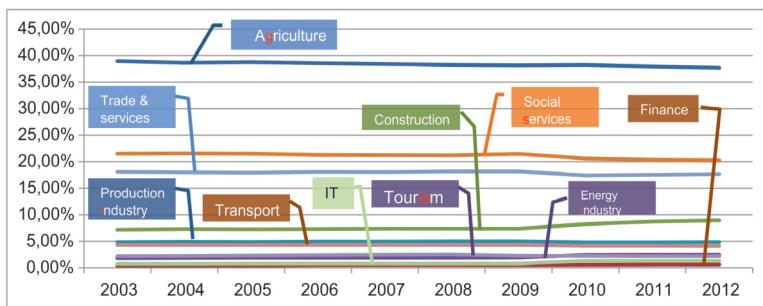
3.Diversification of Azerbaijan's economy

To analyze whether Azerbaijan's economy is diversified or not, the researchers have used two approaches: the Herfindahl-Hirschman Index (HHI) for the diversification of employment and the Ogive index for the diversification of GDP across economic sectors. The researchers start by discussing the HHI of employment diversification.

3.1.Employment diversification

In the figure below, the given lines describe the shifts in each economic sector's share of total employment. Most of the sectors have kept the same level of employment during these years. However, tourism and IT sectors had feasible changes between 2003 and 2012. The following graph visualizes the changes in sectorial employment for a clearer picture.

Figure 1 The shares of employment among economic sectors 2003–2012



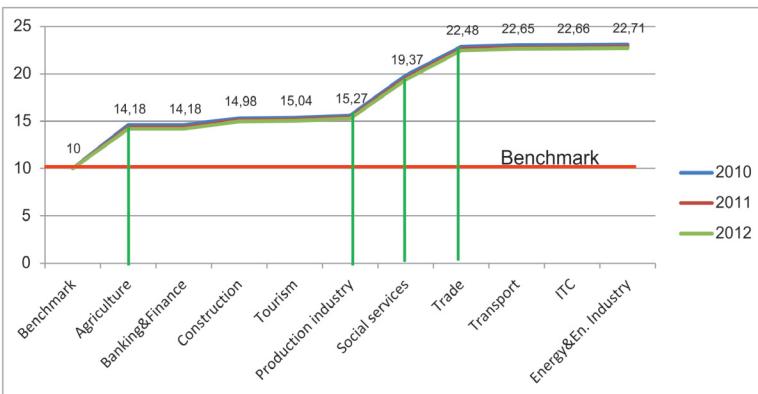
Source: Authors, graphed based on SSC data.

To assess labor diversification, the researchers employed the HHI as seen in Figure 2. An HHI below 0.01 (or 100 or 10%, depend-

² And almost for the last 10 years, as well. Thus researchers presented the last three years' figures.

ing on what figures one includes in the model) indicates a highly diversified economy. An index below 0.15 (or 1,500 or 15%) indicates an unconcentrated index. An index between 0.15 and 0.25 (or 2,500 or 25%) indicates a moderate concentration. The researchers interpret the index of above 0.25 (above 2,500 or 25%) as a high concentration. If the economy is equally diversified among 10 sectors, the HHI shall be 10%. This is the benchmark figure to interpret the table of the HHI, which is based on employment across sectors.

Figure 2 HHI of sectorial employment for 2010, 2011 and 2012



Source: Authors

The index reveals that the sectors creating distortions in labor diversification are agriculture, social services and trade. The idea is that the HHI jumped only in these sectors. The agriculture sector forces the index to jump four points higher than the benchmark. Banking, construction and tourism all change the index very modestly, or do not change at all. The next spike in the index is observed when the social services are taken into account, increasing by 4.10 points. The trade sector forces the index to get closer to its peak of 22.71. This peak figure and the trend in HHI has been the same for the last three years². Compare the peak

(22.71) with the HHI of an equally shared economy: 10. Thus, in terms of labor, Azerbaijan's economy lacks diversification.

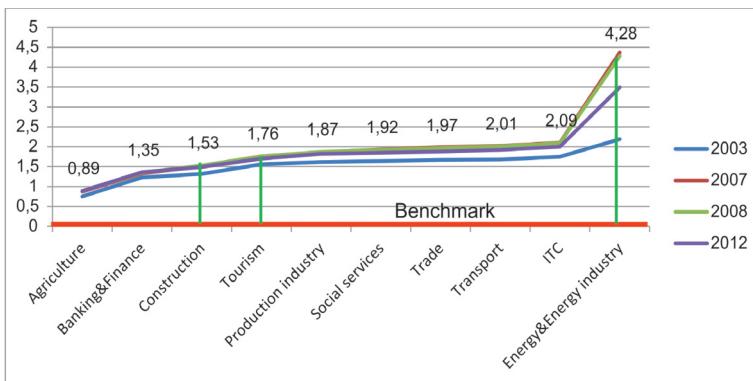
3.2.GDP diversification

As outlined in the methodology section, the Ogive index has been chosen to analyze the GDP diversification of Azerbaijan. The index for Azerbaijan is given below. The researchers preferred to present the index for only four years:

- Index for 2003, relatively diversified economy, prior to petrodollars
- Index of 2007–2008, the two top undiversified years
- Index of 2012 for the idea on the last year's diversification situation

The closer to 0, the better – i.e., more diversified – the index is. In our graph below, when the index touches zero, the economy will be fully diversified. Any deviations from zero would mean a non-diversified economy.

Figure 3 Ogive index of GDP diversification



Source: Authors

As the index shows, Azerbaijan's economy is relatively diversified without the tourism and energy and energy industry sectors. In all of the four chosen years, the index peaks when the energy and energy industry sector was included in the calculations. However, in 2003, the energy and energy industry sector distorted the economy less than in 2007 or 2008. Interestingly, in 2012, the energy and energy industry sector's slope decreased, indicating a lesser dependency on the sector in 2012, compared to 2007–2008. However, the index is still well above 0, signifying a non-diversified GDP.

These two indices show that Azerbaijan's economy is diversified neither in terms of GDP nor employment. Thus, the researchers need quantification of the sectorial policies for the development of policy recommendations. The section below discusses sectorial economic policies and develops policy recommendations generated based on discussion with prominent experts and model results. But first, the researchers provide sectorial development trends for a greater contextual understanding.

4.Sectorial policies of Azerbaijan's economy and their econometric assessment

This section first provides necessary background information on the sectors of Azerbaijan's economy and their historical developments. This covers past sectorial GDPs, unemployment trends and reforms until 2012. It then provides sectorial policies and the results of the VAR model.

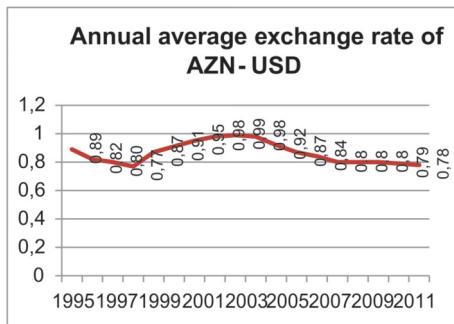
4.1.Banking sector

Azerbaijan's finance system became independent in 1991, when the USSR dissolved. Since then the banking system has been two-tiered: comprising a central bank³ and retail banks. The central bank controls the overall financial position of the banks in the second tier. The development of the banking system can be divided into two phases:

Phase 1: 1990 to the early 2000s. The National Bank of Azerbaijan was established on 12 February 1992. At the time, the banking sector in Azerbaijan was not very essential to the economy. It became important on 1 January 1994 when the manat was made the only legal tender in the country. However, inflation peaked with the change of currency. During this period, Azerbaijan received special help from the World Bank and the IMF, which Azerbaijan joined on 18 September 1992. The developmental priority of this period was to nurture the number of private banks and internalize the banking sector. That's why the government tried to make the banking environment more competitive and extend public access to banking services.

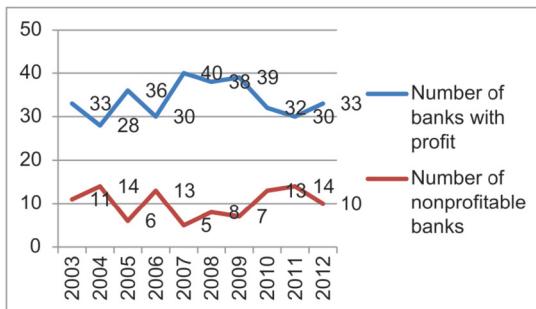
Phase 2: 2005 to the present. At the beginning of 2005, inflation began to rise again and peaked at 16% in the first half of 2006 due to the inflow of petrodollars, which forced the government to change the denomination of the manat on a scale of 1:5000, according to the *Azerbaijan Today: The International Magazine* (2013).

³"The National Bank of the Republic of Azerbaijan" till 18 March 2009

Figure 4 Average exchange rate of AZN-USD in CBAR

Source: The State Statistical Committee of the Republic of Azerbaijan (2013)

The exchange rate of the manat appreciated between 1995 and 1999 due to the stabilization of the economic situation. In 1999, the manat highly depreciated and the value of US dollar (USD) compared to the manat (AZN) rose from 0.77 to 0.87. This process continued until 2004. The main reason for the currency's depreciation from 2000 to 2004 was the government's devaluation of the manat to stimulate exports. In 2005, the AZN appreciated as oil income began to increase.

Figure 5 Profitability of Azerbaijani banks

Source: CBAR Financial results of banking activity (2013)

As we see in Figure 5, trends of banks with both profits and losses have been fluctuating. As the total number of banks remained nearly the same (minimum 42; maximum 46; 43 for the last year), the two trends mirrored one another. The number of banks operating at a profit sharply increased in 2007 from 30 to 40, and remained at nearly the same level until 2009. Although the global financial crisis negatively impacted most of the world's banks at this time, in Azerbaijan, the number of banks operating at a profit actually increased. The main reason for this was limited capital mobilization, which generated a lot of profit in Azerbaijan from 2007 to 2009. Beginning in 2009, however, the number of profitable banks began to decrease as the number of unprofitable ones increased because, although the crisis did not directly affect the financial sector in 2007, it began to harm other economic sectors. As a result, credit risks and non-performing loans increased, so the crisis's negative impact on both the financial sector and the economy in general was delayed, becoming visible only after 2009. Beginning in 2011, the financial sector began to recover.

4.1.1. Economic policy in the banking sector

The general VAR model for the sector is given with 2 lags, as 2 lags maximized F value at 50.7844 by decreasing AIC and SC to 0.622581 and 0.881147, respectively:

$$T_GDP = C(1,1)*T_GDP(-1) + C(1,2)*T_GDP(-2) + C(1,3) + C(1,4)*RR + C(1,5)*T_M3 + C(1,6)*TAXE$$

The VAR model with substituted coefficients.

$$\begin{aligned} T_GDP = & 0.568148896688*T_GDP(-1) - \\ & 0.00443824350922*T_GDP(-2) + 0.126261341789 - \\ & 0.321022826504*RR + 0.35122148199*T_M3 - \\ & 0.143291744594*TAXE \end{aligned}$$

As the equation implies, the short-term economic policy (lag 1

or one quarter) in the sector is better reflected in the sectorial GDP than the six-month policy (lag 2 or two quarters). This is implied by the signs of first and second lags for the GDP coefficients +0.568148896688 and -0.00443824350922, respectively. Moreover, the monetary policy of the government of Azerbaijan positively affected the sector: the M3 coefficient is the highest value among exogenous variables with a value of 0.35122148199. Unfortunately, the other tool of monetary policy, i.e., the refinancing rate, almost had the same negative impact on the sectorial GDP. Interestingly, tax exemptions did not increase the GDP in the sector. The model displays strong quality characters with R-squared, adj. R-squared and the sum of squared residuals figures of 0.888081, 0.870594 and 3.023759, respectively.

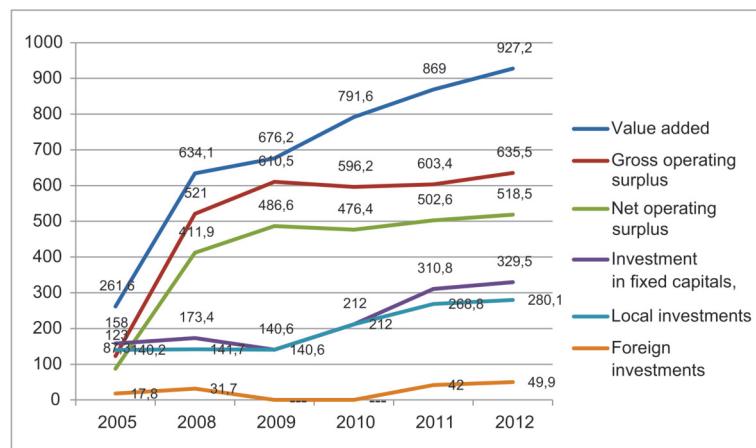
The model confirms the results of interviews with experts during the research process: that the refinancing rate harms the GDP in the banking sector. The independent experts who were interviewed took an alarming approach to the refinancing rate, arguing that it was too high to lower the loan rates for the sake of supporting entrepreneurship and the sectorial development. On the other hand, the central bank's monetary policy fosters growth in the banking sector by an amount that is almost equal to the negative effect of the refinancing rate. On top of this, experts revealed other factors not captured by the model:

- Lack of access to international financial markets hampers competition in financing sources and limits alternative financing.
- Banks are reluctant to develop: excluding a couple of retail banks and financial institutions, most of them show no drive to create new products or innovations. This is borne out by the lack of competition as well.
- According to a couple of the experts, having government intervention for lowered rates would only benefit the economy as a whole.

4.2.The IT and telecommunications sector

The sector's early development can be credited to the introduction of the internet and the use of Azerbaijan's national top-level domain ".az". The private sector was the main driver in developing the internet in the early years. This required a special license, which was eliminated in 2000 to foster growth in the sector. Nearly 40 internet service providers have been operating in the country since abolishing the license requirement. Three of them are state agencies: Bakinternet, AzDataNet and AzTelecom.

Figure 6 Main macro indicators of ITC sector, in millions of AZN (at current prices)⁴



The trend of value added by the IT and telecommunications sector is upward. In 2005–2008, it increased sharply, but, at the beginning of 2009, a slowing of the growth rate can be observed. Gross and net operating surpluses increased in 2005–2009, followed by a gradual decrease in 2010, and then an upward trend in 2011–2012. Local and fixed capital investments decreased in

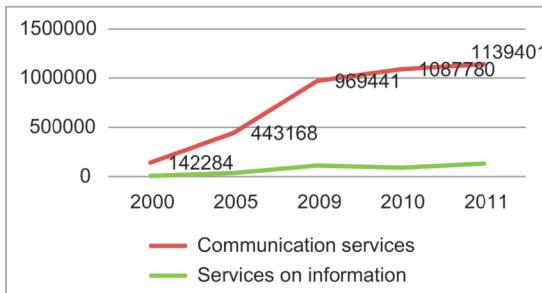
⁴No information about the amount of indicators in 2000 had been found during the investigation.

2009 due to the financial crisis. There is no information about the amount of foreign investments made in 2009 and 2010, but growth was observed and the trend was upward in other years.

The proportion of the population employed in the IT and telecommunications sector remained nearly the same: around 1% between 2005 and 2009 (SSC, 2013). There was a slight increase to 1.29% in 2010, but the percentage of workers remained stable in 2011.

Apart from macroeconomic indicators, we see a significant increase in the volume of IT and telecommunications services since 2000:

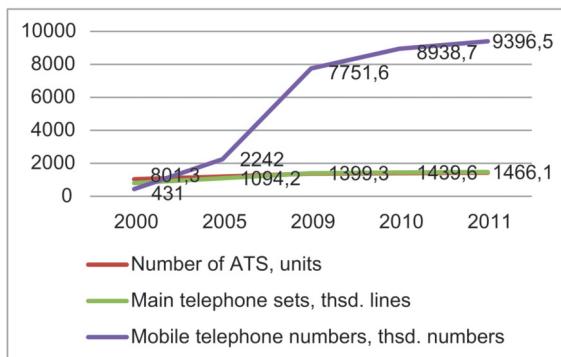
Figure 7 Volume of information and communications services, current prices, in thousands of AZN



Source: The State Statistical Committee of the Republic of Azerbaijan (2013)

The volume of telecommunications services has been increasing since 2000 and, in 2011, the gross amount of services was nearly eight times more than it was in 2000. The volume of IT services had been increasing due to the growing volume of mobile communication services, which is the biggest part of telecommunications services. But in 2010, there was a fall in the total amount of services by nearly 22%. The main reason was the delayed effect of the financial crisis on Azerbaijan's economy. In 2011, the indicator began to rise again, surpassing the 2009.

Figure 8 Telephone communication



Source: The State Statistical Committee of the Republic of Azerbaijan (2013)

The numbers of ATS⁵ and landline telephones have only increased since 2000. Mobile telephone units have increased sharply, as well. In 2000, the total amount was 801,300, which rose to 9,396,500 in 2011 – a more than 11-fold increase. If one considers the population in 2011, which was 9,111,100, it can be calculated that there were 1.04 mobile numbers per person in the country. Put it differently, any given person often uses two or three mobile numbers, one on each operator's network. This is borne by the inefficiency of any single mobile operator for daily purposes.

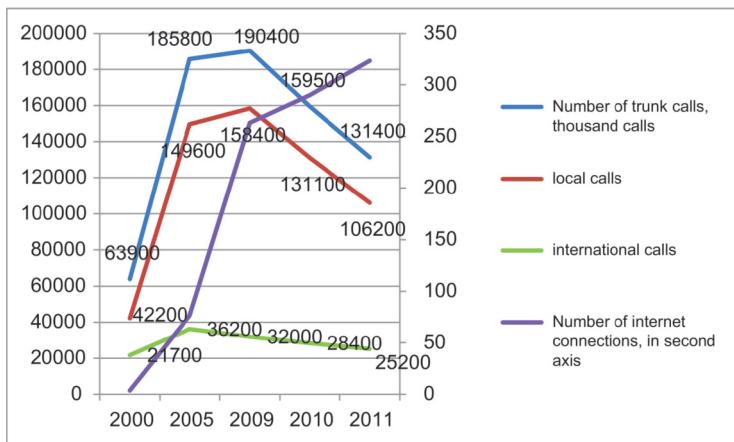
As we see in Figure 9, the amount of trunk calls as well as local and international calls sharply increased in 2000-2005, but starting in 2005, international calls, and local and trunk calls began decreasing sharply. The main reason for this is people using the internet, which is more comfortable and cheaper than telephone calls.

4.2.1. Economic policy in the IT and telecommunications sector

The government's role in the development of the information and communications technology (ICT) sector has been essential. In 2003–2012, the government carried out comprehensive and

⁵Automated Telephone Stations

Figure 9 Telephone communication (continued)



Source: The State Statistical Committee of the Republic of Azerbaijan (2013)

consistent actions in the ICT field. As a result, in many international reports, including the World Economic Forum's *The Global Information Technology Report*, Azerbaijan was listed among the top 10 places in the world in the categories of "The success of ICT in support of the government" and "The importance of ICT in the government's vision of the future". Moreover, Azerbaijan ranked 56th among 144 countries in the same report's network readiness index.

There were three main programs that played a significant role in the development of the sector. The first program was established on 13 February 2007 when the President of Azerbaijan approved the State Program on Establishing Biometric Identification System in the Republic of Azerbaijan. This program was divided into two phases: the first phase (2007–2009) improved the legislative framework in the area, and developed and adopted new normative acts in biometric identification systems, actions to strengthen the government's control of migration processes, and improvements to the formation of information resources on individualiza-

tion of documents for border crossing. The second phase (2010–2012) covered actions to expand and improve biometric technologies (AR State Migration Service, 2013).

The second program was the State Program on Establishment and Development of the Space Industry in the Republic of Azerbaijan, which was ordered by the president of Azerbaijan on 4 November 2008. This program creates and develops the space industry, meets the needs of the state authorities for satellite communications, provides for the growing radio and TV broadcasting needs of the population in the regions, increases the country's international communication channels, and develops economic, social, scientific, cultural and security fields by the effective utilization of outer space. Prospects for the development of this sector will be created by enlarging the international cooperation in the space industry, strengthening the potential of the space industry of the Republic, developing space industry technologies, organizing new communications services, such as radio and TV broadcasting, earth remote sensing, hydrometeorology, meteorology, ecological monitoring, control of emergency situations, space investigations, search and rescue programs, etc. (Presidential Administration, 2013).

The final and main step is the establishment of »e-government«, or an activity implemented by government agencies through the use of modern information technologies to provide information and e-services to all residents of Azerbaijan, legal entities and individuals, as well as foreign citizens and stateless persons. The main objective of the newly established opportunities is to provide services that will decrease the distance between civil servants and citizens, i.e. to simplify these relations and make them transparent. The widespread introduction of electronic services by government agencies, an increase in their number and quality, and the development in citizens' satisfaction with services are means by which the this goal can be achieved. Based on the international experience of arranging a more convenient way of

citizens and state authorities to communicate, e-government is based on the »single window« principle.

Writing the model results, VAR calculated as:

$$\begin{aligned} T_GDP = & C(1,1)*T_GDP(-1) + C(1,2)*INV(-1) + C(1,3) + C(1,4)*GS \\ & + C(1,5)*RR + C(1,6)*T_M3 + C(1,7)*TAXE \end{aligned}$$

$$\begin{aligned} INV = & C(2,1)*T_GDP(-1) + C(2,2)*INV(-1) + C(2,3) + C(2,4)*GS \\ & + C(2,5)*RR + C(2,6)*T_M3 + C(2,7)*TAXE \end{aligned}$$

And if we substitute the coefficients:

$$\begin{aligned} T_GDP = & 0.0212392534919*T_GDP(-1) - \\ & 0.00237810313551*INV(-1) + 0.171359765761 + \\ & 0.0594199608028*GS - 1.68763185692*RR + \\ & 0.967518753273*T_M3 + 0.00567101484743*TAXE \end{aligned}$$

$$\begin{aligned} INV = & -2.27321249319*T_GDP(-1) + 0.842322061348*INV(-1) + \\ & 8.44369836353 - 0.642730050917*GS - 21.4105319445*RR + \\ & 7.48804897191*T_M3 + 5.30429647728*TAXE \end{aligned}$$

The sectorial policy of the government was effective within one quarter, as the 1 lag model resulted in the better model specification. And, according to this model, tax exemptions and government spending in the sector was effective. Tax exemptions to shareholders fostered total investments by 5.30429647728, as per the results of model. They impacted the GDP to a lesser extent. Government spending was beneficial to sector GDP, but not to investments, as government spending contributed by 0.0594199608028 to GDP and -0.642730050917 to investments. Monetary tools affected the sector in various ways as the refinancing rate negatively impacted the GDP and investment in the sector, in contrast to the money supply's positive contribution.

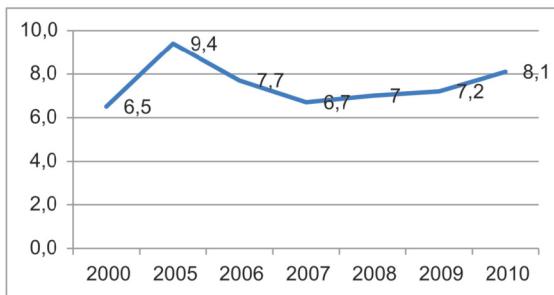
These regression equations are characterized by Akaike information criterion and Schwarz criterion values of 5.206818 and 5.803994 respectively. The F value for the GDP equation and Investments equation were 445.1122 and 56.47136, respectively – large enough to draw conclusions about the significance of the results.

According to experts, the government takes the largest share of the IT sector. Just three of 50 internet service providers (ISPs) are state-owned, yet these account for more than 40% of the sector's GDP. This view is also supported by our model with its positive correlation of government spending with sectorial GDP. Apart from this, experts believe that the current strategy is not enough to foster growth in the sector. In their view, the IT sector needs to shift from services to production. Right now, Azerbaijan's IT GDP is generated only by sales of its services. Experts believe that IT cannot be labor consuming and a sector with diversification potential in only IT services. In order to make the sector productive, labor consuming and GDP contributive sector, IT needs to have its own factories to produce different electric appliances and employ the graduates of local IT universities of Azerbaijan. According to independent experts, Azerbaijan should not strive to compete with developed countries in the satellite sector but rather should concentrate on building cluster infrastructure. In order to achieve this, prominent experts believe that an independent supervisory entity should be established to lessen government influence and maintain enough control. Failure to establish this entity will result in further brain drain and loss of growth opportunities in the sector.

4.3.The construction sector

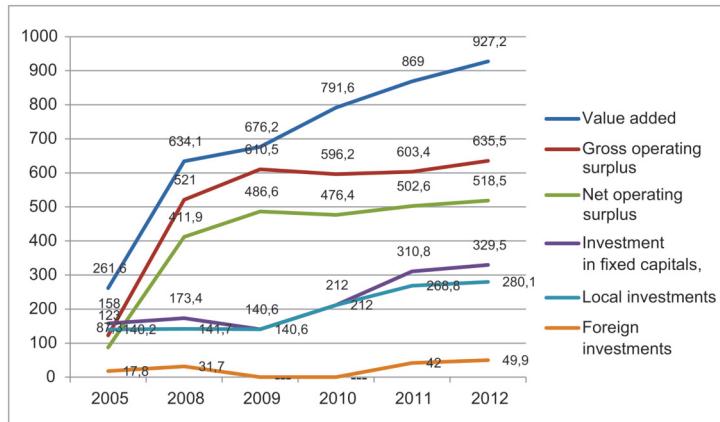
Construction is one of the sectors that has positively affected Azerbaijan's economy. To review the past and current role of the construction sector in the economy, let us look at the statistical data.

As seen in the chart, the maximum amount of value added to the GDP by the construction sector was observed in 2005. After that, its share of GDP began to fall and reached its minimum in 2007. Then it began to increase again and reached new height in 2010. Although there was no decrease between 2007 and 2010, the construction sector was the worst hit by the global economic crisis, facing a sudden lack of customers and capital, which negatively affected the main economic indicators of the sector. Others

Figure 10 Share of sector GDP in percent

Source: The State Statistical Committee of the Republic of Azerbaijan (2013)

sectors of the economy have not suffered as much as the construction sector. As seen in Figure 11, the volume of work performed by construction enterprises had been increasing from 2000 to its peak in 2008, just before suffering from the financial crisis. But in 2010, the sector recovered with increases in both 2010 and 2011.

Figure 11 Selected indicators of the construction sector (current prices, in thousands of AZN)⁶

Source: The State Statistical Committee of the Republic of Azerbaijan (2013)

⁶During the research there was no information about the amount of the necessary indicator in 2012

The volume of investment in construction had been increasing from 2000 to 2008, with the only observed decrease in 2009 due to the overall decrease in economic activity. While in 2008 the investment growth in construction services was 152% compared to the previous year, in 2009 it was only 92%. In 2010 and 2011, however, the upward trend resumed. Investments in fixed capital had also been increasing since 2000 and the decrease had only been observed in 2009. Investments in fixed capital are divided into two parts:

- Construction of objects in production
- Construction of objects in the service sector

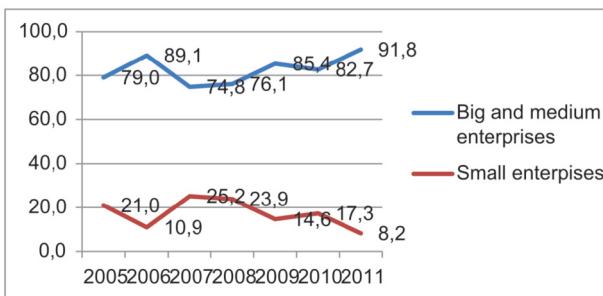
There is no exact information about their amount in 2000, but in 2001 the proportion of investment was as follows: construction of objects in production made up 72.5% and construction of objects in service fields made up 27.5%. Due to the growing production sector, this proportion had been changing in favor of the construction of objects in production until 2004, when this sub-sector reached its maximum of 80.7% and the amount of investment in the construction of objects in service fields was 19.3%. This proportion began to change in favor of the construction of objects in service fields in 2005 when the proportion of construction of objects in production was 73.9% and the construction of objects in service fields 26.1%. As the former began to decrease, in 2011, the proportion of the construction of objects in production was 47.1% and the construction of objects in service fields 52.9%. Year by year, the proportion had changed and now investments in the construction of objects in service is a major sub-sector that draws more and more investments each year.

Moreover, investment in construction and installation can also be divided according to domestic and foreign investments. In 2000, the share of domestic investments was only 47.6% while the share of foreign investments was 52.4%. Then, the amount of foreign investments began to rise and hit its high in 2003: with

foreign investments at 75.2% and domestic investments at 24.8%. But, starting in 2004, the decrease in foreign investments and increase of domestic investments resulted in foreign investments' drop to 21.3% in 2009, or more than three times less than in 2004. In 2010, there was a slight increase in the share of foreign investments (24.3%), but an observed decrease in 2011 made this amount even less than in 2009, so foreign investments' share fell to 20.3% and domestic investments' share to 79.7%.

There are plenty of construction enterprises that serve the population and provide necessary construction. Large, medium and small enterprises operate in both rural and urban areas.

Figure 12 Volume of work carried out by construction enterprises, in percent⁷



Source: The State Statistical Committee of the Republic of Azerbaijan (2013)

Large and medium enterprises dominate this sector, but their growth trend has fluctuated during the observed period. The share of large and medium enterprises increased from 2005 to 2006, and decreased again in 2007. The next increase in the share of large and medium enterprises was observed in 2009; the next decrease in 2010. In 2011, the amount of large and

⁷ During the research, there was no information about the amount of the necessary indicator in 2000 and 2012

medium enterprises reached its maximum: 91.8% of the sector. The opposite process was observed in the small enterprises trend and, accordingly, in 2011, the trend of these enterprises dropped to its minimum: 8.2% of the sector.

4.3.1. Economic policy in the construction sector

The equation of the VAR model for the construction sector is given with following equations:

$$T_GDP = C(1,1)*T_GDP(-4) + C(1,2) + C(1,3)*GS + C(1,4)*RR + C(1,5)*T_M3 + C(1,6)*TAXE$$

$$T_INV = C(1,1)*T_INV(-1) + C(1,2) + C(1,3)*GS + C(1,4)*RR + C(1,5)*T_M3 + C(1,6)*TAXE$$

Equations with substituted coefficients:

$$\begin{aligned} T_GDP = & 0.399865214537*T_GDP(-4) - 0.588690407744 + \\ & 0.000938985782972*GS + 3.30331439662*RR + \\ & 0.232962854969*T_M3 + 0.0518696971713*TAXE \end{aligned}$$

$$\begin{aligned} T_INV = & - 0.00315704976078*T_INV(-1) - 0.633284957722 + \\ & 0.00103569103213*GS + 1.06175495749*RR + \\ & 0.578696222903*T_M3 + 0.0914668529147*TAXE \end{aligned}$$

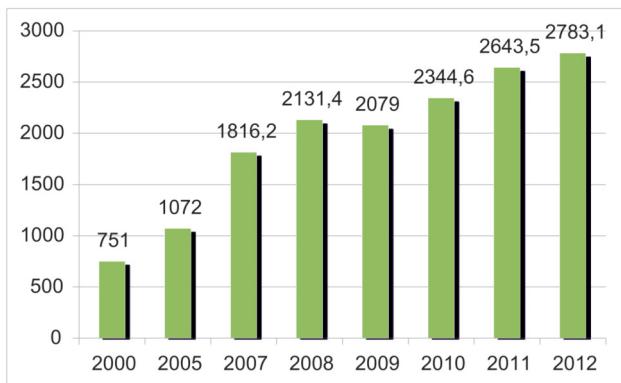
The quality figures for these tests are very robust with high significance implications. R-squared and adjusted R-squared figures for GDP and investment equations are {0.959687 and 0.952968} and {0.948795 and 0.941037}, respectively. The closeness of these figures implies a strong argument against a multicollinearity problem. And these values themselves argue for a strong goodness of fit of the given model. The AIC, SC and F values are {-0.057731; 0.206189; 142.8347} and {0.253052; 0.508984; 122.2945} for the first and second equations. These figures imply a high significance for regression results. The government's tax policy for entrepreneurs and spending in the sector positively affected both investments and GDP in the sector.

The construction sector has very good potential for development. However, the actions to reveal this potential are very weak. Thus, the economy is unable to exploit its full potential in the sector. This problem is reflected in the high import costs of raw materials in the construction sector. In other words, like the IT sector, the construction sector is also based on services that are not labor consuming. The government of Azerbaijan can achieve large-scale employment and industrial growth by facilitating local production of imported materials.

4.4.Agriculture Sector

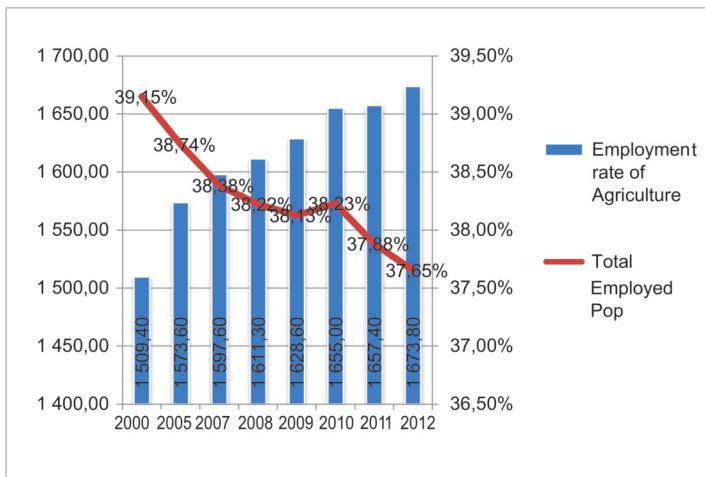
Azerbaijan is one of the world's oldest agricultural centers. Agriculture is still the largest employer, making up 37.65% of the total workforce in Azerbaijan (Aras & Süleymanov, 2010). Agriculture is the main sector in which the state creates initiatives for poverty reduction and socio-economic development programs. According to the State Statistical Committee, Azerbaijan's agriculture sector has developed at a satisfactory pace in the last 12 years. It is regarded as a socially strategic and labor-consuming sector, requiring special attention.

Figure 13 GDP in the agriculture sector in millions of AZN



Source: The State Statistical Committee of the Republic of Azerbaijan (2013)

Figure 14 Employment in agriculture



Source: The State Statistical Committee of the Republic of Azerbaijan (2013)

That is why we can see progress on this chart between 2000 and 2008. In 2009, GDP decreased due to the economic downturn. But from 2010 to 2012, the agricultural GDP gained ground.

The advantage of the agriculture sector is decreasing but is still very important.

In August 2004, the World Bank and the government of Azerbaijan approved the Investments to Agrarian Areas project. According to this program, 78 new bank branches were to be built in agrarian areas. It also affected the employment rate of agriculture sector. As we can see on the chart, after 2005, the employment rate rapidly increased.

According to the Food and Agriculture Organization (FAO) of the UN, Azerbaijan has been much less affected by the global economic crisis than other countries in the region, but inflation is high and adversely affects the poor, with the poverty risk increasing with the size of the household. Income per capita for people living alone is twice as much as that for households with

children. Based on the most recent data available on the prevalence of undernourishment (2006–2008), Azerbaijan is classified by the FAO among countries with a very low level of hunger, i.e., it has less than 5% undernourishment (FAO, 2011).

After 2009, several new state programs were adopted, such as the State Program of Socio-Economic Development of the Regions of Azerbaijan (2009-2013), the State Program of Poverty Reduction and Sustainable Development of the Republic of the Azerbaijan, the State Program of Ensuring Reliable Population in the Republic of Azerbaijan in food provision (2008–2015). (Azerbaijan.az, 2013)

4.4.1. Economic policy in the agriculture sector

VAR model is given with the equations of

$$\begin{aligned} T_GDP = & C(1,1)*T_GDP(-4) + C(1,2)*T_INV(-4) + C(1,3) + \\ & C(1,4)*T_SUBS + C(1,5)*T_M3 + C(1,6)*N_GOVTS + \\ & C(1,7)*N_TAXE + C(1,8)*N_RESR \end{aligned}$$

and

$$\begin{aligned} T_INV = & C(2,1)*T_GDP(-4) + C(2,2)*T_INV(-4) + C(2,3) + \\ & C(2,4)*T_SUBS + C(2,5)*T_M3 + C(2,6)*N_GOVTS + \\ & C(2,7)*N_TAXE + C(2,8)*N_RESR \end{aligned}$$

And if we substitute the coefficients

$$\begin{aligned} T_GDP = & 0.965321123637*T_GDP(-4) - \\ & 0.00387223462725*T_INV(-4) - 0.156674186014 - \\ & 0.0626043800329*T_SUBS + 0.0300216051326*T_M3 + \\ & 0.00157285946848*GS + 0.0636174942792*N_TAXE + \\ & 2.77435214417*RR \end{aligned}$$

$$\begin{aligned} T_INV = & 0.0830678718999*T_GDP(-4) - \\ & 0.221876762856*T_INV(-4) - 0.357048015244 + \\ & 0.670986838448*T_SUBS + 0.325002915455*T_M3 + \\ & 0.00302615882777*GS - 0.123809766012*TAXE + \\ & 1.71852030459*RR \end{aligned}$$

The model specification had an interesting result: the agriculture sector was one of the rare sectors exhibiting long-term sectorial policy implications with a lag value of 4. In other words, the sectorial policy was best reflected in the GDP and investments only after four quarters. These regression equations exhibit quality characteristics of very high F-statistic (174.1878 for GDP and 48.2069 for investments), and very strong AIC and SC figures: -0.146877 for AIC and 0.55691 for SC. R-squared and adjusted R-squared for GDP in the sector were 0.977552 and 0.97194. These figures for investments equation were 0.923382 and 0.904227, respectively.

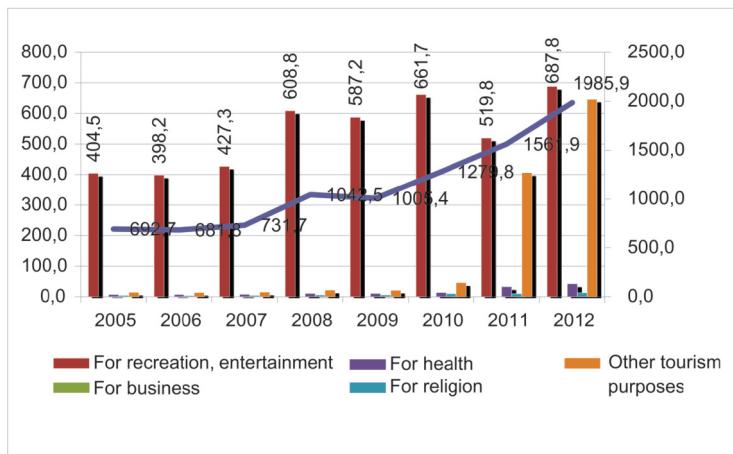
According to the equations, subsidies negatively affected GDP but positively affected investments. In other words, subsidies are not reflected in the GDP figures of the sector. This conclusion is inferred from the negative coefficient of subsidies for GDP (-0.0626043800329) and a positive one for investments (0.670986838448). The government's sectorial tax exemptions and spending positively affected GDP as per the coefficients of these variables.

Experts believed that the profit margin was very low in this sector, which affects everything – including, but not limited to, motivation, competition, and export potential. This problem is exacerbated by a lack of reasonable access to capital and new technology. Illiteracy among farmers affects their export quantity and quality as well. Without an adequate understanding of agricultural products, farmers cultivate and grow items with low export potential. In order to achieve GDP growth in this sector, the government should immediately cut subsidies (which negatively affect sectorial GDP) and increase government investments in the sector with even more tax exemptions provided to farmers. So farm farmers are exempted from paying all taxes but the tax on land. By minimizing trade intermediaries for agricultural exports, the government could ensure that farmers maximize returns from production.

4.5.Tourism sector

Azerbaijan's natural beauty, history, and archaeological artifacts demonstrate the potential for its tourism sector. On top of this, Azerbaijan's good climate – with nine out of 11 climatic zones – has attracted a lot of tourists. Also, the Caspian Sea coasts in Khachmaz and Lenkaran, and Astara's tourism centers, have gained attention from tourists and increased potential for the tourism sector. According to the State Statistical Committee, tourists mostly visit Azerbaijan for recreational purposes, as shown in Figure 15 (State Statistic Commitee, 2013)

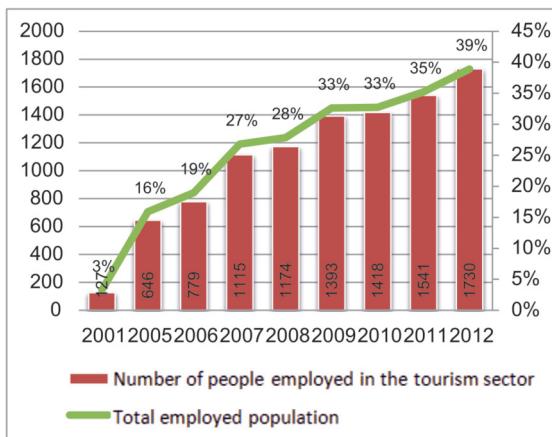
Figure 15 Purposes of tourist visits to Azerbaijan in numbers



Source: State Statistics Committee (2013)

According to the Ministry of Tourism and Culture, this is due to the widespread recreational and entertainment facilities in Azerbaijan. Tourists mostly come from countries in the Commonwealth of Independent States (CIS); European countries make up only a small percentage of tourists. According to the Ministry of Tourism, the number of foreign guests increased to 1 million in 2012. (Tourism, 2013)

Figure 16 Employment rate in tourism sector, in percent



Source: State Statistics Committee (2013)

The adoption of the State Program on the Development of Tourism in the Republic of Azerbaijan for 2002-2005 created favorable conditions for the development of tourism and integrated this sector with the international tourism market. This state program also affected employment in the tourism sector, which increased fivefold between 2001 and 2005, as seen in Figure 16. Also, this state program helped create investment opportunities for Azerbaijan.

4.5.1. Economic policy in the tourism sector

On 27 August 2002, the state program on the Development of Tourism was approved. Moreover, the president approved the reform of the tourism sector, which focused on duty sharing in the tourism sector. As per the results of this reform, the length of the license for tourism activities has been extended from two to five years. The government's tax revenues from the sector decreased to 2.750 million AZN from 8 million AZN. And, thanks to the amendments of the state program, the number of enterprises in the tourism sector increased by 130.

According to the Azerbaijan Export and Investment Promotion Foundation (Azpromo), implementation of state programs in the sector has been investment efficient. The enormous potential of Azerbaijan is another reason for investing in this sector, as it could attract tourists from Iran, Russia and Central Asia. In addition, Azerbaijan is located at geographically favorable location between Europe and Asia.

The effects of this sector are quantified via the VAR model, which is given with following model:

$$T_GDP = C(1,1)*T_GDP(-4) + C(1,2) + C(1,3)*GS + C(1,4)*RR + C(1,5)*T_M3 + C(1,6)*TAXE$$

With coefficients:

$$T_GDP = 0.363536156561*T_GDP(-4) + 0.0157295056967 + 0.00503758131049*GS + 0.00784000322809*RR + 0.667495120229*T_M3 + 0.235843115556*TAXE$$

The government's fiscal policy positively contributed to the development of the sector. The same logic applies to the monetary policy. Among them, the largest implication was from monetary policies, specifically the money supply in the economy with the highest coefficient of 0.667495120229. Despite this, tax exemptions had a huge contribution relative to the government spending and refinancing rate, which is implied from its second largest coefficient of 0.235843115556. Quality characteristics of this equation make it one of the strongest equations in this research: a high F-statistic (330.2914) with low AIC and SC figures (-1.255862 and -0.991942).

One of the experts interviewed about the future prospects of tourism in Azerbaijan emphasized its natural beauty: »We just need good management to benefit from this beauty.« When asked what »good management« meant, the expert interpreted it as establishment of a competitive sector. Generally, experts outlined the following points for the future development of the sector:

- Development of winter tourism

- Local populations spend a substantial amount in neighboring countries' tourism centers because of the price: foreign tourism centers charge less for higher quality service.
- Azerbaijan's visa policy is an obstacle to tourism; liberalized visa rules would support sectorial development.

4.6.The industry sector

The industry sector is one of the most developed areas in Azerbaijan, with its natural and skilled human resources and potential internal demand. The sector has been one of Azerbaijan's more profitable sectors since independence. Azerbaijan signed production-sharing agreements on oil and gas fields with foreign companies on 20 September 1994, which also led to the sector's development. The industry benefited from radical changes between 1995 and 2008. According to Azerbaijan.az (2013), the non-state share of gross production in the sector increased from 5.5% in 1995 to 75% in 2008. The oil sector's dynamic development from 2008 to 2012, which was changed by the oil industry, exceeded the development of all non-oil sectors combined. The figures below are from the State Statistical Committee of Azerbaijan and depict the rapid growth of the industrial sector.

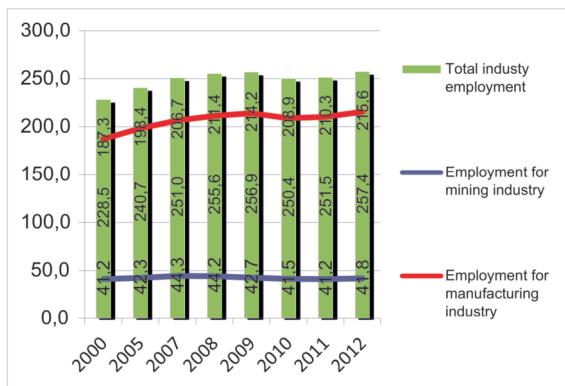
Figure 17 GDP for the industry sector



From 2000 to 2008, Azerbaijan's industrial sector saw serious success. But between 2009 and 2010, the GDP decreased due to the economic downturn. The analysis of the non-oil industry (as provided in Figure 17) shows that, in 2010, the economy enjoyed 6.2% growth in the sector. In 2011, non-oil industry was 5.7 billion manats, an increase of 11.1%. And also, between 2011 and 2012, non-oil industry grew 0.9%.

According to the International Labor Organization (2103), employment in industry has declined sharply, from 23% in 1990 to 9% in 2007. But, as seen in Figure 18, from 2009 to the present, the rate of industry employment increased 0.2% or by a total of 5,000 jobs.

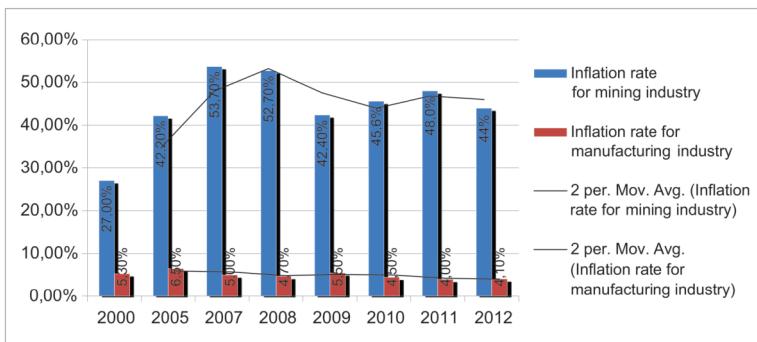
Figure 18 Employment for Industry sector, in whole numbers



Source: State Statistics Committee (2013)

According to the State Statistical Committee (2013), inflation in the industrial sector is reflected in Figure 19.

Figure 19 Inflation rate for the industry sector, in percent

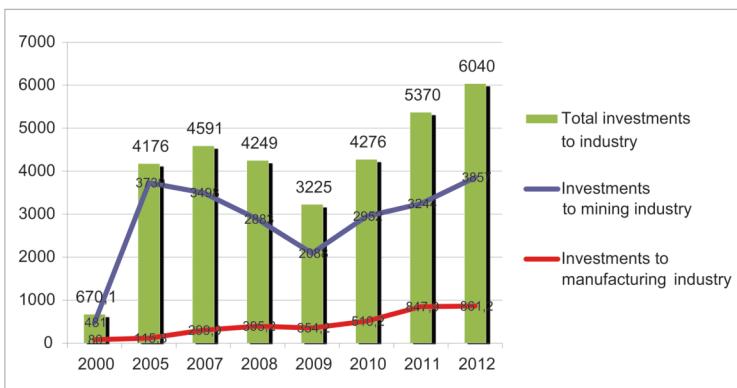


Source: State Statistical Committee of the Republic of Azerbaijan (2013)

As one can see, inflation in this sector was mainly pushed up by the mining industry, as this indicator reflects rapidly changing oil and gas prices. Over the last 12 years, we can see that the peak level of inflation was in 2007. The rate then decreased until 2009, reflecting a drop in the world market. Inflation in the manufacturing sector was almost constant for the last 12 years.

Next, we discuss investment in the sector.

Figure 20 Investments in the industry sector, in millions of AZN



Source: State Statistical Committee of the Republic of Azerbaijan (2013)

The mining industry seems more interesting to businessmen based on the higher investment inflow to the subsector than the manufacturing industry. This interest is related to gas and oil production. But if we just look at the non-oil industry in 2010, we can observe 12.2% growth in investments. According to the Ministry of Economic Development (2012), between 2005 and 2010, the economy saw private investments directed to the non-oil sector as well. From 2010 to 2012, investments increased by 41.2%. In addition to general private investments, private corporate investments are also growing: the sale of Garadagh Cement to Holcim and BP is one of the bright examples.

4.6.1. Economic policy in the industry sector

The VAR model for the sector has been run with two different characteristics: one to assess policy in the energy industry, the second in the production industry. These models are given with the following equations:

Energy industry:

$$\begin{aligned} \text{GDP} = & C(1,1)*\text{GDP}(-1) + C(1,2)*\text{T_INV}(-1) + C(1,3) + C(1,4)*\text{TAXE} \\ & + C(1,5)*\text{RR} + C(1,6)*\text{T_M3} \end{aligned}$$

$$\begin{aligned} \text{T_INV} = & C(2,1)*\text{GDP}(-1) + C(2,2)*\text{T_INV}(-1) + C(2,3) + C(2,4)*\text{TAXE} \\ & + C(2,5)*\text{RR} + C(2,6)*\text{T_M3} \end{aligned}$$

Production industry:

$$\begin{aligned} \text{T_GDP} = & C(1,1)*\text{T_GDP}(-4) + C(1,2)*\text{T_INV}(-4) + C(1,3) + \\ & C(1,4)*\text{GS} + C(1,5)*\text{TAXE} + C(1,6)*\text{RR} + C(1,7)*\text{T_M3} \end{aligned}$$

$$\begin{aligned} \text{T_INV} = & C(2,1)*\text{T_GDP}(-4) + C(2,2)*\text{T_INV}(-4) + C(2,3) + C(2,4)*\text{GS} \\ & + C(2,5)*\text{TAXE} + C(2,6)*\text{RR} + C(2,7)*\text{T_M3} \end{aligned}$$

Energy industry equations with coefficients:

$$\begin{aligned} \text{GDP} = & 0.647336348453*\text{GDP}(-1) - 0.295462113673*\text{T_INV}(-1) + \\ & 0.875703818812 - 0.418163815605*\text{TAXE} + 6.88375614688*\text{RR} \\ & + 0.696947111654*\text{T_M3} \end{aligned}$$

$$\begin{aligned} T_INV = & -0.00249026835331 * GDP(-1) + 0.21179896571 * T_INV(-1) \\ & - 1.05478608361 + 0.893997615246 * TAXE + 10.4926184995 * RR \\ & + 0.601231702883 * T_M3 \end{aligned}$$

Production industry:

$$\begin{aligned} T_GDP = & 0.138349605908 * T_GDP(-4) + \\ & 0.000840335631469 * T_INV(-4) - 1.2271216494 + \\ & 0.504238455642 * GS + 0.117947061606 * TAXE + \\ & 7.66232332211 * RR + 0.0405942142149 * T_M3 \end{aligned}$$

$$\begin{aligned} T_INV = & 0.331625514703 * T_GDP(-4) - 0.545305964281 * T_INV(-4) \\ & - 1.05547291093 + 0.293261980213 * GS + \\ & 0.230496965203 * TAXE + 6.90987203266 * RR + \\ & 0.971094179946 * T_M3 \end{aligned}$$

Tax exemptions negatively affected sectorial GDP in the energy industry, but positively affected investments. As per this equation set, sectorial GDP and investment is best explained with a 1-quarter lag. Or the policy decisions are reflected in sectorial GDP after 1 quarter, as per the model. The monetary policy's effect on the sector was positive. This is supported by the correlation of sectorial GDP (i.e. petrodollar inflow) with the exchange rate and money supply policies of the central bank.

The quality of the figures for the energy industry equation, however, gave some alarming results: R-squared and adj. R-squared figures for the GDP and investments equations were {0.889915 0.873235} and {0.296467 0.189871}. Although figures for GDP show satisfactory results, figures for investment display a multicollinearity problem. Thus, one can rely on GDP figures, but not on the coefficients of the investment equation. On top this, the F-value for investments displays strong insignificance (2.781223). The F-value for the GDP, however, is significant (53.35342). Despite this, AIC and SC figures imply a reliable model specification with values of 4.860982 and 5.372848, respectively.

The GDP of the production industry, as well as investment in the

sector, benefited from all government policies. Excluding the refinancing rate, government spending had the largest contribution to sectorial GDP. Tax exemptions benefited the sector to a lesser extent than government spending. R-squared and adj. R-squared figures for the GDP and investments equation were {0.865499; 0.837671} and {0.971414; 0.9655}. All four figures imply strong significance of the results. This conclusion is backed with F-values of 31.10186 and 164.2468 for GDP and Investment equations. AIC and SC figures are further arguments for strong statistical significance, with -0.016262 and 0.599551, respectively.

Experts believe that industry is the most important sector for development in the economy. However, this sector is presently in a precarious situation: more than 80% of it is oil-dependent. These experts compare the share of oil in industry in 1990 (4.8%) with that of the 2010s. These experts believe this shift transformed the country into an exporter of raw materials. They believe that with the same transport, insurance and other non-production related costs, Azerbaijan can export more finished goods instead of raw materials at a substantially higher profit margin (measured by 4x). According to other experts, shifting from the mere sale of oil to the sale of oil products is beneficial for the following reasons:

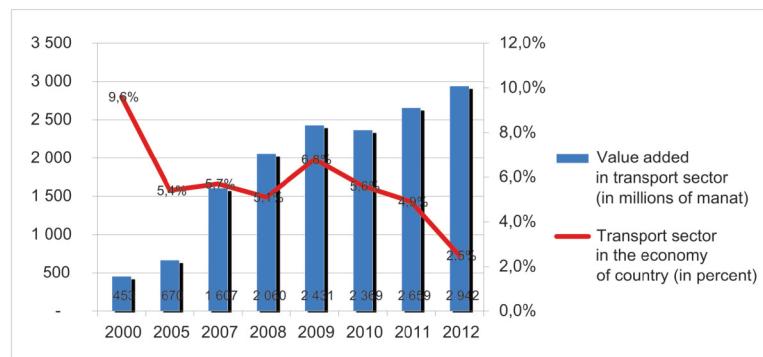
- It is resource-efficient; the rate of depletion of current oil reserves will be decreased
- It is more profitable (by a margin of 4x)
- It will employ more people than the current oil industry

4.7. The transport sector

In recent years, the transport sector had the fastest-growing contribution to national GDP. The transport sector in Azerbaijan includes air traffic, long-haul trucking, waterways and railroads. More than 22,000 km of roads, over 2,000 km of railroads as well as five international and two local airports contribute to this sector's development. These facilities are managed and regulated by the Ministry of Transportation. The Ministry was established on 5 August

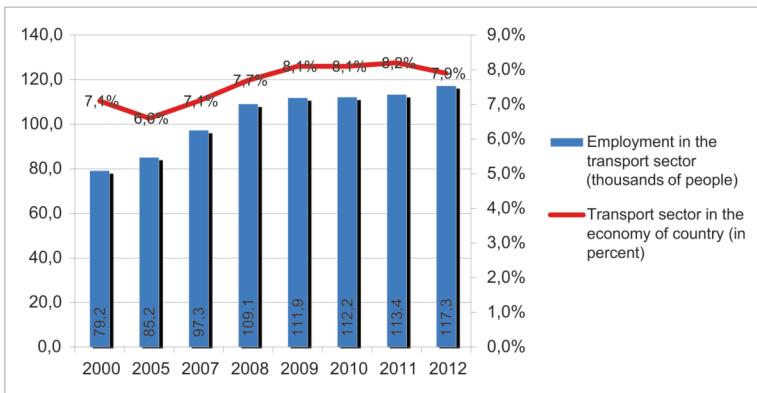
1998 by Presidential Decree No. 743, which divided the sector into the following subsectors: railways, road transport and roads, air transport and airports, and maritime transport and ports. According to the Ministry of Transportation (2013), Azerbaijan is involved in some big international projects, such as TRACECA, to revitalize the ancient Silk Road, the Baku-Tbilisi-Kars railway, etc. Transport routes for gas and oil production and pipelines, such as the Baku–Tbilisi–Ceyhan, are regulated by the Ministry of Transportation as well. At the end of 2009, the Minister of Transportation signed a protocol with the Korean International Cooperation Agency for a feasibility study of the Baku Bay Sea Bridge Project. The planned bridge would connect the Shykh and Zig settlements of Baku. The value added by the transport sector is as follows:

Figure 21 Value added in the transport sector



Source: State Statistical Committee of the Republic of Azerbaijan (2013)

As we observe in Figure 21, the value added by the transport sector increased fivefold from 2000 to 2012. The main reason for this rapid growth was the increase in public and private projects in the sector. These projects increased employment in the sector, too.

Figure 22 Employment in the transport sector

Source: State Statistical Committee of the Republic of Azerbaijan (2013)

As seen in Figure 22, employment in transportation grew by only 0.8% from 2000 to 2012.

With the transportation sector trade turnover indicator, we can analyze Azerbaijan's comparative advantage in this sector. As seen in Figure 23, in the last 12 years, Azerbaijan's trade turnover in the transport sector grew rapidly. In 2009 and 2010, turnover reached its peak level due to gas and oil production.

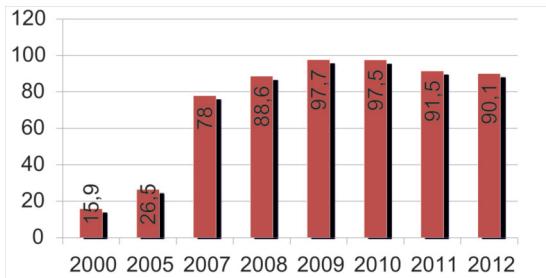
4.7.1. Economic policy in the transport sector

The equation for the transport sector is given by the following model:

$$\begin{aligned} \text{GDP} = & C(1,1)*\text{GDP}(-1) + C(1,2)*\text{T_INV}(-1) + C(1,3) + C(1,4)*\text{TAXE} \\ & + C(1,5)*\text{GS} + C(1,6)*\text{T_M3} + C(1,7)*\text{RR} \end{aligned}$$

$$\begin{aligned} \text{T_INV} = & C(2,1)*\text{GDP}(-1) + C(2,2)*\text{T_INV}(-1) + C(2,3) + C(2,4)*\text{TAXE} \\ & + C(2,5)*\text{GS} + C(2,6)*\text{T_M3} + C(2,7)*\text{RR} \end{aligned}$$

Figure 23 Turnover of goods in Transport sector, billion tones per km



Source: State Statistical Committee of the Republic of Azerbaijan (2013)

And if we substitute the coefficient into the model:

$$\text{GDP} = 0.806597758766 * \text{GDP}(-1) + 6.86390380839 * \text{T_INV}(-1) + 120.715226744 - 36.2457105668 * \text{TAXE} - 1.44292810957 * \text{GS} + 39.03473388 * \text{T_M3} - 16.5904897893 * \text{RR}$$

$$\begin{array}{rcl} \text{T_INV} & = & 0.000992955091305 * \text{GDP}(-1) \\ & & + \\ & 0.257530485078 * \text{T_INV}(-1) & - & 1.1656682823 \\ & & + \\ & 0.762481642943 * \text{TAXE} & + & 0.0352142648769 * \text{GS} \\ & & + \\ & 0.557211585274 * \text{T_M3} & + & 0.667124829002 * \text{RR} \end{array}$$

From the equations, one can infer that quarterly economic policy proved better than others. Investments in the sector benefitted from all of the policies. However, GDP in the sector suffered from both fiscal and monetary policies. On the other hand, goodness of fit figures for the sector implied robust results. R-squared and adj. R-squared figures are {0.979244; 0.975352} and {0.90726; 0.889873} for GDP and investment equations, respectively. However, AIC and SC values tell a different story than R-squared values: AIC (10.78806) and SC (11.38523) are high enough to conclude statistical insignificance of the coefficients for the GDP equation.

Integrating experts' opinions with the results of the model, one

can infer that projects and policies in the sector have contributed to the sectorial GDP. Experts believe that the currently undertaken projects, such as the Baku–Tbilisi–Kars railway, the Baku–Alat Seaport and the TransCaspian routes, will increase GDP. On top of this, there were ideas to cut subsidies to public transport, but not with a cost to customers. These experts promoted establishing an adequate number of public transport companies to increase efficiency and reduce cost and thus dependence on subsidies. Summing up the views of experts, we note the following points:

- This is one of the sectors with unrevealed potential
- Once completed, current projects will help the sector grow
- To foster even more growth, the shadow sector should be eliminated
- Modernization of the sector occurs at a slow pace

5. Conclusion and recommendations

This paper studies Azerbaijan's economic diversification and assesses sectorial fiscal and monetary policies from the perspective of GDP creation and investment attraction. For this purpose, the researchers interviewed and compiled the views of independent experts and government representatives, who are the only source of information regarding the government's current and future sectorial policies. To check these views against quantitative results, the researchers employed three quantitative measures, namely: the Herfindahl-Hirschman Index to measure labor diversification, the Ogive index to measure GDP diversification, and the VAR model to test sectorial fiscal and monetary policies. Data for these models were taken from the State Statistical Committee as well as independent experts and different ministries.

As these methods showed, Azerbaijan's economy is neither a labor-diversified nor a GDP-diversified economy. The HHI and Ogive indices jumped when the agricultural and social services sectors (in labor diversification) and the energy industry (for GDP diversification) were introduced into the models. And the higher the index is, the less diversified the economy.

The most notable results of the VAR model were:

- Subsidies are destroying the GDP in the agriculture sector. Either their distribution scheme should be changed to reflect farmers' productivity or they should be cut entirely. The model argues that the current method of distributing subsidies based on the area of cultivation is not the best method to create GDP in the sector.
- The banking sector largely benefitted from the money supply in the economy. However, the refinancing rate destroyed GDP in the sector. This yields one conclusion: the higher the interest rates, the more it harms the GDP. Thus, rates should be lowered.
- The IT and construction sectors are dependent on the government's fiscal policy: the government's spending and tax exemptions added to GDP in both sectors .
- The production industry's contribution to the GDP, not to

mention sectorial investment, benefitted from all of the government's policies; however, the energy industry was hurt by the government's tax policy.

- The transport sector was also one of the sectors that largely benefitted from all of the government's sectorial policies.

The implications of the models are very close to those of the experts who were interviewed. Their sectorial recommendations could be summarized as follows:

Banking

- Lack of competition among banks impedes development in the sector.
- The limited number of services offered by banks restricts income sources, which are driven almost only by interest income.
- Loan interest rates are high. As a result, funding in the economy shrinks, incentives for innovation decrease, cash flow constraints become a regular problem, and profitability goes down.
- Banks have no presence in the international financial markets, which prevents them from cheaper access to capital.
- Participation of banks with foreign capital constitutes a minor part of the sector. Involving outstanding international banks in the sector would foster a competitive environment, enhancing the range of services and foreign investment flow.

IT and communication

- The sector has developed by focusing on meeting internal demand. Although recently satellite service has been added to the sector, focusing only on internal demands impedes further development.
- The government's share is large. As a result, it creates a monopoly and, hence, an unfair market environment, and the private sector lags behind.
- The sector suffers from the lack of a skilled workforce. Although new training and education programs have been organized, there is still a strong need for a qualified workforce. The quality of the local education system in this field is also questionable.
- Actions taken to improve the sector are not enough. In fact,

the sector's production ability has not formed. Service activities are still the priority.

- In general, intersectional coordination and development trends are weak. Workforce training, using this workforce in production sphere and exporting options are limited.

Construction

- The construction sector is focuses mainly on internal demand and its demand only derives from internal needs.
- Monopolistic tendencies in the sector are high, which results in a less competitive environment and price bubbles, which hamper the growth of mid-sized enterprises, and creates non-transparent turnover.
- Companies in the sector are more service-specialized. There is almost no production, except stone quarries and concrete plants. Most raw construction materials are imported from Russia, Turkey, Ukraine, Spain, Italy and China.
- Prices in real estate markets do not reflect the true purchasing power of consumers, and this decreases development in the sector. As a consequence, although there is enough room for development, the situation in the real estate market is far from revealing this potential.
- A passive mortgage loan policy impedes growth in the construction sector.
- The sector is dependent on government investment.

Agriculture

- Profitability is low; suppliers try to buy products for cheaper prices and it results in less return for farmers and decreased innovation.
- Productivity is low, which also negatively affects profitability.
- Scarce financial funds limit production potential.
- Quality of land resources decreases year by year due to lack of care and the saline content in the soil increases.
- No specialized or scientific approaches are used during the production process. Because traditional methods are more commonly used in farming and cattle breeding, general productivity does not meet modern standards.

- Farmers have limited market access, so products are often sold to intermediaries at less than fair market value.
- Export capability is so weak that it decreases incentives to produce goods with competitive advantages.
- Quality is low, which negatively impacts export potential and competitiveness.

Tourism

- The country's tourism potential is not fully realized. For example, winter tourism is underdeveloped, so citizens tend to go abroad for winter vacation.
- There is a narrow range of choices in the tourism sector, so people who prefer a diverse array of choices go abroad for tourism.
- The quality of service is so low that foreign tourists cannot be turned into repeat customers.
- There are problems with visa issues. Even with nearby countries, such as Turkey and Iran, there is no visa-free regime. In general, bureaucratic barriers and inefficiency of organizations within the sector restrict ease of travel to and within the country.

Transportation

- Although the country's geographic location is advantageous for developing the transportation sector, conditions in this sphere are not satisfactory. Corruption and high tariffs imposed in the customs system diminish the country's transit potential, for example, by depressing the volume of shipping.
- In spite of substantial investment, the process of meeting international standards for transport infrastructure and designing modern transport systems has not been completed. As a result, multiple projects with the same purpose are funded over and over again, constituting a major part of budget expenditures and yet producing limited progress.

Industry

- The sector's dependence on oil has increased. While the share of oil in the mining industry was 4.8% in 1990s, it is now 80%.

- The country became a raw material producer and exporter, especially in the oil sector.
- The lack of final product exports is an inefficient use of resources. Oil reserves have started to decline and, after a short time, income from oil will decrease and the oil fund will come to an end.

5.1. Recommendations for diversification

Having discussed sectorial development potentials and problems, the CESD proposes the following recommendations to achieve economic diversification:

- To establish competition in all sectors. Lack of competition decreases motivation for development, competition and innovation in the economic sector. Competition in the private sector is the only way of revealing true potential for all sectors in Azerbaijan
- To decrease the government's participation in the economy, which should only be regulated for social security purposes. The rest should rely on the private sector
- To immediately suspend subsidies, as they are destroying value in agriculture sector
- To eliminate trade intermediaries in the agriculture sector or the achievement of fair treatment of farmers by these intermediaries
- To lower financing costs, which are sky-high in comparison with developed countries. On average, more than 20–25% of profit margins are decreased due to higher financing costs; High financing costs decreasing tax payments, as well
- To increase the presence of foreign financial capital, which can only help sectorial development
- To develop the IT industry and establish IT clusters
- To concentrate less on satellite competition with developed economies
- To concentrate more on preventing possible IT brain drain
- To establish the production of imported raw materials used during construction
- To establish winter tourism facilities

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**Friedrich-Ebert-Stiftung Regional
Office for the South Caucasus**

Appt. 7, Nino Ramishvili Street 4
0179 Tbilisi
Tel: (+ 99532) 225 07 28, 291 26 15
 (+ 99532) 291 26 95
Fax: (+ 99532) 222 67 27
E-mail: stiftung@fesgeo.org.ge
<http://www.fes.ge>

**Center for Economic
and Social Development**

115, Dilara Aliyeva str.
Baku, Azerbaijan
Tel: (+99412) 497 56 84
 (+99412) 597 06 91
Fax: (+99412) 497 56 84
E-mail: info@cesd.az
<http://www.cesd.az>