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DOCTORAL SCHOOL OF MANAGEMENT AND BUSINESS ADMINISTRATION

Thesis of the Doctoral (Ph.D.) DISSERTATION

THE STUDY OF THE DUTCH DISEASE IN AZERBAIJAN AND THE RESOURCE DEPENDENT ECONOMIES

(INPUT-OUTPUT ANALYSIS, LINEAR PROGRAMMING AND TIME SERIES ECONOMETRICS)

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1. INTRODUCTION- CURING THE DUTCH DISEASE IN AZERBAIJAN

The Azerbaijan economy was one of the transition economies from socialist system to the market economy after the collapse of Soviet Union. In the first place, as the most of the post-Soviet Union member countries, the economy experienced many challenges. However, the existence of the vast natural resources, has been the main fostering factor in the economic development of Azerbaijan. On the other side, the concentration on the resource sector, created the basis to think about the threads and negative results of the dependent economy. In this context, there have been need to analyse and investigate the distribution of the goods and services in the whole sectors of the economy. That is why, the applying of the Input-Output framework to the Azerbaijan economy holds crucial importance in order to diversify the economy.

In spite of the importance of the input-output approach, there have been limited researches by the scholars on the Azerbaijan economy in this direction. The main common limitation of these studies has been the access to the official annual data.

The Azerbaijan economy has common characteristics with the resource dependent countries. Particularly, the recent falls in the world oil prices have challenged the whole economic sectors in Azerbaijan. The current diagnosis of the Azerbaijan economy is not only interesting for scholars, but also all of the citizens in Azerbaijan due to the existing negative impact on their daily live. The literature on the Azerbaijan economy helps to understand the main issues which are related in the current economic results in the country.

1.1. The key problems

The recent development trends in the Azerbaijan economy has directed the author to study the possible signs of the **Dutch Diseases** in Azerbaijan. The Dutch disease is accounted as opposite effects on Dutch production caused by founded the natural gas resources, with resulting the appreciation of the real exchange rate[1].

Logically, analyzing the existence of the mono-economy's (oil-gas-resource dependent economy) characteristics in the Azerbaijan economy can be highlighted as the key study issue and directions in this research. Apart from that, the inter-sectorial relations between oil-gas and the rest of economic sectors in Azerbaijan can be considered as the key study direction via analyzing the input-output approach.

1.2. Importance of the study

In addition to the existing studies on the Azerbaijan economy via applying input-output approach, starting from the literature dive in the Dutch Disease can lead us to the crucial results to understand the key important challenges.

Importantly, testing the varied econometric tools helps to ensure to assess the impact of the "infectious" oil sector in the entire Azerbaijan economy.

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[1] Corden, W.M., 1984. Booming sector and Dutch disease economics: survey and Consolidation, *Oxford Economic Papers*, *36*(3): 359-380

Last, but not least, this research contributes to the current studies via comparative analysis between Azerbaijan and OPEC-the selected countries' economies.

1.3. Hypothesis Development

The understanding the structure and finding the development concentration of the Azerbaijan economy are key critical research directions for the author. As earlier mentioned by the scholars that the probably the resource sector: oil-gas has key role in the Azerbaijan economy. Apart from the literature review, definitely, the official figures are the key means to understand the Azerbaijan economy.

If we divide the Azerbaijan economy to two subgroups as oil-gas sector (includes all resource related activities) and non-oil-gas sector (the rest of the economy), we can see clear imbalance even from the official number without putting additional research efforts. In such case, the author tries to validate potential root causes for the issues in the recent economic structure and assess possible development opportunities in Azerbaijan.

In the early research activities, the author has deepen their knowledge via studying varied issues in the resource dependent Azerbaijan economy: the volatility in the oil prices and decision making process in the governance (Huseynov, 2016, a); the non-oil-gas sector (Huseynov, 2016, b); the impacted social economic policies by the oil-gas sector revenue (Huseynov, 2017, a); the participation rates of the oil-gas (mining) and non-oil-gas sectors (manufacturing) in the total economic output (Huseynov, 2017, b); the oil-gas rents "infection" in the public spending (Huseynov, 2017, c); the public spending and the economic growth (Huseynov, 2017, d); the banking sector and the volatilities and uncertainties (Huseynov, 2018); the nearest future in terms of the lower oil prices by 2025 (Huseynov, 2019).

Getting inspiration from those studies the author has been keen on looking forward to the future economic challenges of the Azerbaijan economy.

In this direction the author has the following hypotheses:

H1-The Azerbaijan economic structure has more common characteristics with the resource dependent economies and the number of the sectors being in the standard range (13 selected countries) has more share in the whole economy of Azerbaijan.
H2- The oil-gas sector has weaker relation with the entire economy than the selected countries' average level.
H3-The Azerbaijan economic sector in general, consumes smaller part of output from GDP, and require smaller inputs in order to produce total output.
H4-The Azerbaijan economy heavily depends on the import in matter of the non-oil sector related inputs.
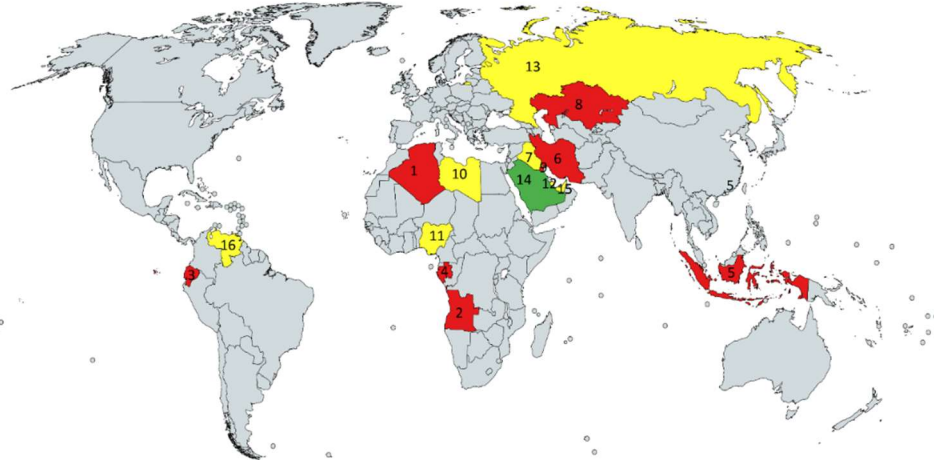*H5-The manufacturing sector is far from the optimal level which is needed by the local economy.*
H6-If we dive into the statistics, data analysis of the economic experiences by Norway and Nigeria, we will realize that, the Azerbaijan economy has more common feature with Nigeria in comparison with Norway.
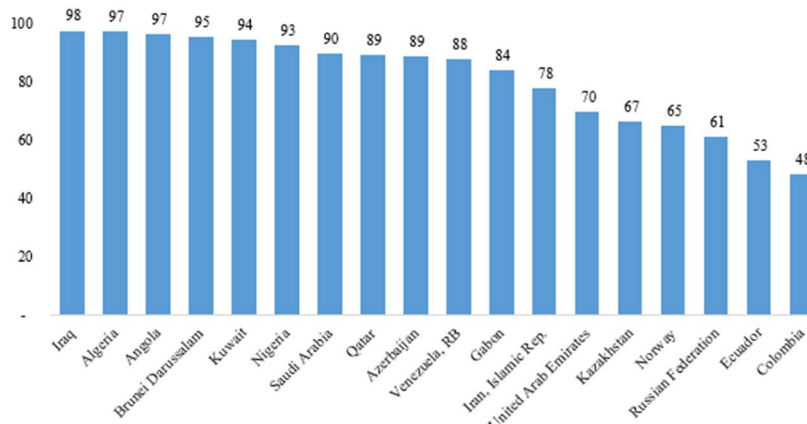
1.4. Curing of the Dutch Disease in the World

In the recent economic developments in the resource dependent economies have showed some general and specific features of this Disease (Map 1, Table 1). On these grounds, it would be better to investigate the countries which had the same problem. That is why, OPEC (Organization of the Petroleum Exporting Countries) should be considered as a first.

Map 1. The world Countries with the "Dutch disease" experience

Source. The Author's own edition, based on in-depth analysis of literature

Before diving to the historical milestones of the selected countries, Graph 1 can lead us the general idea about the similarities and varieties in terms of the key economic indicators. Graph 1 shows that as the traditional sector agriculture has potential in Nigeria with producing one third of the total output in the economy. The lowest numbers are visible in the Arabic countries.

**Graph 1. Fuel exports (% of merchandise exports),
average for the period between 2000 and 2013.**

Source: The World Bank, http://data.worldbank.org/indicator (last accessed: 05.05.2020)

Graph 1 reveals the central factor and reason of the key challenges of the resource dependent economies. Not surprisingly, Azerbaijan is in the highest cluster of the countries where the energy products are dominant in the entire export portfolio of an economy with more than 80% of the share. This visualization makes easier to the readers to understand the key criteria in the selection process of the countries by the author.

Table 1. The world countries with the "Dutch disease" experience

No	Country Name	Year (Realization of the problem)	Concepts for Therapy	Practical Steps and Actions	Outcomes
1	Algeria	1974	Diversify the economy, enhance the share of manufacturing and agricultural sectors in GDP.	Forced industrialization policy, transition from socialism to free market economy, currency devaluation, establishing of Stabilization Fund in 2000	Oil-gas export is dominant in the export, less share of manufacture sector, there are problems in economic institutions
2	Angola	1974	Protect the export of agricultural goods, including, coffee and others, stabilize the inflation, real exchange rate, promote capital investments, and ensure transparency.	Oil revenue spent on huge military expenditure, public consumption, not for private consumption, new monetary policy applied with purchasing the local currency stabilize the exchange rate, ensured depreciation of Kwanza	The share oil export has been more than 95% in total export, inflation has been high, less transparence and corruption in the spending of the oil revenue, the level of public consumption level has been more than private consumption.
3	Ecuador	1973	To diversify the export, to protect traditional agricultural goods in the foreign trade.	The government changed the currency to the US dollar, increased the social spending.	The economy still depend on the oil and agricultural products export, however, Ecuador could achieved to prevent "Dutch Disease" problem.
4	Gabon	1975	To protect the agriculture and manufacture sectors, stabilize the real exchange rates, reduce poverty level and increase social expenditure.	The government joined to the Economic and Monetary Community of Central Africa with accepting CFA Franc as a main currency, the government created Sovereign Fund, the main investment directions have been the sectors related to the oil industry.	The share of the oil products has been more than 80% of the total export, the share of agricultural and manufactural products has been less than 10% of the GDP, inefficient governance, corruption, less transparent business climate and higher poverty level are the main challenges.
5	Indonesia	1978	To manage oil revenues efficiently, to protect traditional agricultural exports, to boost manufactural production, attract FDI, and stabilize the real exchange rate.	The State Oil Company: Pertamina diversified the oil revenue to the non-oil sectors: including industry, real estate, tourism, construction. The Indonesian government applied to strict limitations on the foreign borrowing and changed the monetary policy with the depreciation of the currency in order to promote non-oil exports and enhance the country's competitiveness.	The country achieved more diversified economy, with strong development in manufacture sector, joined to the G-20 countries, all in all, the Country prevented the "Dutch Disease".
6	Iran	1974	Ensure the export diversification, minimize the dependence of the state budget from the oil-gas export, promote the improvement of private sector, to save and invest the resource revenue	The government has created National Development Fund in order to manage the resource revenue efficiently, has denominated the Iranian currency Rial, Accepted New Economic Development Plan, reestablished the economic relations with western countries after sanctions,	Oil-gas export still is amounted half of the state budget revenue, only 30% of the resource revenue can be saved, the purchase power of the currency has been less, the share of the agricultural products in GDP has decreased dramatically in the last decades, the economic

					growth has been more volatile to any changes in the world prices of oil-gas products.
7	Iraq	1979	The first challenge was to minimize the military expenditure during the wars, to prevent the negative effects of the sanctions, to manage oil revenues properly to foster the economic development	The government had to spend the main part of oil-gas revenue to the military expenditure, due to sanctions, the government spent huge revenue on the subsidies.	It is difficult to summarize the economic results due to political instability in the last decades, however, if we do not take those factors into consideration, the whole economy has been depend on the oil-gas export.
8	Kazakhstan	2000	To stabilize the monetary policy, to ensure export diversification, to enhance the development traditional sectors, including agriculture.	The Central Bank has devaluated the national currency, created the reserve fund.	The share of the non-resource sector has been so weak, due to the energy concentration, the economy has been volatile to the world prices.
9	Kuwait	1970	The challenge has been the management issue of huge oil-gas revenue for the small economy and ensure stable exchange rate of the currency.	The Central Bank applied fixed exchange rate regime, established several institutions and funds in order to reinvest, save and diversify any risks, to ensure the sustainable development of the nation's wealth.	In fact, the agriculture and manufacture sector has been so weak. On the contrary, the national currency has been experienced the depreciation. The revenue from oil-gas sector plays important role in the whole economy.
10	Libya	1970	To diversify the export and minimize the dependence from the oil-gas export, enhance the country's competitiveness.	Starting from 2000s new exchange rate regime have been applied in order to improve banking system, prevent black market, promote non-oil export, Sovereign fund has been established in order to manage and reinvest oil revenue.	The percentage oil-gas products has been more than 90% of the total export, the shares of the agriculture and manufacture sectors have been weak in GDP, the most of the assets of the Fund have been invested in the abroad, the revolution, sanctions, civil war, regime changes have been other key factors to affect the economic development.
11	Nigeria	1974	To manage and reinvest the resource revenue to the country's economic development, to protect the manufacturing sector.	The Government established Nigeria Sovereign Investment Authority including 3 different Funds: Future Generations Fund (40% of the assets), Nigeria Infrastructure Fund (40% of the assets) and Stabilisation Fund (20% of the assets). The national currency has been depreciated.	The share of the fuel exports has been between 80-100% in the total merchandise export and the oil rent in GDP has been between 20-40% since 1970s, the lack of efficient institutional management and transparency, the whole economy suffers from the current economic situation.
12	Qatar	1974	How to manage oil-gas revenue, and stabilize the exchange rate of the national currency.	The Central bank has been adopted the fixed exchange rate regime, the Government established the Sovereign Fund.	Due to the efficient revenue management and the sustainable transfers from the Fund to the economy, Qatari economy has not experienced the more challenges, However, in facts, the dependence on the export revenue of the oil-gas products have been higher in the last decades.

13	Russia	2000	To ensure export diversification and minimize the dependence from the oil-gas export, enhance the country's competitiveness	The Russian ruble has been depreciated starting from 2013. The Russian government has established the investment institutions in order to support pension system, fiscal policy.	The falling oil prices (fuel export reached to 70% of the total), international political issues, the economic sanctions are the main challenges for the economy. The share of the manufacturing sector has decreased due to the deindustrialization
14	Saudi Arabia	1974	To manage oil revenues efficiently, to promote economic and infrastructural development, development, and stabilize the real exchange rate.	The government has established Saudi Arabian Monetary Agency as both Central bank and the investments, Several State Programs were adopted, the fixed exchange has been applied since 1980s	The share of the fuel exports has been between 80-100% in the total merchandise export and the oil rent in GDP has been between 20-80% since 1970s, the mobilization of the local labor forces has been very slow, foreigners are the majority in the labor market, and religious tourism has been growing.
15	United Arab Emirates	1974	To manage and reinvest the resource revenue to the country's economic development, to protect the manufacturing sector.	The government has established Abu Dhabi Investment Authority as the Sovereign Fund and the fixed exchange has been applied since 1980.	The UAE economy has been more diversified in comparison with other resource economies, the Government could achieved to attract FDIs and create the international trade center within the country.
16	Venezuela	1974	To ensure the export diversification with protecting traditional export goods, to enhance the sustainable economic development.	The government adopted floating exchange rate regime, applied limitations to the foreign participants in the economy	The economy experiences the worst case in the history, the exchange rate of the currency in the black market is the several times more than official figures, the inflation is higher, the local production cannot operate.
17	Azerbaijan	2015 February	To ensure the efficient monetary Policy and sustainable balance of payments	1st devaluation of the national currency due to the economic issues in the neighborhood countries	Those actions could not meet the Central Banks expectations and it created the basis for the second intervention
		2015 December	To stabilize the monetary policy due to the falling oil prices	2nd devaluation of the currency and move to the floating exchange rate regime	The national currency still can not "float" independently, the Central Bank needs to intervene frequently
		2016	To stabilize the volume foreign currencies in the turnover	The independent exchange offices have been closed	It caused limitations for the "financial market" which never could able organized efficiently
		2015-2016	To stabilize the banking system in Azerbaijan	About 10 commercial banks' licenses were withdrawn by the Central Bank	Those actions could not meet the Central Banks expectations and could not solve the issue of the overdue loans
		2016	To ensure the sustainable financial sector and market	Foundation of the Chamber of Control on Financial Markets Public Entity	As today there is no any real financial market environment
		2016	To mitigate the resource dependency of the economy	The road map had been accepted.	Most of the accepted targets stayed on the paper with no crucial changes over the economy.

Source: The author's own summarizing

1.5. Gap to be studied for the Azerbaijan Economy

In this study the author aims to draw general structure of the Azerbaijan economy via input-output approach, to find the optimum output level for the economic sectors in the Azerbaijan economy, to learn from the world economies which have passed the same milestones, to identify the roots causes and challenges in the Azerbaijan economy, to develop recommendations for the further studies and policy implications for Azerbaijan.

This study is one of the limited researches done by the scholars on the Azerbaijan economy. The key element of the making this research to be different, are covering theoretical and practical tools. Starting with the theoretical knowledge on the resource dependent economies and identifying common aspects over the Azerbaijan economy create the base for the study. Applying global comparative analysis of the input-output and linear programming between Azerbaijan and the selected countries makes this study the contributive to the recent relevant literature.

2. METHODOLOGY AND DATA

2.1. Expert interviews

The author assess the open research questions via offline interviews with the scholars who are experts in the world resource dependent economies. Seemingly, the number of questions helps to cover the major common debates in the selected countries. **Interestingly, the most of the respondents' research works are studied in the literature section. Due to consolidated approach in terms of the summarizing of the responses, the each scholars' ideas are not mentioned individually.**

The main goal by the author taking the interviews was not only to understand common issues in the resource dependent economies, but also try to get attempt to understand the economic experiences of the selected countries via hearing directly from the relevant scholars to support the literature dive. Apart from that, the given answers by the respondents show close mutual understanding with the relevant official statistical numbers.

Apart from that, the author has arranged public interviews with leading economic experts, scholars from public organizations, independent institutes and universities. The key raised questions were about the recent reform initiatives by the government in Azerbaijan.

2.2. Construction and Re-Construction of I/O Tables

The author has taken Input Output data from OECD database as 2011 for 13 selected countries (5 of them are OECD member states) where there is at least one dominant product in their export with holding more than 1/3 share of the total exports[2]. Unfortunately, the author could not able to get the relevant Input-Output tables for the rest resource dependent economies (particularly other OPEC member countries) that noted in the literature due to the lack of the official statistics and no satisfactory return to the quarries of the author by the official offices.

After selecting the countries, the author has extracted the available Leontief inverse matrixes as 2011. The recent years are so available from the OECD database. However, the same information

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[2]Leontief, W., 1986. Input-output economics. New York: Oxford University Press.

was available for only 2011 by the official statistic office of Azerbaijan. That is why, from the timing perspective taking the same year's data into consideration would be more accurate.

As a sample, in order to find the consolidated coefficient (agriculture, forestry and fishing) of the inverse matrix for Azerbaijan, the author has used the formula below.

$$n_{11} = (Sum\ (b_{11}, b_{12}, b_{13}, b_{21}, b_{22}, b_{23}, b_{31}, b_{32}, b_{33})*2)/\ Sum\ of\ numbers\ of\ columns\ and\ rows\ (C\ matrix)$$

Finally the author checks whether the inverse matrix coefficients (n) for Azerbaijan is in the range of the standard deviation of the selected countries.

So, if the coefficient (n) of the consolidated inverse matrix based on the Azerbaijan input output table was in the range noted as true (T) and false (F) vice versa. Apart from that, the author has compared the coefficient (n) of the consolidated inverse matrix based on the Azerbaijan input output table with the mean of the coefficients (m) of Leontief inverse matrixes (B matrix), selected countries, in which percentage n is greater or smaller than m.

2.3. Linear Programming – Optimization

First of all, the author had to calculate the coefficients of the inverse matrix based on the input output table for the Azerbaijan Economy[3]. For this purpose the author has calculated the coefficients for all 81 sectors:

As noted above, the author defines three main goals as below:

1. output maximization
2. workplace maximization
3. export diversification

As an example, we can see the linear programming model for the first sector (S1) of the Azerbaijan economy in the below formula which has been solved in the same way for all 81 sector via applying Lindo 6.1 software[4].

$$Max\ (o_1)\ n_{11}*x_1+\ldots+n_{n1}\ x_n+\ldots+\ n_{s11}*x_{s1}$$
$$ST\ n_{11}*x_1+\ldots+n_{1n}\ x_n+\ldots+\ n_{1s1}*x_{s1} <= c_1$$
$$\ldots$$
$$n_{n1}*x_1+\ldots+n_{nn}\ x_n+\ldots+\ n_{ns1}*x_{s1} <= c_n$$
$$\ldots$$
$$n_{s11}*x_1+\ldots+n_{s1n}\ x_n+\ldots+\ n_{s1s1}*x_{s1} <= c_{s1}$$
$$x_1\ldots x_n\ldots x_{s1} >= 0$$

After finding the optimum-maximum output (m_n) per each sector, the author could calculate the relevant optimum level of labor force.

Employment Multiplier (thousands, number of employees) = total Optimum Output Value per sector (thousands of manat) / Compensation of employees (thousands of manat)

As the last goal, the author has calculated the trade balance and divided to the total output per each sector. With this approach the author can identify the relation between the export-import and the local production, the possibility to diversify the export level per the sector.

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[3] Sousa, T., 2016. Energy Analysis: Input-Output. *Instituto Superior Tecnico*, https://fenix.tecnico.ulisboa.pt/downloadFile/848204501355053/Lecture%2005.pptx

[4] Lewis, C., 2008. Linear Programming: Theory and Applications, https://www.whitman.edu/Documents/Academics/Mathematics/lewis.pdf

2.4. Data Collection and Analysis

The author has taken Input Output data from OECD database as 2011 for 13 selected countries (5 of them are OECD member states) where there is at least one dominant product in their export with holding more than 1/3 share of the total exports.

The author has started by reviewing the relevant literatures on the selected countries. As the results of the outlook on the studies, the relevance of the selected countries per Azerbaijan have been assessed. To find the direction of the Azerbaijan economy, the relevant data analysis has been conducted. Comparatively, the main economic indicators and their relationship have been analyzed via correlations[5].

2.5. International comparative analysis: The way between Norway and Nigeria

In addition to the group of the selected resource dependent economies, the author attempts to have separate parallel analysis via 3 country analysis including Azerbaijan. **The main idea is for this initiate is to support the understanding of the current position of the Azerbaijan economy.**

In this particular country comparison study, the selection of the countries is not random. The first country: Norway has five decades experience as the resource dependent economy. In the light of this experience, Norwegian economic development milestone is extensively investigated and recommended to the resource dependent economies by scholars. Consequently, those countries which suffered from the recent shocks in the world oil markets, have started to learn from Norway in order to ensure sustainable economic growth. Regardless the current Norwegian economic position and achievement, it has specific features which cannot applicable to other countries immediately. That is why, further research is recommended before application of any experiences.

The second country: Nigeria has the same period of experience with Norway as the oil dependent economy. However, the Nigerian economy has been affected from the shocks in the world oil market due to the inefficient revenue management. Apart from that there are other factors which will be investigated in the studies. The Nigeria experienced with the oil discoveries almost in the same years with Norway. On the contrary to Norway, the economy challenged to manage oil rents in the short and long run. That is why, the author has taken Nigeria as the "worst" scenario or sample for the Azerbaijan economy.

Comparatively, Azerbaijan doesn't have the same years of experience with the selected countries. In other words, Azerbaijan was not independent before 1991 and it is the main challenge to track and compare the statistics with Norway and Nigeria since 1970s. Nonetheless, the last 3 decades economic performance of Azerbaijan allows to diagnose. A key limitation of the recent research on the Azerbaijan economy is focused on the economic results and performance of the governance. This study introduces the whole historical picture of the Azerbaijan economy in order to understand the main roots of the challenges.
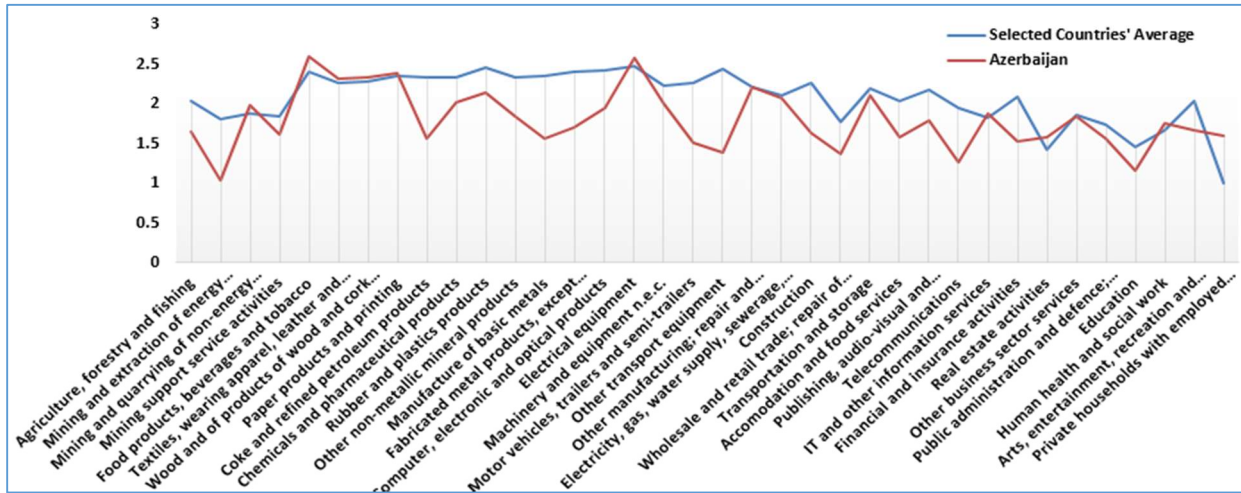
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[5] Rodgers J. L., Nicewander W. A., 2012. Thirteen Ways to Look at the Correlation Coefficient
https://amstat.tandfonline.com/doi/abs/10.1080/00031305.1988.10475524#.XLarQugzbIU

3. RESULTS AND DISCUSSIONS

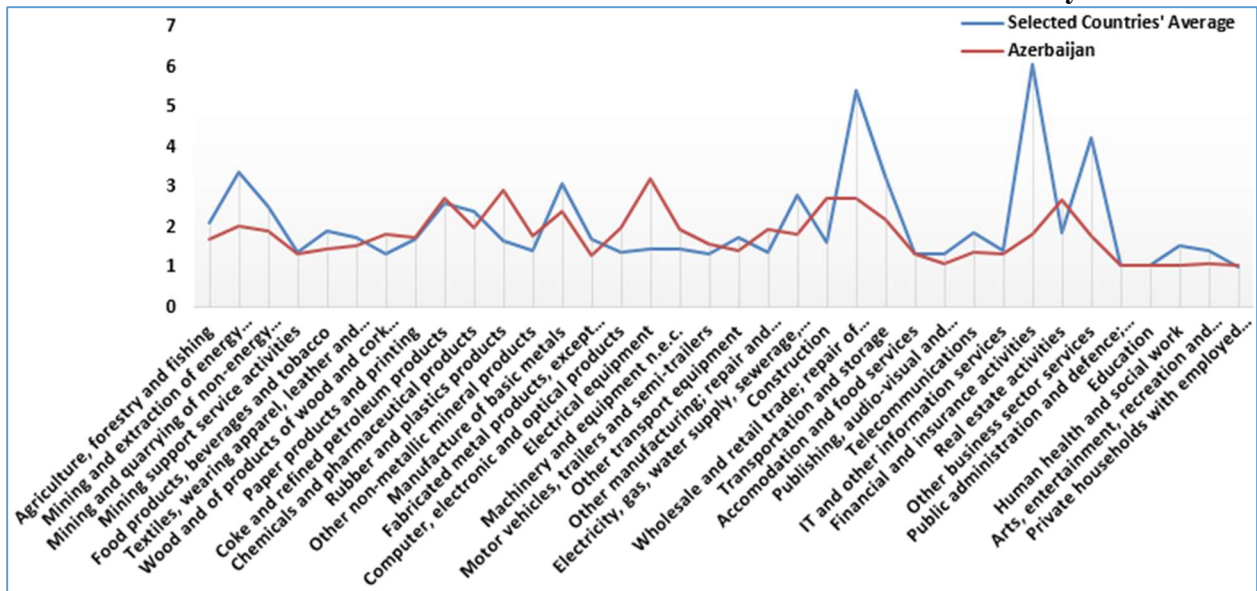## 3.1. Results of Input-Output analysis of the Azerbaijan Economy

The author has calculated means and standard deviations. Then summarized 81 available sectors of the official available Input Output table for Azerbaijan to the relevant 36 sectors of the selected countries' data. As the result, we can go for further investigations; whether the Azerbaijan numbers are in the range of standard deviation of the selected countries' data and how the Azerbaijan data is far from the selected countries' mean. Apart from the author shows those analysis in Graph 2, Graph 3 per each of the 35 sectors.

Graph 2. Leontief inverse matrixes - sum of columns -the total output needed for each unit of final demand of the relevant sector

Source: Authors own analysis based on the Input-Output tables

Graph 3. Leontief inverse matrixes - sum of rows- the total output needed from the relevant sector for each unit of final demand of the whole economy

Source: Authors own analysis based on the Input-Output tables

3.2. Interviews' outcomes

The first question asks whether the country has managed to utilize the resource wealth in the most efficient way or not. Responses are quite varied, however there is common belief. In the countries where there are deep economic issues, the respondents believe that, they could not manage efficiently. The main points are the current low social development indicators, the living standards. The most interesting answer is related to the term of efficient: the efficiency could be assessed based on the relativeness. So, for different benefit groups efficiency rate can be observed from 5% till 90%. In the short and long terms it is almost impossible to change the current picture in the efficient management of the resource revenue. Alternatively, in case of the countries with leading positive experience, cannot be considered perfect scenario, which motivate always to reach maximum benefit to all.

The second question tries to find the decision making in the dealing with the resource money, whether to spend, invest and reserve in a country or abroad. The importance of the learning other resource dependent economies' experience who have done well, emphasized in the return. Other scholars believe that, saving or investing the resource revenues (minimum half) abroad can be considered as one of the efficient ways. And the current local expenditures within a resource dependent would mainly be financed via the return rates of the investments in abroad. On the contrast views, the scholars appreciate the utilization of the resource rents in a country mainly in order to rebuild economy and the foster the economic development with minimum investment abroad. However, in case of the investing out of a country, the return revenues need to be reinvested locally again.

The next question completes the second one logically. So, the author is keen to know the efficient place to keep the resource reserves for the future generations: in a country or abroad. Interestingly, some respondents believe the only way to handle the reserves to the future to invest the rents in the local economic development and education. It is clear that the countries where there is need to the capital, the utilizing and keeping rents internally can be considered the efficient decision. However, in practice to apply this, is not easy job and not successful usually. That is why, the main part of the reserves would be allocated in abroad in order to prevent any internal risks caused by miss-governance, economic conditions and ensure global transparent environment.

The countries previous experience in the utilization of the resource rents have been evaluated differently by the respondents. The scholars mentioned that reinvestments the industrial, business, education sectors, all in all productive sectors are more efficient decisions by the government. The transparency and the efficiency of the internal usage of the rents are highlighted as the key factors by the scholars. Without noticing those two factors there is no meaning to talk further about the each country's experience. Other valuable thoughts are importance of the advance determination of the benefit groups before any investment decisions and the keep the resource-rent far from the political interests to prevent the misusing of them.

Based on the scholars' returns, the author summarizes that, the traditional sectors, like agriculture, tourism, manufacturing, petrochemical industries were leading part of the resource dependent countries' economies can foster the total output in the relevant states. On the other hand, communications, IT, infrastructure have been considered as the key directions for the countries.

In the question whether, the resource dependent economies' past historical experience can be considered as a sample for the Dutch disease, opinions are more close each other. The countries

where the resource sector challenges are leading, are likely to be considered as a good example. However, the key mutual return by the scholar is that, every country has own pass and it is hard to judge or say any specific country should be called as one infected by these diseases. And in addition to characterizing the experiences, the scholars believe that the dependence or addiction from the resource sector should be minimized in all manners in order to ensure independent environment for the rest of the economic sectors in an economy.

Regardless the current economic challenges in the resource economies, the scholars believe that, the delivered monetary policies by the government have been efficient including stabilizing currency regimes, inflation levels. However there have been also challenges and passive expansionary monetary policies in some countries.

Apart from that, the scholars support the implementation of the limitation or control over the resource rent transfers to the public spending. In case of direct infection the rents to the public expenditure can lead varied issues, particularly in the high volatility in the world energy markets.

Additionally, the respondents emphasize the importance of the traditional sectors role in the total export via elimination resource-based goods and services. As the final idea of the interviews, whether these resource-rich countries can learn from each-other in the managing oil-gas rents, the scholars believe that, the countries can learn from their unsuccessful experiences in order to tackle the relevant challenges.

The author has collected interesting responces from the scholars in Azerbaijan on the country's economy. The content of the interviews had been summarized and shared via social media tool to the audience: Nijat meets Experts in Baku: The Economic Situation in Azerbaijan (https://www.youtube.com/watch?v=eyCbgoMHXV0)

Here are the key asked points and summary of the feedbacks:

The current situation in the Azerbaijan economy and crucial changes in the recent years – The national currency has been volatile in the neighbor oil exporting countries, Russian Federation, Kazakhstan, Azerbaijan and the government has applied floating currency regime in Azerbaijan. Decision makers in the central banking system of Azerbaijan could not find out the real market price of the national currency. The Azerbaijan economy has been mono product-oil exporting country particularly since 2014. The economic reforms by the government are highlighted by another scholar as the positive sign in the current volatile environment. On the other response inefficient usage of the financial reserves of the Central Bank of Azerbaijan is mentioned particularly. Closing down of the commercial banks by the Azerbaijan government cannot be the real solution in the current issues due to their weak participation in the banking system.

As the key recent reform/action package (Road Map) by the government in Azerbaijan is evaluated by the scholars too: Generally respondents' and author believed and noted that this reform package might be considered as the good sign of the reforms and initiatives. Definitely, only time will show how this reforms will work. However, since the document accepted, there is still no crucial changes in the matter of the economic development.

The new approach in terms of the fiscal policy in the new document can lead better results as hope. Any direct subsidizing connection between public expenditure and non-oil gas growth in the total output should not be strong. Attracting new foreign direct investment should be set as priority in

the government's agenda. Non-oil sector should be focused more while it holds the main part of the employment in Azerbaijan.

Taxation in the Azerbaijan economy, any increase in the rates by the government whether are expected and welcomed is asked: Stable approach in the taxation by the governors is crucial for the private sector. Any increase in the rates can lead mistrust between tax payers and the government. Transfers from the oil rents will be again crucial part of the public spending. The volume of the public spending are highly correlated with the state revenue. In the higher budget the government has been spending to the main infrastructural projects. In the smaller budget the government will not go to the higher spending, hope there will be no need to increase any tax revenue via increasing the tax rates. In worst scenario any increase in the tax rates should not be dramatic and should not demotivate the active players in the economy.

The human resources policy in Azerbaijan: The bridges between institutions, employers, employees, job seekers should be focused to minimize the issues on the agenda. The approach to the general employment issues should be reformulated and enhanced.

The government's approach to the agriculture in Azerbaijan: The innovation in the agriculture should be focused to reach to the goals via active communication between the authorities and the producers.

3.3. Results of Optimization - Goals

In the first goal, the author has compared optimal maximum output (solved via linear programming tool) with the given output value per 80 sectors. As the result of this cluster, the author groups the sectors in two directions:

The first group: production is over optimum value-66 sectors are in this group. It is clear that, extraction of crude petroleum and natural gas sector has one of the greatest portion of the over optimum level. The main reason might be existence of the resource dependent economy in Azerbaijan. Apart from that, the author highlights the construction and public administration, defense sector as the overproducing areas. For those two, the reason might be huge government expenditure in infrastructure and public authorities and military.

The second group: production is under optimum value-14 sectors are in this group. This group shows quite interesting results. So, as the key driver of the economy, manufacture sector performs less efficiently, particularly transportation means and pharmaceutical industries. Not surprisingly, it has connection with the poor developed scientific and technical activities.

In the second goal, the author has calculated employment multiplier (via dividing optimal maximum output to the given compensation of employees) per 80 sectors. As the result of this cluster, the author groups the sectors in three directions. In total Azerbaijan economy has the capacity to increase the number of workplace more than 2 million.

The first group: employment is over optimum value-34 sectors are in this group (+174 thousands of workforce units). The first clusters shows that, just only in 6 areas of 34 sectors (manufacture of leather and related products; tobacco products; beverages; food products; fishing and aquaculture; crop and animal production, hunting and related service activities) has over employment with more than 100 thousands workplaces.

The second group: employment is under optimum value-33 sectors are in this group (-93 thousands of workforce units are needed). The major areas are warehousing and support activities for transportation; media services; manufacture of fabricated metal products; manufacture of basic metals; repair and installation of machinery and equipment.

The third group: employment is far under optimum value-13 sectors are in this group (2mln 356 thousands of workforce units are needed). Not surprisingly the major part of human recourses are needed in the manufacture of pharmaceutical products; products of wood and cork; plastic products; paper products; motor vehicles, trailers and semi-trailers; other transport equipment; machinery and equipment n.e.c.; computer, electronic and optical products; electrical equipment; other mining and quarrying. It is clear that, those sectors need more investment in all manners.

In the third goal, the author has calculated the share of the given trade balance as the part of the solved optimum output level. In comparison with the first and second goals, the third goal is connected with them as well. Only 7 sectors have the capacity to increase the export level due to the over optimum production value with the positive share in the trade balance. The major two sectors are the resource sector: extraction of crude petroleum, natural gas and food and beverage service activities. The major sectors (more than 20, mainly manufacture sectors) imports in crucial percentage of products due to poor development of manufacture sector in Azerbaijan.

3.4.   Results of Optimization – By Economic Sectors
The relative approach to the sectorial structure of the Azerbaijan economy shows us interesting results (Appendix V):

The sector of crop and animal production, hunting and related service activities produces 4 times more output and employs 90% more workers than optimum level. So, it means, as the main driver of the agriculture sector in Azerbaijan, the sector of crop and animal production, hunting and related activities needs to concentrate on the efficient production via applying innovative technologies in order to motivate additional labor force to move to the sectors and to ensure the sustainable output level respectively. The trade balance is -2% of the total output per the sector of crop and animal production, hunting and related service activities and that supports our result on over production.

The sector of forestry and logging produces 8 times more output and employs 18% more workers than optimum level. So, it means, as one of the main driver of the agriculture sector in Azerbaijan, the sector of forestry and logging needs to take care of the protection of the environment. The trade balance is 0% of the total output per the sector of forestry and logging and that supports our result on over production.

The sector of fishing and aquaculture produces 27 times more output and employs 10 times more workers than optimum level. So, it means, as the main driver of the agriculture sector in Azerbaijan, the sector of fishing and aquaculture needs to concentrate on the efficient production via applying innovative technologies in order to motivate additional labor force to move to the sectors and to ensure the sustainable output level respectively. The trade balance is 0% of the total output per the sector of fishing and aquaculture and that supports our result on over production.

The sector of extraction of crude petroleum and natural gas produces 22 times more output and employs 14% more workers than optimum level. It is clear that, Azerbaijan has the resource dependent economy with huge number of energy resource, which is why there is high level over

production. However, in such high level production, the labor force is relatively low. The possible reasons for that might be the application of the advance technologies and existence of the pipeline transportation. The trade balance is 95% of the total output per the sector of extraction of crude petroleum and natural gas and that supports our result on over production and existence of the resource dependency.

The sector of mining of metal ores produces 56% more output and employs 36% less workers than optimum level. So, it means, as the main driver of the mining and construction sectors in Azerbaijan, the sector of mining of metal ores concentrates on the efficient production via applying innovative technologies via attracting additional labor force. The trade balance is 1% of the total output per the sector of mining of metal ores and that supports our result on over production.

The sector of other mining and quarrying produces 13% less output and employs 42% less workers than optimum level. So, it means, as the main driver of the mining sector in Azerbaijan, the sector of other mining and quarrying needs to concentrate on the establishment of the local production facilities via applying innovative technologies in order to attract additional labor force and to ensure the sustainable output level respectively. The trade balance is -43% of the total current output per the sector of other mining and quarrying and that supports our result on under production and less efficiencies.

The sector of mining support service activities produces 8% more output and employs 42% less workers than optimum level. So, it means, as the main driver of the resource sector in Azerbaijan, the sector of mining support service activities needs to attract more labor force. The trade balance is -8% of the total output per the sector of mining support service activities and that show that the sector still imports the production means from abroad.

The sector of manufacture of food products produces 4.3 times more output and employs 3 times more workers than optimum level. The trade balance is -25% of the total current output per the sector of manufacture of food products produces and that means the manufacture of food still depends on the import. The sector of manufacture of beverages produces 20 times more output and employs 12 times more workers than optimum level. The sector of manufacture of tobacco products produces 3.5 times more output and employs 2.7 times more workers than optimum level. However, the trade balance is -874% of the total current output per the sector of manufacture of tobacco products and that means the economy heavily depends on the import due to the huge internal demand. The sector of food and beverage service activities produces 22 times more output and employs 3.37 times more workers than optimum level.

The sector of manufacture of textiles produces 2.9 times more output and employs 40% more workers than optimum level. However, the trade balance is -8% of the total current output per the sector of manufacture of textiles and that means the production capacity still can meet the local demand totally. The sector of manufacture of wearing apparel produces 33% more output and employs 7% more workers than optimum level. Not surprisingly the trade balance is -65% of the total current output per the sector of manufacture of wearing apparel and that means the local wearing market depends on the import. The sector of manufacture of leather and related products produces 3.1 times more output and employs 2.1 times more workers than optimum level. The trade balance is -12% of the total output per the sector of manufacture of leather and related products.

The sector of manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials produces 76% less output and employs 83% less workers than optimum level. So, it means, either the sector of wood needs to concentrate on the efficient production via applying innovative technologies in order to motivate additional labor force to move to the sectors and to ensure the sustainable output level respectively, or expansion of this sector conflicts with the environment protection policies, or the available raw materials are not sufficient for the local economy. Not surprisingly, the trade balance is -1495% of the total current output (15 times) per the sector of wood and that supports our result on under production. The sector of manufacture of paper and paper products produces 34% less output and employs 51% less workers than optimum level. The trade balance is -259% of the total current output per the sector of paper and paper products. The sector of printing and reproduction of recorded media produces 6% more output and employs 44% less workers than optimum level. The trade balance is -60% of the total output per the sector of printing and reproduction of recorded media and that supports our result on over production. The sector of manufacture of furniture produces 38% more output than optimum level and employs optimal level labor force. The trade balance is -132% of the total current output per the sector of manufacture of furniture and it can be considered quite efficient and balanced manufactural direction.

The sector of manufacture of chemicals and chemical products produces 78% more output and employs 8% less workers than optimum level. So, it means, as the main driver of the manufacture sector in Azerbaijan, the sector of manufacture of chemicals and chemical products needs to attract additional labor force in order to ensure the sustainable output level. The trade balance is -171% of the total current output per the sector of manufacture of chemicals and chemical products and that means regardless overproduction, still import has crucial impact to meet the local demand.

The sector of Manufacture of basic pharmaceutical products and pharmaceutical preparations produces 97% less output and employs 98% less workers than optimum level. So, it means, as the main driver of the health sector in Azerbaijan, the sector of pharmacy needs to concentrate on the efficient production via applying innovative technologies in order to attract additional labor force The trade balance is -90 times of the total output per the sector of pharmaceutical products and pharmaceutical preparations and that supports our result on under production, where the country needs to take immediate actions to reduce the dependency of the import.

The sector of manufacture of rubber and plastic products produces 41% less output and employs 60% less workers than optimum level. So, it means, as the main driver of the manufacture sector in Azerbaijan, the sector of manufacture of rubber and plastic products needs to utilize the raw materials from the oil-gas industry and attract more labor force in order to increase the total output. The trade balance is -209% of the total output per the sector of manufacture of rubber and plastic products and that supports our result on under production.

The sector of manufacture of other non-metallic mineral products produces 33% more output and employs 16% less workers than optimum level. The trade balance is -90% of the total current output per the sector of manufacture of other non-metallic mineral products and that shows the dependency on the import. The sector of manufacture of basic metals produces 17% more output and employs 39% less workers than optimum level. So, it means, as the main driver of the

agriculture sector in Azerbaijan, the sector of manufacture of basic metals needs to concentrate on the efficient production via applying innovative technologies in order to attract additional labor force and to ensure the sustainable output level respectively. The trade balance is -208% of the total output per the sector of manufacture of basic metals and that means there is dependency on the import. The sector of manufacture of fabricated metal products, except machinery and equipment produces 27% more output and employs 36% less workers than optimum level. The trade balance is -292% of the total output per the sector of manufacture of fabricated metal products and that there is huge dependency on the import as well.

The sector of manufacture of computer, electronic and optical products produces 53% less output and employs 74% less workers than optimum level. So, it means, as the main driver of the technological sector in Azerbaijan, the sector of manufacture of computer, electronic and optical products classified as the far under optimal level, that means there is need to concentrate on the innovations and the research development. The trade balance is -6 times of the total current output per the sector of manufacture of computer, electronic and optical products and that supports our results on under production. The sector of manufacture of electrical equipment produces 26% less output and employs 44% less workers than optimum level. The trade balance is -4 times of the total current output per the sector of manufacture of electrical equipment and that shows the huge dependency on the import.

The sector of manufacture of machinery and equipment n.e.c produces 59% less output and employs 72% less workers than optimum level. So, it means, as the main driver of the manufacture sector in Azerbaijan, the sector of manufacture of machinery needs to concentrate on the efficient production via applying innovative technologies in order to motivate additional labor force to move to the sectors and to ensure the sustainable output level respectively. The trade balance is 10 times of the total current output per the sector of manufacture of machinery and that supports our result on far under production level.

The sector of manufacture of motor vehicles, trailers and semi-trailers produces 98% less output and employs 99% less workers than optimum level. So, it means, as the main driver of the auto-car industry in Azerbaijan, the sector of manufacture of motor vehicles, trailers and semi-trailers is far than optimal level and there is need immediate actions to establish the production facilities via applying innovative technologies. The trade balance is -154 time of the total current output per the sector of manufacture of motor vehicles, trailers and semi-trailers and that heavily supports our result on the under production. Similarly the sector of manufacture of other transport equipment produces 94% less output and employs 98% less workers than optimum level. The trade balance is -88 times of the total current output per the sector of manufacture of other transport equipment and that supports our result on the under production.

The sector of other manufacturing produces 92% less output and employs 96% less workers than optimum level. The trade balance is -16 times of the total current output per the sector of other manufacturing and that shows that the rest of the manufactural sections are heavily depends on the import.

The sector of manufacture of coke and refined petroleum products produces 2.44 times more output and employs 43% more workers than optimum level. The trade balance is 5% of the total

current output per the sector of manufacture of coke and refined petroleum products and that supports our result on over production where the export is leading.

The sector of water collection, treatment and supply produces 2.3 times more output and employs 54% more workers than optimum level. So, it means, as the main driver of the agriculture sector in Azerbaijan, the sector of water collection, treatment and supply can meet the local demand. The sector of sewerage produces 31% more output and employs 28% less workers than optimum level. Similarly the sector of waste collection, treatment and disposal activities; materials recovery produces 2 times more output and employs 57% less workers than optimum level. The sector of remediation activities and other waste management services produces 4% more output and employs 52 % less workers than optimum level. So, generally it seems that, the protection level of environment by the Azerbaijan is satisfactory.

The sector of construction of buildings produces 4.4 times more output and employs 2.3 times more workers than optimum level. So, it means, as the main driver of the construction sector in Azerbaijan, the sector of construction of buildings provides more activities than optimal level. The sector of public administration and defense; compulsory social security produces 113 times more output and employs 49 times more workers than optimum level. So, it means, as the main driver of the public sector in Azerbaijan, the sector of public administration and defense; compulsory social security needs to concentrate on the efficient governance via applying reforms and redundancies.

The sector of land transport and transport via pipelines produces 2.13 times more output and employs 65% less workers than optimum level. On the other hand, the sector of water transport produces 2.46 times more output and employs 1.86 times more workers than optimum level. Based on the results of the land and water transportation, the total output seems over optimal level which may positive impact over the trade. The sector of air transport produces 46 times more output and employs 21 times more workers than optimum level. The trade balance is -14% of the total current output per the sector of air transport and that supports our result on over production. Regardless over production, the results shows that, the import is still leading in the trade relations.

The sector of accommodation produces 3 times more output and employs 67% more workers than optimum level. So, it means, as the main driver of the tourism sector in Azerbaijan, the sector of accommodation has the potential to affect the Azerbaijan economy.

The sector of electricity, gas, steam and air conditioning supply produces 2.6 times more output and employs 9% more workers than optimum level. So, it means the local demand to basic utilizes can be provided in the Azerbaijan economy. The trade balance is 2% of the total output per the sector of electricity, gas, steam and air conditioning supply and that supports our result on the over production.

The sector of publishing activities produces 17% more output and employs 37 % less workers than optimum level. So, it means, as the main driver of the education and media sectors in Azerbaijan, the sector of publishing activities needs to concentrate on the attraction of sustainable labor force in order to ensure the efficient output. Similarly the sector of motion picture, video and television program production, sound recording and music publishing activities produces just 6% more

output and employs 55% less workers than optimum level. The sector of programming and broadcasting activities produces 4.06 times more output and employs 7% more workers than optimum level. The sector of telecommunications produces 7.3 times more output and employs 2.2 times more workers than optimum level.

The sector of computer programming, consultancy and related activities produces 39% more output and employs 22% less workers than optimum level. Similarly the sector of information service activities produces 25% more output and employs 53% times less workers than optimum level. Regardless the over production, both sectors needs to ensure and motivate sustainable relevant skilled labor force.

The sector of financial service activities, except insurance and pension funding produces 17% more output and employs 69% less workers than optimum level. On the other hand, the sector of insurance, reinsurance and pension funding, except compulsory social security produces 48% times more output and employs 80% less workers than optimum level. The sector of activities auxiliary to financial services and insurance activities produces 36% more output and employs 50% less workers than optimum level. The limited development of the financial sector and lack of public trust can be one of the possible reasons to the low level employment.

The sector of architectural and engineering activities; technical testing and analysis produces 53% less output and employs 77% less workers than optimum level. This result shows the crucial issue in the construction sector in Azerbaijan due varied issues in the construction of the living houses. It means that, there are need immediate actions to be done by the governance to promote the business in this direction. Not surprisingly the trade balance is -180% of the total current output per the sector of architectural and engineering activities; technical testing and analysis and that supports our result on the under production.
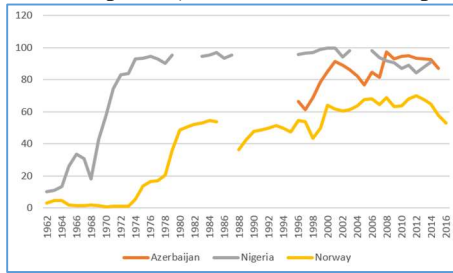
The sector of scientific research and development produces 65% less output and employs 98% less workers than optimum level. Similarly the sector of other professional, scientific and technical activities produces 93% less output than optimum level and employs almost 0% workers of the optimal level. So, this result is the crucial SOS signal for the economy. As the main driver of the innovations in Azerbaijan, both of the sectors need to concentrate on the efficient production via applying innovative technologies, learning the trend in the world in order to motivate additional labor force to apply for jobs in the research oriented. The trade balance is -268% of the total output per the sector of scientific research and development and that supports our result on the under production.

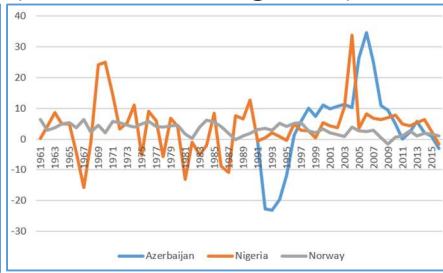### 3.5. Where is Azerbaijan between Norway and Nigeria?

In the data analysis section the author compares the main economic indicators of the selected countries. Although, per Azerbaijan, the data is the available from 1990s and there is missing information in some years per Nigeria from 1970s (Graph 4).
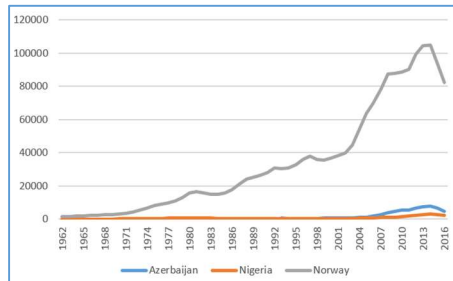
Graph 4. Norway, Nigeria, Azerbaijan in numbers
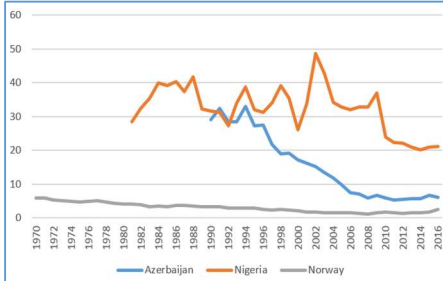
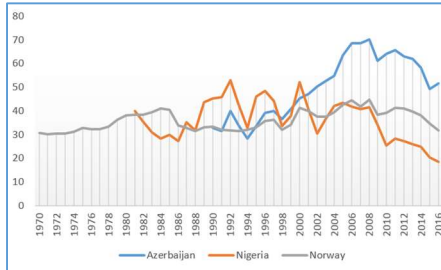**A: Fuel exports (% of merchandise exports)**   **B: GDP growth (annual %)**

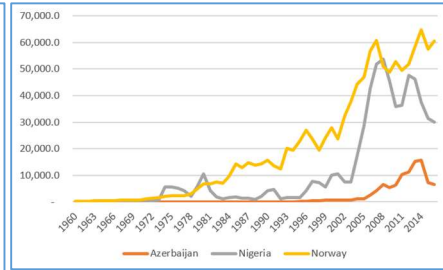**C: GNI per capita, Atlas method (current USD)**   **D: Agriculture, value added (% of GDP)**

E: Industry, value added (% of GDP)   **F: Total reserves (includes gold, current mln. USD)**

Source: The World Bank, http://data.worldbank.org/indicator

Not only data analysis, but also, the outcomes over the selected variables per the countries are significant and clearly summarized over tables and charts below. The results show that the oil rents and total reserves in the selected countries have positive perfect linear relationship within the mentioned periods. In particular, the association per Norway has been more stable and sustainable since the 1970s. Similarly, per Nigeria and Azerbaijan the relevant relationship is higher and strong. These results have been clearly visualized via scatter plots, making sure the linear association. Nevertheless, the correlations between the selected public spending and the oil rents conclude the negative strong line (weak per environment protection) with a negative slope per Norway. In contrast, there is evident positive-strong linear association between the selected public expenditures and the oil rents in Nigeria since 1977. Correspondingly, the relevant association between the selected expenditures and the oil rents in Azerbaijan has been large-strong and linear.

3.6.   Hypotheses Analysis
As the key expectations, validating hypothesizes help to observe and judge author's approach:

H1-The Azerbaijan economic structure has more common characteristics with the resource dependent economies. The author has calculated the coefficients of the inverse matrix for the Azerbaijan economy, grouped the sectors, and compared with the selected countries' standard range. So it means that, the major part of the sectors of the Azerbaijan economy have the similar

relations with the entire economy as the resource dependent economies have. This finding supports the hypothesis.

H2-The oil-gas sector has weaker relation with the entire economy than the selected countries' average level. Based on the delivered comparison, the author realized that in the Azerbaijan economy the resource sector could not manage to ensure close relationship with the rest of the sectors. That means the economy of Azerbaijan cannot utilize the energy resources and letting the raw products go for export not for local production. This finding supports the hypothesis.

H3-The Azerbaijan economic sector in general, consumes smaller output from each other, and requires smaller inputs in order to produce total output. Based on the delivered comparison, the author noted that, in generally the Azerbaijan economy consumes less input than the selected resource dependent economies. This finding supports the hypothesis.

H4-The Azerbaijan economy heavily depends on the import in matter of the non-oil sector related inputs. The official input-output table for the Azerbaijan economy, and the comparison between the optimum production level and trade balance shows that the dependency from the non-oil inputs are higher. This finding supports the hypothesis.

H5-The manufacturing sector is far from the optimal level which is needed by the local economy. The results of the optimizations prove that the Azerbaijan economy needs more investment to reconstruct the all kind of manufacturing sectors. This finding supports the hypothesis.

H6-If we dive into the statistics, data analysis of the economic experiences by Norway and Nigeria, we will realize that, the Azerbaijan economy has more common feature with Nigeria in comparison with Norway. The research results clear identifies that, the governances in both Nigeria and Azerbaijan have taken similar actions and pumped the oil rents directly to the public spending. Not only the numbers and data analysis, but the literature review for Nigeria and Azerbaijan confirms the hypothesis positively. This finding supports the hypothesis.

3.7.   New Results
This research: input-output approach is one of the few works done in this direction. The most of the researches were based on the local approach, the changes in the economy. However, finding the optimum output level, organizing parallels with the similar resource dependent economies help us to understand how is the Azerbaijan economy developed, what are the common challenges that experienced by other countries, where there are the opportunities to grow, what are the risks.

Notably, in all of the selected countries the oil rents are strongly associated which means resource money has been as the main driver in the cumulating the reserves. To emphasize, this is the key feature to put these countries in one group. However, another key results, the potential relationships between the oil rents and public spending have shown completely different view. So, this association has been negative in Norway in the last decade based on the selected spending directions where the correlations are significant. Indeed, it is not sufficient judge whole fiscal policy in Norway from inspiring these results. On the other hand, it provides crucial insights how the increasing resource money has been far from the current spending in Norway.

Comparatively, based on the results per Nigeria and Azerbaijan, these economies have passed common economic milestones. In the first place, the oil rents have been directly infected to the total public spending in the both countries. Not only data, but also literature on the Nigerian and Azerbaijan economies supports this study and results. Unlikely the research by Ismayilov and Aliyev[6] the author determines that, Azerbaijan has been tend to the Nigerian experience.

This research particularly raises the issues in the manufacturing sector in Azerbaijan and the resource dependent economies. Obviously as the key driver of the economy, the poor level local production and the dependence from the import makes the Azerbaijan economy limited and limits its ranges. The author finding in the employment in the Azerbaijan economy rejects the official statements by the governance. The study shows that there is need and capacity to open more than two millions workplaces in the economy. This indicators conflict with all public official announcements that there have been ensured additional workplaces in the number of millions in Azerbaijan.

The final results of the optimizations indicates that there is need to create more than 2 million workplaces, which means indirectly, there is serious employment in Azerbaijan.

The following findings clearly demonstrates the current economic characteristics by sectorial split in comparison with the selected countries:

The agriculture sector mainly sales the inputs to others where there is same kind of agricultural activities. In other word, the Azerbaijan economy consumes less agricultural inputs than the selected countries due to weak inter-sectorial relations in the economy.

The input from mining and chemical products has less sales to the agriculture sector in Azerbaijan. All in all, in the Azerbaijan economy the agriculture sector consumes less inputs than the selected countries, as the result it can cause less efficient and less diversified production.

The mining and quarrying of non-energy producing products sector mainly sales the inputs to itself and to the infrastructural sectors as metal pipes, cables and others. Another interesting point is that, the weak development the production of the transportation means can be showed the reason for the low input to this direction.

The sector of mining support service activities mainly sales the inputs to the mining related sectors. In other word, the Azerbaijan economy consumes less inputs of mining support service activities than the selected countries due to weak inter-sectorial relations in the economy.

The sector of mining support service activities mainly purchases means of transportation, equipment and construction materials as the inputs from others. This is related with the leading onshore and offshore oil-gas production activities.

The key point is that in the Azerbaijan economy the cash is the main driver in the daily payments. It is clear that the sector of paper products and printing has crucial roles in the financial and insurance activities in Azerbaijan.

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[6] Ismayilov, A. and Aliyev, X., 2010. The successful model in the management of the oil rents: Norwegian Model. *Journal of Qafqaz University*, (29).

The Azerbaijan economy has the risk to cause plastic pollution to the environment.

It is clear that, the sector of manufacture of basic metals mainly sales the inputs to infrastructural sectors where it's input are key tool for them. Apart from that, the sector of the financial services gets more input from the sector of manufacture of basic metals due to the higher cash turnover in Azerbaijan.

The Azerbaijan economy receives more inputs of computer, electronic and optical products than the selected countries' average, which means the digitalization in the governance is in good progress.

The Azerbaijan economy receives more inputs of electrical equipment than the selected countries' average which means the usage scale of the electronics is wider. The sector of electrical equipment needs to be developed more efficiently.

The sector of mining and extraction of energy producing products consumes less utilities, which can be considered the efficient from production point of view. However, in the lower waste collection means the higher threat to the environment in Azerbaijan.

The main part of the construction inputs are directed to the infrastructural sectors, public administration which are the public expenditure items in the public spending. Not surprisingly, the mining support service activities absorb on of the higher input from the construction sector due to the leading oil-gas productions.

In the Azerbaijan economy:

- the sector of wholesale, retail trade, repair of motor vehicles has weaker sales relations with the rest of the economic sectors in comparison with the selected countries due lack of production facilities.
- the sector of transportation and storage has weaker sales relations with the rest of the economic sectors in comparison with the selected countries. It is clear that, the sector of transportation and storage mainly sales the inputs agricultural and food related activities. Additionally, the sector of transportation and storage has less participation in the mining and extraction of energy producing activities.
- the sector of accommodation and food services has weaker sales relations with the rest of the economic sectors in comparison with the selected countries. Interestingly, the oil-gas sector and education gets less the accommodation facilities services which is the crucial issue for the sustainable wellbeing of the workers and ensuring the qualitative education to the young people.
- the sector of publishing, audio-visual and broadcasting activities has so weak sales relations with the rest of the economic sectors in comparison with the selected countries. Not surprisingly, this support the current development level of the movie and publishing industries in Azerbaijan.
- the sector of telecommunications has weaker sales relations with the rest of the economic sectors in comparison with the selected countries, which means there is huge need to apply innovations in Azerbaijan.
- the sector of IT and other information services has weaker sales relations with the rest of the economic sectors in comparison with the selected countries. This result shows that, the oil-gas sector needs more investment from technological perspectives in order to improve efficiencies.
- the sector of financial and insurance activities has so weaker sales relations with the rest of the economic sectors in comparison with the selected countries, particularly, the insurance.
- the sector of other business services has weaker sales relations with the rest of the economic sectors in comparison with the selected countries which is the key obstacle for the development of the economy and business in Azerbaijan.

- the sector of education has weaker sales relations with the rest of the economic sectors in comparison with the selected countries. It is clear that, the education sector mainly sales the inputs to the public sector.
- the sector of human health and social work has weaker sales relations with the rest of the economic sectors in comparison with the selected countries.
- the sector of arts, entertainment, recreation and other service activities has weaker sales relations with the rest of the economic sectors in comparison with the selected countries.
- the sector of machinery and equipment has stronger sales relations with the rest of the economic sectors in comparison with the selected countries. Interestingly, the mining support service activities and public defence are in the list of sectors which get major of the machinery and equipment sector's sales as the inputs. The main reason for those, can be the existence of the resource dependence and the military needs.

4. CONCLUSIONS AND SUGGESTIONS

4.1. Suggestions for the Decision Makers and Future Studies

The author has had attempt to investigate the recent decades' economic experience of Azerbaijan particularly after the boom in the oil-gas sector. Obviously, without complex research approach it would be difficult to understand the key challenges for the economy. This complex approach has started from deep literature dive via understanding scholars' works for Azerbaijan and other resource dependent economies and ended with constructing optimization model. Apart from that, the author highlights the key actions by the governance in Azerbaijan and their outcomes.

All mentioned factors and the economic situation in 2016 persuaded the government to accept the reform package that called Road Map. Definitely, the efficiency and implementation of the Road Map is another discussion's topic. The author would like to walk through some points over the document. The feedback is that, the document has more generalist approach in case of the development areas. Particularly the reasoning part of the document has to be highlighted. The document can be considered one of the key acknowledgment by the government in the last decades. In the document only external factors had been mentioned, which seems limited approach to the key issues. Interestingly, in the short-run showing the eastern European countries as target-model countries via making parallels and learning their experience for the Azerbaijan economy seems controversial. Because in the past the Azerbaijan economy only were compared with the leading economies in the world due to the higher GDP growth rate. The current economic situation persuaded the government to be more realistic.

Another key point: learning and implementing the Norwegian experience in the Azerbaijan economy. Particularly in the applying the limitations on the transfers from the oil rents to the fiscal policies. Recent years shows that, even in case of the wishes to apply this kind of implementations, it is so hard to realize these steps due to the nature of the mono-economy or resource dependent economy of Azerbaijan. On the other hand the required financial resources are not specified clearly. It seems that there is still high intention to utilize the public revenue on these reforms initiates which can cause imbalance in the entire economy and lack of the development of the rest sectors in Azerbaijan.

The author opens the crucial door to the future research directions for the Azerbaijan economy and resource dependent economies. There is a big hope that, the scholars who have the common research interests will benefit from these research results. On the other hand this study might be

guidance in order to prevent any recurring inefficient decisions by the relevant governance members. And last but not least the author will cover the current economic challenges via applying and testing the new econometric models.

5. SUMMARY

In summary, the author has focused on the learning the resource dependent economies, the Azerbaijan economy, and making parallels between them. Generally, after the long research, the author believes that the Azerbaijan economy has not gotten the unique experience in comparison with the similar countries. However, without doubt there are many factors which require the further research. Definitely those factors have the connections out of the economic terms, such as good governance issues. Regardless the mentioned limitations, and issues, the author claims that, this work can be considered one of the limited research's on the Azerbaijan economy.

In brief, the author has summed upped the following ideas via testing the hypothesis:

- the major part of the sectors of the Azerbaijan economy have the similar relations with the entire economy as the resource dependent economies;
- the economy of Azerbaijan cannot utilize the energy resources and letting the raw products go for export not for local production;
- the Azerbaijan economy consumes less input than the selected resource dependent economies;
- for the Azerbaijan economy the dependency from the non-oil inputs are higher
- the Azerbaijan economy needs more investment to reconstruct the all kind of manufacturing sectors

The research results clear identifies that, the governances in both Nigeria and Azerbaijan have taken similar actions and pumped the oil rents directly to the public spending. Not only the numbers and data analysis, but the literature review for Nigeria and Azerbaijan confirms the hypothesis positively.

This research has shown that where Azerbaijan is in the comparison with the selected countries via investigating the relevant literature and data. All literature reviews, data analysis are considered, the institutions, good governance, transparency play the main role in the economies in order to ensure the sustainable management of the oil rents.

The author has deep confidence over the understanding the Azerbaijan economy which is visible from the results of research. In the last five years, the author has spent crucial amount of time in order to realize the root cause of the economics issues in the Azerbaijan economy. Particularly, the input-output approach helped to find out the level of the interconnections between sectors of the economy. Another approach, finding out the position of the Azerbaijan economy via making parallels with the selected countries, helped to diagnose the economic structure and the circumstances in Azerbaijan. The author is sure that, this research has to be considered as the key recommendation package in terms of the implementing economic reforms in Azerbaijan.

6. CURRICULUM VITAE OF THE CANDIDATE

EDUCATION

2015 –	**Szent István University, Ph.D. candidate in Management and Business Administration**
2012 – 2014	**Baku Engineering University, MSc in Financial Management**
2007 – 2011	**Azerbaijan State Economic University, BSc in Finance and Credit, General Economics**

WORK EXPERIENCE

Advanced Accountant	Genpact, Shared Services Center	2019 -
Senior Finance Analyst	Diageo, Shared Services Center	2017-2019
Accountant	Pasha Construction LLC	2013-2015
Mortar Team Leader	Azerbaijan Military Services	2011-2012
Licensing, Finance Expert	AFFA – UEFA	2010-2011 / 2012-2013
Shop Assistant	Local Supermarkets	2006-2008

OTHER COMPETENCIES

Language	**Azerbaijani**	mother tongue
	English	excellent
	Turkish	excellent

IT skills: **Microsoft Excel; Microsoft Office, COINS, Logo UNITY2, SAP, Oracle-CCL, SSS**

LIST OF PUBLICATIONS AND CONFERENCE PROCEEDI-NGS

Huseynov N., 2015. The Impact of Public Expenditure on Economic Growth, Case of the Azerbaijan Republic, „Science connecting nations" 2nd VUA YOUTH scientific session, 25 November 2015, Szent István University, Gödöllő, Hungary, Faculty of Economics and Social Sciences

Huseynov N., 2016. a. The Impacts of Oil Price Volatility on Azerbaijan Economy Public Policy Implications, Scientia Iuventa 2016, 21. Apríl 2016 Banská Bystrica

Huseynov N., 2016. b. Approach to Azerbaijan Economic Structure: Non-Oil Sector, North International Conference on Economics NICE 2016, September 23 – 24, 2016, Baia Mare, Romania, http://econ.cunbm.utcluj.ro/nice2016/

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Huseynov N., 2018. The Impact of the Falling Oil Prices on the Banking Sector and the Banking Crisis in Azerbaijan, Eurasian Journal of Social Sciences, Eurasian Publications, vol. 6(1), pages 17-28.http://eurasianpublications.com/Eurasian-Journal-of-Social-Sciences/Vol.-6-No.1-2018/EJSS-3.pdf

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