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The De-industrialization Process In Azerbaijan: Dutch Disease Syndrome Revisited

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This paper focuses on the de-industrialization processes of Azerbaijan adopting the Dutch disease syndrome as the theoretical framework. After the emergence of Dutch disease hypotheses, resource-rich countries have become its main object of research. The consequences of Dutch disease syndrome are chronically appreciating national currency, a shrinking manufacturing sector compared to the booming sector, and the services sector. In order to shed light on this aspect of the Azerbaijan economy, important literature examples regarded de-industrialization and Dutch disease were examined and descriptive statistics applied to visualize the economy's recent timeline. This research mainly brings back the actuality of the Dutch disease phenomena to Azerbaijan's economy, connecting it to the de-industrialization process on employment, output, and trade level. The main intention is to depict and to compare policy responses of the national government during and after such crisis periods like 2008–2009 and 2014–2015 in a systematic detailed manner.

Keywords: Dutch disease, de-industrialization, oil tradable sector, non-oil tradable sector, non-tradable sector

1. Introduction

The de-industrialization process is a decline in the value-added manufacturing sector as a component of employment, output, and trade of the economy. Various reasons may lead to the de-industrialization process and one of them is Dutch disease syndrome, as it was modeled in the work of Corden and Neary (1982) in its direct and indirect form. In fact, Palma (2008) mentioned Dutch disease as the reason for possible de-industrialization in developing countries. Mainly, Dutch disease is the consequence of a booming sector which increases domestic income and demand for goods (Badeeb et al. 2017). Discovery or dependency on natural resource extraction and exports are the most popular forms of Dutch disease. As Bresser-Pereira (2013) indicated, Dutch disease results in chronic exchange rate appreciation and inflation. This leads to an increase in the price of the non-booming sector commodities, leading to the lower competitiveness of these, as well as lowering investments they might otherwise attract. This negative effect on economic growth is called spending effect with indirect de-industrialization outcome. The second effect is the resource movement effect which happens when labor and capital move out from the rest of the economy to the booming sector resulting in direct de-industrialization. Resource movement effect might not happen if the booming sector is relatively non-labor intensive or they can occur at the same time. Therefore, structural changes in the economy at the expense of the manufacturing sector leads to de-industrialization process.

Many studies support the argument that industrialization, particularly manufacturing, is the engine for the economic growth (Lewis 1954, Kaldor 1966, 1967, Szirmai 2013, Szirmai et al. 2013). Accordingly, any lagging in the industrialization process may lead to economic slowdowns with structural disequilibrium. Several studies examined Dutch disease symptoms in the Azerbaijan economy (Hasanov 2010, 2013); however, the results were not unanimous on the existence of the phenomena and specifically regarded de-industrialization tendencies (Egert 2009, 2012, Gahramanov–Fan 2002). In fact, exchange rate appreciation, changes in real wages, and a shrinking manufacturing sector and other industrial sub-sectors on the background of the 2008–2009 – global financial crisis and in 2014–2015 – sharp commodity price downturns showed consistent symptoms of Dutch disease literature.

After the collapse of the Soviet Union, many former member states faced extreme economic adaptation hardship adjusting to the new challenges of independence. Previously established common markets, industrial structures, and trade relations were lost, which led to a troublesome shift towards the market economy. Political instability, short-lived governments, and military conflicts did not allow for recovery from the economic downturns which started in the early 90s. All of this required new structural transformations, the creation of effective reforms in the economy. The Republic of Azerbaijan was no exception; however, having rich oil and gas resources brought new challenges to the transition process, pushing the government to use the easily available mineral resources, crowding out manufacturing and even the agriculture sector. Although the country's proven total oil and gas reserves are only 0.4% and 0.7% of total world reserves respectively (British Petroleum Company 2018), natural resources played a major role in attracting revenue to the economy during and after the transition period. It also influenced the non-oil sector of the economy. In fact, in 2010 the share of manufacturing in industrial production was 74% less than in 1990 at the current prices, while GDP derived from agriculture decreased from 32.5% in 1991 to 12.4% and 5.6% in 2003 and 2017 years respectively (SSCRA 2019a). Furthermore, manufacturing contributed just 5% in 2007, while the mining industry had a 53.7% share. Also, the mining sector dominated in attracting both local and foreign investments between 2005–2016 at 73.8% of the annual average, while manufacturing got only 8.7% (SSCRA 2019b).

The first boom in oil revenues occurred during the beginning of the last century and oil and gas extraction started to become the main industry of Azerbaijan during Soviet administration. In the early 90s the main trade objective of international economic relations and foreign policy was oil and oil products, as it used to be during the USSR era. with the main difference being that compared to Soviet years, the country's economy polarized into extractive industry and crude oil and chemical products exports. Subsequently, the overwhelming dominance of the oil and gas sector in the economy brought various risks to the country's economy and one of them was the de-industrialization process.

This study found overlapping trends among the various sectors in Azerbaijan related to resource movement effect and spending effect of Dutch disease, which

causes direct and indirect de-industrialization. Therefore, during 2008–2011 which was a period of the huge foreign revenue inflow into the country, sharp decline in manufacturing value-added employment, output and trade data point to the de-industrialization process as the result of resource movement effect. Also, the progress in the share of the tertiary sector indicates the spending effect of Dutch disease as a result of high government expenditure.

This work illustrates the possible descriptive paths of the de-industrialization processes as the main extension of Dutch disease hypotheses in Azerbaijan. The present paper uses descriptive statistics to compare the oil tradable sector, the non-oil tradable sector, and the non-tradable sector in the context of employment, output, and trade to track particular decline trends and de-industrialization patterns.[1] It is important to note that the factor endowments of the country identify the optimal structure of the industry also determining the country's competitiveness during a particular period of time (Lin 2015). Azerbaijan's industrial heritage can be observed from the 90s and early 2000s even those years are accompanied by economic stagnation and crisis. In this case, observing the increasing dominance of extractive industry and decreasing role of non-oil and non-tradable sector will provide us a general impression of the presence of the Dutch disease effects. Therefore, the most important aim of the work is to identify de-industrialization trends, clarifying certain connections to the previous Dutch disease studies, at the same time, contrasting policy responses of the national government according to the critical years of 2008–2009 (global financial crisis) and 2014–2015 (sharp commodity price downturns). So far, there has not been any special emphasis among the international publications regarded the de-industrialization of Azerbaijan's economy in terms of employment, output and trade level. Subsequently, this paper intends to explore some aspects of lagging industrialization in Azerbaijan.

The evaluation of the general government programs, goals and certain policy tools indicate that from the economic policy perspective the government tried to apply some policies, however, no strong emphasis on Dutch disease phenomenon or the de-industrialization process can be observed. Mainly, the government aimed to incentivize non-oil sector agents via certain programs and to preserve vanishing sectors. Certain institutional reforms were completed, however all government goals and programs still heavily consider oil revenue and its management techniques. In terms of more concrete policy measures and tools, national currency devaluation and fiscal framework – "New Budget Policy" are first attempts to transfer the economy from the pro-cyclical policy to the countercyclical policy. Hence, there are many challenges in front of those government programs, goals, and policy measures to overcome, and since the acknowledgment of Dutch disease or de-industrialization is still lacking, there is long way to achieve a diversified and sustainable economy.

[1] More detailed information regarded this sectoral division has been presented in the third section of the paper.

The paper is organized as follows. Section 2 provides a literature review of the theoretical background related to de-industrialization, the importance of the manufacturing sector, and Dutch disease syndrome. In Section 3, data sources, key indicators, the definitions of industry and sectors, and methodology are depicted to explain how the analysis of the de-industrialization process of Azerbaijan was carried out. Section 4 demonstrates the descriptive characteristics of de-industrialization patterns through Dutch disease effects and sectoral disproportions on three levels: employment, output, and trade. In Section 5, policy responses, their accordance with the industrialization process during the last crucial years and recommendations on the future policy implications are mentioned. Section 6 draws a conclusion.

2. Literature Review

Starting from the eighteenth century, several technological advancements and innovations, alongside the expanding markets, led to rapid industrialization. Later on, the Industrial Revolution term was coined to describe those radical changes related to textile production and the application of steam power in Britain. Consequently, the industrialization process was a function of technological advance leading to the transformation process of production (factory system, specialization-based division of labor, etc.) and a remarkable increase in income per capita. The economic growth resulting from industrialization and specifically from manufacturing raised labor productivity and concentrated the production process in large-scale enterprises (Kemp 2013).

Several studies have confirmed that industrialization contributed to the economic growth of developed and developing countries over time, arguing in particular that the manufacturing sector is the engine of the development. For instance, Fagerberg and Versbagen (1999, 2002) regressed real GDP growth rates and growth rates of the manufacturing sector in 76 countries concluding that industrialization produced higher growth rates in Latin America and in the East Asia region, but the effect was lesser in advanced economies excluding the period of 1950–1973. Some other recent research has focused on low and middle-income countries like South Africa and African countries (Olamade–Oni 2016, Moholwa 2017), Turkey (Ozturk–Altinoz 2018), and on some Central and Eastern European countries (Ulbrych 2017) defending the thesis that the output of the manufacturing sector plays a key role in the economic growth of that country. Furthermore, industrialization has also played a big role in the catching-up process of developing countries since 1950 (Szirmai et al. 2013). That is why policy-makers should pay attention to it and take measures if manufacturing underperforms. However, the second half of the twentieth century brought new challenges to the industrialization process for both developed and developing countries. Significant declines in the share of manufacturing in GDP and manufacturing employment among upper and middle-income countries brought attention to the de-industrialization phenomenon which appeared as a result of the post-industrial development stage or structural changes.

Research on the de-industrialization process emerged in the 1960s and 1970s in the UK as a result of concern with economic growth slowdowns. Singh (1977) depicted de-industrialization as a structural disequilibrium in the UK where the manufacturing sector was losing competitive ability despite rising productivity and price competitiveness. Later on, positive and negative de-industrialization concepts were brought up by Rowthorn and Wells (1987). This meant that if the services sector can absorb the labor resulting from manufacturing, this is positive de-industrialization, while the opposite meant negative de-industrialization. Also, the same authors proposed a third type of de-industrialization – trade de-industrialization as a change in the structure of net exports away from manufacturing goods towards other goods and services. Koritz (1991) described de-industrialization as a reversal of the industrialization process while pointing out the differences between de-industrialization and destructuring, and de-industrialization and restructuring. Kollmeyer (2009) indicated de-industrialization was behind the declining trend in employment in the processing industry. Then, as cited in Hegyi-Kéri (2016), Gregory et al. (2009) identified de-industrialization as responsible for the continued downturn of industrial activity and capacity, especially in the processing industry.

Rodrik (2016) mentions employment de-industrialization (as a decline of manufacturing employment in the share of the total employment) and output de-industrialization (as a drop in the value-added manufacturing share of GDP at current and constant prices). In his research, Rodrik used the term premature de-industrialization for developing countries, initially introduced by Dasgupta and Singh (2006), instead of de-industrialization. Sampling mainly developing and late industrialized countries, Rodrik (2016) concluded that countries in Latin America and in sub-Saharan Africa without having experienced sufficient industrialization had turned into services economies and faced drops in their manufacturing employment and share in GDP.

De-industrialization is a quite commonly observed phenomenon among the early industrialized, as well as, so-called "latecomer" countries. It was investigated in countries like the UK (Forsyth and Kay 1980,1981), the USA (Koritz 1991), and India (Amirapu and Subramanian 2015, Simmons 1985). However, it remains an ongoing process in Latin America (Palma 2008), East Asia (Koo et al. 2016), and sub-Saharan African (Noorbakhsh–Paloni 1999) countries. Analysis of the historical data shown in the work of Rowthorn and Ramaswamy (1997) also determined a de-industrialization trend among European Union countries, the United States, Japan, and some other countries between 1960–1994. The catastrophic decline of employment in manufacturing and basic industries triggered the study of de-industrialization with extensive consideration of the phenomenon in developing countries (High 2013). Thus, the growing body of literature regarded the importance of the manufacturing sector and industrialization as an engine of growth leads to acknowledging the de-industrialization issue as the main policy measurement for economic development.

The most popular hypotheses of de-industrialization for a long time was an "Inverted-U" relationship between manufacturing employment and income per capita. It was accepted as a natural process in mature economies because they start to provide

specialized services based on their development. However, de-industrialization differs from country to country based on historical development and the forces behind it. Van Neuss (2018) summarized existing explanations of de-industrialization as follows: non-homothetic preferences – changes in demand resulting from changes in income, technology – movement of labor to stagnant or non-progressive sectors of the economy due to improved technology or productivity growth in the particular sectors, input-output linkages, and outsourcing – the changing nature of the production system via intermediates, and international trade – comparative advantage may crowd out other non-competitive sectors due to the relative-price effects. Naturally, various countries or regions experience de-industrialization differently. So, early tendencies are a mixture of the first and the second explanations by Van Neuss (2018) and according to Robert-Nicoud (2008), despite technological advancements leading to industrialization, it also changed the fact that the goods need to be produced near the point of final consumption due to the rapidly falling trade costs since 1960. Moreover, as cited in Robert-Nicoud (2008), Autor et al. (2003) reported that between 1960 and 2000 the decomposition of the US labor force showed a lower mean share of routine tasks, pointing to the role of offshoring in de-industrialization process. Falling trade costs because of globalization is a popular hypothesis among the explanations of de-industrialization. For instance, according to Bogliaccini (2013), the reason for de-industrialization in the middle-income Latin American countries[2] between 1980 and 2000 was a causal link between trade liberalization and income inequality. Furthermore, Brady and Denniston (2006) indicated different effects of globalization in the process of industrialization and de-industrialization process in liberal market economies, European countries and command market economies. The main finding is that there is a curvilinear relationship between globalization and manufacturing. At low levels, globalization supports manufacturing via differentiation and specialization, while high levels of globalization lead to saturation lowering manufacturing's share in the labor force. Moreover, on the subsample level of the study, globalization had significant effects among liberal market economies and European countries but not in command market economies. To sum up, having all these differences from country to country based on the particular force of de-industrialization, certain specific structural changes like having a booming sector is also highly related to de-industrialization as discussed on the following paragraphs.

Palma (2008) emphasized the other source of de-industrialization which is Dutch disease. In fact, the de-industrialization process as a result of having a booming sector originates from the original theory of Corden and Neary (1982). Despite the fact that the reasons why a country may experience Dutch disease can differ (commodity boom, tourism, oil, etc.), the main reason why it is linked with de-industrialization relies on crowding out effects from the booming sector. In fact, while having a booming sector, countries like the Netherlands, United Kingdom, Brazil, etc. witnessed rapid falls in manufacturing employment and output. Furthermore, rising

[2] Argentina, Brazil, Chile, Costa Rica, Mexico, Uruguay, and Venezuela

levels of expenditure on services and globalization were considered as possible reasons of de-industrialization (Williamson 2006), despite Iversen (2001) indicating that globalization or trade openness has a little or insignificant role in these processes.

The intellectual basis for the importance of the manufacturing sector for economic growth can be traced back to Kaldor (1966, 1967) and Lewis (1954). Kaldor's model encompassed both supply and demand side, emphasizing dynamic economies of scale like a positive correlation between manufacturing output and manufacturing productivity. Accordingly, he proposed three laws: higher manufacturing output leads to higher economic growth; the productivity of the manufacturing sector positively influences manufacturing growth (also known as Verdoorn's law); the growth of the manufacturing sector is positively connected to the productivity of non-manufacturing sector. Lewis argued that industrial development presents a clear path to capital accumulation and economic growth because the capitalist system expands continuously via reinvesting profits if there is unlimited labor supply at subsistence wage levels. Rodrik (2016) mentioned that manufacturing activities are crucial for growth due to features like technological dynamism, the absorption capacity of high quantity unskilled labor and being tradable. Moreover, there are other popular arguments especially in the case of manufacturing: (i) the empirical connection between industrialization and per capita levels point to the reason why rich countries are rich, (ii) the manufacturing sector has higher rates of productivity growth than the other sectors of the economy (iii) favoring manufacturing is a good way of overcoming structural change burden (iv) manufacturing contributes to capital accumulation more than agriculture or services (v) the availability of economies of scale is higher than in other sectors (vi) to make technological advancements is easier in manufacturing than services (vii) linkage and spillover effects are stronger in manufacturing (viii) due to Engel's law, primary and agricultural product exporters will not benefit from the expanding world markets for manufactured goods (Szirmai 2013). From this perspective of the importance of the manufacturing sector for economic growth, we can argue that the development of the manufacturing sector should be a crucial policy choice for national governments. Nevertheless, a discovery or abundance of either natural resources or agricultural products lead to the so-called Dutch disease syndrome and Palma (2008) proposed Dutch disease as a new trigger of de-industrialization in contrast to conventional approaches to de-industrialization.

Coming to Dutch disease hypotheses, in 1977 "The Economist" introduced the term to illustrate how the Dutch manufacturing sector declined after the discovery of the large natural gas field in the North Sea in 1959 (The Economist 1977). The phenomena explain how the manufacturing or agriculture sector shrinks because of the great amount of foreign currency inflow into the economy's "booming sector." The first definitive model of Dutch disease was coined by Corden and Neary (1982) to describe the effects and structural changes of the boom-generated economic growth. The classic model of the Dutch disease theory identifies two sectors: tradable - the booming sector and manufacturing (lagging) or non-tradable – including services. Generally, the extraction of natural resources such as oil, natural gas, non-

ferrous metals, or the production of coffee or cocoa are the main sources of the booming sector. However; usually, manufacturing and agriculture are the lagging sectors. If a resource boom happens, this influences the economy in two ways: the resource movement effect and the spending effect. The resource movement effect is the shift in production away from the manufacturing sector through increased labor demand. This effect can be negligible if the booming sector uses relatively little labor and capital compared to the other sectors. On the other hand, the spending effect is the flow of revenue towards the non-tradable sector via additional revenue that the booming sector generates.

Several studies have tried to evaluate countries like Canada (Stanford 2012), Australia (Corden 1996), the United Kingdom (Ross 1986), Nigeria (Ezeala-Harrison 1993), Norway (Larsen 2006) in terms of Dutch disease syndrome. Consistently with the model, the common claims were dependence on primary exports, poor productivity growth, real exchange rate appreciation, and declines in agriculture, value-added manufacturing employment, and value-added manufacturing output. Moreover, Gurbanov and Merkel (2010) gave some country examples like Norway, Nigeria, Indonesia, and Botswana where Dutch disease has been successfully overcome.

At the end of the 90s and beginning of the 2000s, early attempts were made to investigate the Azerbaijan economy within the Dutch disease framework. Singh and Laurila (1999) drew attention to Dutch disease phenomenon in Azerbaijan in the middle and in the long term because of the risk of the overshooting in real exchange rates. The authors mentioned that Dutch disease might be a policy issue if the inherited industrial heritage were not used as the basis for restructuring. In other words, the real sector of the economy might experience pressures.

Other research related to early Dutch disease diagnostics in Azerbaijan came from Gahramanov and Fan (2002). The authors used the extended version of the Balassa (1964) and Samuelson (1964) model (included variables TOT, i.e. prices of export over prices of imports) to determine if Dutch disease could be found in terms of increases in the purchasing power of the Azerbaijani Manat in real terms. Briefly, Balassa (1964) and Samuelson (1964) model predicts that real appreciation in the national currency will occur as the result of faster productivity growth in tradable sector compared to non-tradable goods and services. Therefore, the price of tertiary sector services will rise in response to fast productivity growth in the tradable sector leading to high probability of inflation. The study revealed that a10% rise in the price level caused the real exchange rate to fall (appreciate) by 8.7%, real wages to increase due to the lower increase in the consumer price index, while external oil price shocks hardly influenced Azerbaijani Manat between 1994 and 2001. Thus, the authors concluded that the monetary side of Azerbaijan economy did not show any vulnerability to Dutch disease syndrome.

Kaser (2003) described possible threats of Dutch disease to the Azerbaijani economy in line with the diversification and political risks based on the macroeconomic comparison of transition countries. A similar study was done by Auty (2001) on Caspian basin region countries concluding that there is evidence of Dutch

disease syndrome among the resource-rich transition countries. However, for the later years, Egert (2009, 2012) argued that due to the declining relative oil prices and lack of data, it is not possible to track Dutch disease effects among post-soviet countries.

Considering these examples from the literature, the research questions for this paper are as follows:

1. Does the employment, output, and trade data show the direct and indirect de-industrialization patterns as the result of the resource movement and spending effect of Dutch disease in Azerbaijan?
2. What have the policy responses of the national government been as a reaction to critical years like 2008–2009 and 2014–2015, to shelter the primary export-based economy and particularly value-added manufacturing sector from a potential de-industrialization process?

3. Data and Methodology

Conducting descriptive analysis of Dutch disease related de-industrialization is complex research and requires sophisticated approaches from different angles. In order to do so, the economy of Azerbaijan was analyzed through three aggregated sectors – oil tradable sector, non-oil tradable sector, and non-tradable sector, similar to Hasanov (2013) who conducted a Dutch disease related study on Azerbaijan. The sectors are the summation of related sub-sectors of the economy. For instance, oil tradable sector contains oil and gas extraction, chemical industry, electricity, gas and steam production, distribution and supply services. Despite such sectors like chemical industry or electricity production being considered as manufacturing sector in the statistical classifications, they are based on natural resources and have comparative advantages compared to the non-oil sector, so they were included in oil tradable sector to have a clearer non-oil tradable sector. Moreover, the role of the distribution and supply aspect, meaning the influence of the services related to oil and gas extraction or related industries, is very small, so it does not distort the big picture related to oil tradable sector. In turn, mainly non-oil tradable sector is the value-added manufacturing goods such as textiles, machinery, production of electrical and electronic equipment, weaving and cloth production, food and beverage production, metallurgy and etc. Also, it should be noted that, besides specific sectoral data related to non-oil tradable sector on the aggregated scope, some data sets combine agriculture, fishery, and forestry data to draw a comparative format, even though the decline in agriculture, forestry or fishery is not de-industrialization. The non-tradable sector consists of service sectors such as the construction, transportation, communication, and other tertiary sectors. Hence, the relevant sub-chapters will compare changing trends in the aggregated sectors (namely oil tradable sector, non-oil tradable sector and non-tradable sector) and based on the knowledge from the literature review, de-industrialization process will be analyzed as a shrinkage of the value-added manufacturing sector as a part of non-oil tradable.

Due to availability issues, certain data types can be found either in the form of mining or in a form of oil tradable sector, and the data related to value-added manufacturing also represented in a form of different kinds of simple and complex industrial products in various parts of the paper. Generally, when we say mining sector in Azerbaijan, it is extraction of crude oil and natural gas, mining of metal ores, mining of stone, sand, gravel, salt and other mining industry production, as well as mining support service activities. However, the main purpose of this paper is to descriptively compare oil tradable sector and non-oil and non-tradable sectors with the sub-sectoral levels like textiles, food and beverage production, etc. In fact, the data presented as mining does not distort our analysis because the average percentage share of oil sector (extraction of crude oil and natural gas) as a share of mining used to be 89.66% between 1990–2017.[3] Furthermore, the main difference between non-oil tradable sector and value-added manufacturing is that non-oil tradable sector may contain agriculture data but value-added manufacturing strongly sticks to the such sectors as production of television receivers, manufacture of food and beverages, manufacture of furniture, manufacture of machinery and equipment, etc.

On the sub-sectoral data level, particular sectors were emphasized in the relevant sub-chapters to compare pre-boom and post-boom trends. Moreover, various literature examples have been connected to each de-industrialization dimension to explore the drivers behind the trends. Consequently, the fourth chapter of this study frames de-industrialization on three levels: employment, output, and trade. Again, it should be noted that the term "de-industrialization" has not been used for non-oil tradable sector but only for value-added manufacturing because non-oil tradable sector also may contain such data as agriculture, forestry or fishery.

Main data sources are from the State Statistical Committee of the Republic of Azerbaijan, the Central Bank of Azerbaijan and the World Bank national accounts data, and OECD National Accounts data files. In the study, descriptive statistics were applied to compare the annual and periodic percentage changes of given variables. Due to the availability issues, some chapters and sub-chapters incorporate data from the 90s while the others illustrate only the 2005–2017 period. Considering the fact that the country's huge oil revenue started to flow into the economy in 2008, it still can present the necessary information for an overall impression.

Also, certain time periods on the graphs were set at 3 or 5 year ranges to depict a more understandable overview of the economy while certain graphs present consecutive time series data. It does not bias the visualization and interpretation of the constructed data because there are not any big deviations from the general trends. The ranges were organized in a way to encapsulate important breaking points.

The visual patterns of both three-sector and sub-sector de-industrialization data provide an initial understanding of the Azerbaijan economy in the context of

[3] This can be easily found on the data set included in the Reference List named SSCRA (2019c): State Statistical Committee of the Republic of Azerbaijan. Available: https://www.stat.gov.az/source/industry/en/007en.xls Accessed: January 18, 2019.

Dutch disease hypotheses. Notwithstanding, our brief evaluation of the national policy decisions of the government allows us to see the underlying reasoning from the economic policy-making point of view. Policies included are the results of presidential decrees published on the electronic database of the Ministry of Justice of the Republic of Azerbaijan[4].

The findings will contribute to further research regarded Dutch disease effect in Azerbaijan economy and its possible relationship with this particular type of de-industrialization, for example, employment de-industrialization to understand how labor market structures can be influenced by the booming sector. Moreover, precisely this de-industrialization phenomenon in the Azerbaijan economy has never been a focal point among interested researchers, so this study could well serve as a general analytical framework connecting the de-industrialization experience of resource-rich countries to more mainstream de-industrialization studies.

4. De-industrialization Patterns in Azerbaijan

The Azerbaijan economy experienced severe industrial downsizing like other former member countries of the USSR during the 90s. In fact, Azerbaijan's GDP had already shrunk by 17% between 1985 and 1991 (Cornell 2015). However, losing old economic relations and common markets after the collapse of the Soviet Union were not the only reasons why the economy faced these difficulties. Indeed, the loss of 20% of territory containing fertile land as the result of the devastating war with Armenia, having one million internally displaced refugees, very negatively influenced the socio-economic environment of the country (Ibrahimov 2016). This chapter will analyze how on the background of the booming sector other sectors of the economy experienced structural changes, while simultaneously making comparisons with previous Dutch disease-related studies. In order to do so, first it is important to get a glimpse of the general macroeconomic and fiscal data, then employment, output, and trade data will show the main trends of de-industrialization.

During Soviet times, the central government used central planning tools to shape the industrial structures of the member countries. Industrial production and the division of labor and trade were regulated by Moscow. Azerbaijan's main exports were oil products, machinery, weaving, and wine products, and the main trade partners were countries like Russia and Ukraine (Nuri Aras et al. 2016). Most of all, the oil and gas based extractive industry played a huge role in being a priority in the central government's economic policy. Naturally, the current industrial structure is a legacy of the Soviet period and several development stages of the oil and gas industry. According to Karpov (2010) there were five stages in the growth of the oil and gas industry in the post-soviet area: the first – from the mid-1860s to 1920, the second from the beginning of 1920 until 1932, the third 1933–1950, the fourth from the middle of 1950 until the end of 1980, and the fifth 1980–1990.

[4] - http://www.e-qanun.az/

The oil sector's role in the economy was very prominent during both the pre-Soviet and Soviet period. In fact, the world's first oil boom happened in 1874 in Azerbaijan thanks to the efforts of the Swedish Nobel brothers, culminating in 1901 (over 10 million tons a year). So, during the first stage of oil industry growth in the post-soviet period, western investment dominated. Azerbaijan had in fact accounted for 70% of crude oil production in the whole USSR area in 1941. Then, starting from 1960 oil production moved to Siberia and Kazakhstan leading to decreases in the oil industry's output and the necessary investment towards oil and gas (Laurila 1999). Consequently, the fifth stage of the development of the oil and gas industry which encompassed the 1980–1990 period was not actual for Azerbaijan. This resulted in an indicator of 3% of the Soviet Union's oil production and labor force migration (Cornell 2015). Then, the first years of independence brought enormous stress to economic activities and relations because of the transition process.

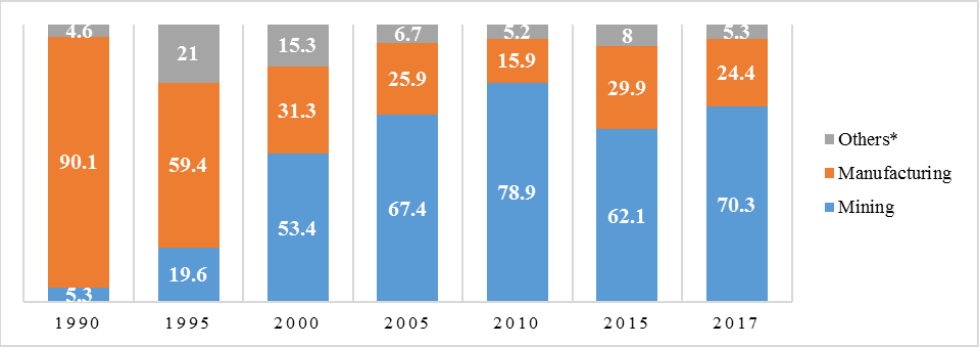
The first years of independence were characterized by a severe fall in industrial production, structural changes and refurbishments of the old oil and gas industrial infrastructure. More precisely, it was a 38% decline in industrial production in 1994 compared to 1990. At the same time, real average monthly wages were 17% less than in 1989 with 25% spent on household consumption (Cornell 2015). These early trends were followed by a booming sector – oil tradable sector and decreasing manufacturing share in the industrial production. After the recovery from the 1998 oil price downturns, the oil and gas industry started to operate remarkably successfully through Azerbaijan International Operating Company and State Oil Company. Baku–Supsa pipeline started to deliver the oil to Black Sea ports and Baku-Tbilisi-Ceyhan was completed in 2006 leading to large-scale oil production and huge oil revenue. Over time, the oil and gas extraction or mining sector took over the lion's share of industrial production.

Figure 1 shows how the structure of industrial production in Azerbaijan changed over the period of 27 years, from 1990 to 2017 (at current prices as a share of overall industrial production). At the risk of oversimplification, this major trend depicts a dramatic decline in manufacturing while notable increases in the mining industry up to 2010. However, it does not mean that crude oil and gas fields were discovered in 1990 leading to an exact repeat of Dutch disease as happened in 1959 in the Netherlands. This structural transformation frames how mining, mainly the extractive industry became a so-called "booming sector" whilst manufacturing's share dropped from 90.1% to 15.9% in 2010 and contributed 29.9% and 24.4% in 2015 and 2017 respectively.

Another dimension of the topic lies in the answer to the following question: did the transition effect play a predominant role in the de-industrialization process of the manufacturing value added sector? Despite a definitive answer being very difficult, Figure 2 shows that the economy of Azerbaijan recovered in the year 2005to a level of 24.8 billion USD compared to 22.2 billion USD (constant 2010 USD) in 1991. Between these dates, we observe a gradual decrease in real GDP until 1995, then moderate increase until 2005. The trend is more or less the same with GDP in current prices, it shows the recovery of the economy in 2004 (8.7 billion USD) compared to the year 1991's indicator of 8.2 billion USD. So, because of exceptional circumstances, we observe a shrinking manufacturing value added sector during the 90s, however, the de-

industrialization trend after 2005 and during the oil revenue boom period – roughly between 2008–2014 years should be treated independently of any so-called "transition effect".

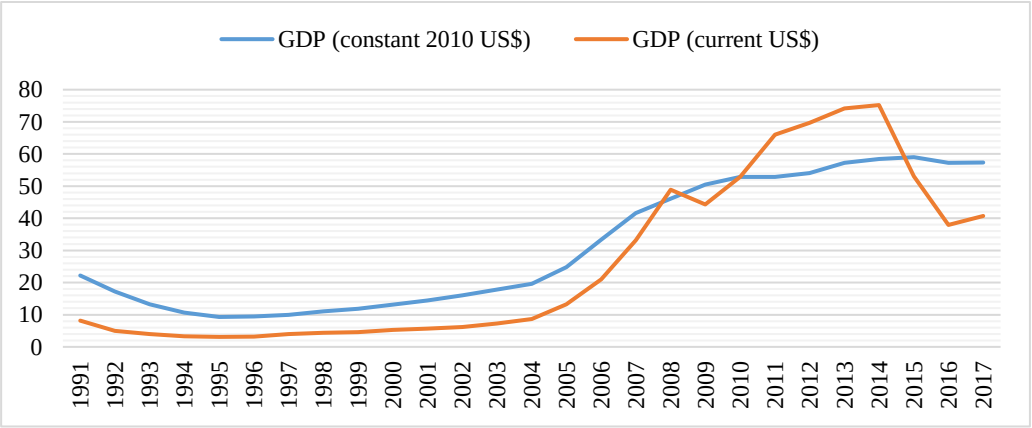
Figure 1 Sectoral Structure of the Industrial Production in Azerbaijan (in % of gross total)



*Others include electricity, gas and water related production, recycling and logistics
Source: Own construction based on SSCRA (2019c)

Moreover, further data and analysis to this research will show that a sharp rise in GDP after 2005 was because of the oil tradable sector, and there were particular fluctuations, including sharp downturns in the value-added manufacturing sector (non-oil tradable sector). Consequently, we can accept the prevalence of the transition effect during 1991 and in the years 2004/2005. Given this, however, successive time periods should at least have contributed to an improvement for the manufacturing sector and we must somehow assume that the deterioration of value-added manufacturing sector or the other sectors were not the sole responsibility of the transition process or any effect with an expectation of upward trends in the non-oil tradable sector.

Figure 2 GDP of Azerbaijan in constant and current USD (billions USD)



Source: World Bank national accounts data, and OECD National Accounts data files.

It is also worth noting the distorted character of Figure 1 regarding early 90s mining data. Crude oil and gas production experienced a gradual fall between 1990 until 1994, from 9.9 million tons to 6.4 million tons (Table 1). However, we observe the increasing share of the mining sector in both industrial production and in the total exports because of the inflated volume of its value in terms of price. So, it is important to bear in mind the fact that the drops in the non-mining sector exaggerated the role of mining in industrial production in the early 90s. Starting from 1996, the oil and gas sector became a stable, growing industry gaining more and more share in total industrial production.

Table 1 The production and export data of mining and oil and gas sectors during early 90s

	1990	**1991**	**1992**	**1993**	**1994**	**1995**
Crude oil and gas production, in millions of tons	9.9	8.6	7.9	6.8	6.4	9.9
Volume of mining sector at factual price, million Manat	12.9	36.8	404.7	1888.6	19.0	346.5
Share of oil and gas in total exports, in %	12.2	10.9	18.4	16.4	22.3	12.2

Source: World Bank (1995), SSCRA

At the same time, Table 2 outlines the changes regarded gross value added in GDP by economic activity between 1991 and 2017. The table shows that agriculture played a very major role during the early 90s, however after 2004 its share hovered around 5–7 %. Manufacturing value added followed the same trend bottoming out below 10% after 1996. The contribution of services fluctuated over time achieving high shares in recent years like 2015, 2016, and 2017 at 41.4%, 40.1%, and 38.8% respectively. Meanwhile, an increasing trend in construction and services point out the spending effect of Dutch disease.

Table 2 Gross value added in GDP by economic activity in Azerbaijan, 2005–2017 (%)

Years	Agriculture*	Industry			Construction	Services
		Overall***	Mining**	Manufacturing value added		
1991	32.5	31.6	-	-	-	36.6
1992	26.1	36.6	-	21.9	-	28.9
1993	27.1	32.1	-	12.9	-	35.9
1994	32.3	27.6	-	12.6	-	38.0
1995	25.3	31.0	-	11.5	-	37.9
1996	24.9	35.1	-	10.4	-	30.8
1997	20.1	37.0	-	8.3	-	35.8
1998	18.1	35.0	-	8.3	-	43.3
1999	18.4	39.1	-	6.0	-	39.0
2000	16.0	42.5	-	5.2	-	35.7
2001	14.8	43.4	-	6.1	-	34.4
2002	13.9	46.1	-	7.4	-	32.4
2003	12.4	48.5	-	8.6	-	31.9
2004	10.9	50.7	-	8.2	-	31.7
2005	9.1	48.7	42.2	6.5	9.0	26.2
2006	7.1	56.7	50.9	5.8	7.7	24.0
2007	6.7	58.7	53.7	5.0	6.4	22.7
2008	5.6	57.4	52.7	4.7	7.0	24.7
2009	6.1	47.9	42.4	5.5	7.2	32.5
2010	5.5	50.6	45.9	4.7	8.1	29.0
2011	5.1	52.0	48.0	4.0	8.0	29.0
2012	5.1	47.3	43.1	4.2	10.1	31.3
2013	5.4	43.4	39.2	4.2	11.6	32.9
2014	5.3	39.0	34.3	4.7	12.6	35.6
2015	6.2	31.4	26.4	5.0	12.0	41.4
2016	5.6	35.6	30.7	4.9	10.5	40.1
2017	5.6	38.8	34.1	4.7	9.5	38.8

* The data also includes the forestry and the fishery data

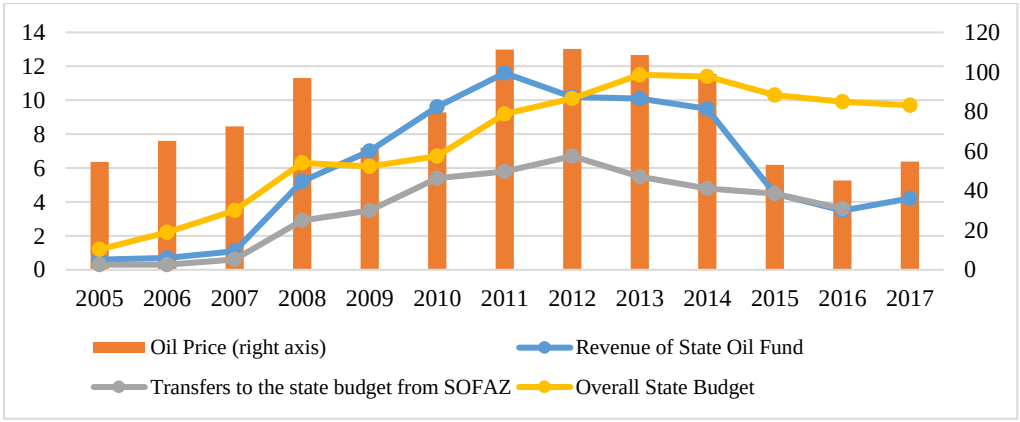
** Starting from 2005 year, the mining sector was mainly based on extractive industry, meaning oil and gas extraction. The share of oil and gas in the extractive sector ranged between 90–96%, only dropping to 87% in 2017.

*** The data includes construction data between 1991–2005.

Source: Own Construction based on SSCRA and World Bank data

Figure 3 depicts the main trends in the Azerbaijan economy related to the oil price and revenue. According to the Figure 3, there are three main boom periods in oil: the first, until 2008 when the oil prices kept growing while revenue of the State Oil Fund and Transfers from it to the state budget were low; the second, when huge amounts of foreign currency flowed into the economy increasing the fund revenues and transfers to the state budget (2008–2011); the third, gradual (2011–2014) and sharp (2014–2015) declines in both oil revenue and transfers. These trends are compatible with the changes in the oil and non-oil tradable, as well as, the non-tradable sectors of the economy, as will be discussed later on. The following sub-chapters examine these trends against the background of sectoral changes and Dutch disease research devoted to Azerbaijan.

Figure 3 Fiscal aspects of oil sector and oil price (Brant trademark), in USD (right axis) and revenue of the State Oil Fund and State Budget (billion USD); 2005–2017



Source: State Oil Fund of the Republic of Azerbaijan (2017), Annual Report; Macrotrends Brent Crude Oil Prices

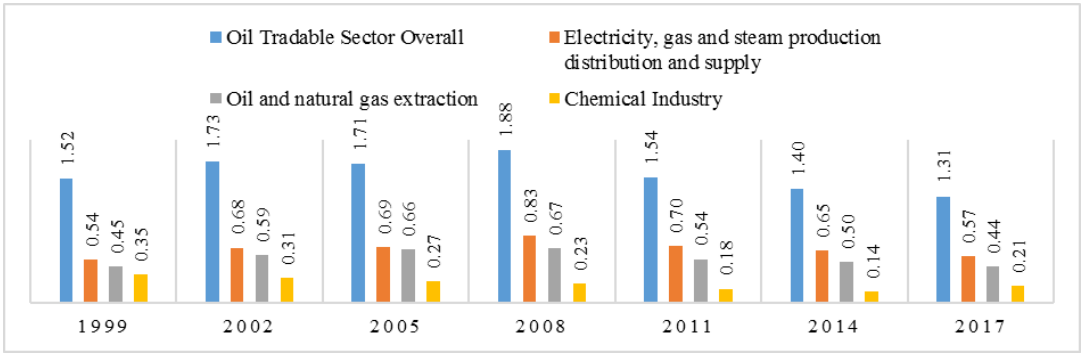
4.1. Employment De-industrialization

According to the Dutch disease model, resource movement effect causes direct de-industrialization in the manufacturing and service sectors, reducing the output of non-tradable sector because of the rise in demand and profitability for labor in the booming sector. According to Corden and Neary (1982), resource movement consists of two parts: movement of labor from the lagging sector to the booming sector and from the non-tradable sector to the booming sector. In contrast, the spending effect raises the output of non-tradables because government expenditures seek to provide extra demand for the non-tradable sector through the accumulated foreign currency. In other words, based on the magnitude of a certain effect, we can track Dutch disease related de-industrialization patterns through employment data.

Figure 4 illustrates employment trends in the oil sector as share in total employment in Azerbaijan between 1999 and 2017, a period of 18 years. Consistent with the Dutch disease theory, when a booming sector is labor-intensive and labor is mobile among the sectors, it should attract labor force from the other sectors. Overall, the share of the oil tradable sector in total employment slightly increased until 2008 and rose to 1.88% when it experienced decline and bottomed out at around 1.31% in 2017. So, it is interesting that, despite having "booming sector" status, the oil sector also faced a slight employment decline starting from 2008 until 2017. Following the same development trend, the other two biggest sub-sectors of oil tradable sector – electricity, gas and steam production, and oil and gas extraction showed gradual growth until 2008 while the chemical industry shrank to almost half, from 0.4% to 0.2% over the eighteen years' timescale.

The employment trends in the oil sector are related to the execution and completion phases of the upstream and downstream projects in the oil and gas production. For example, the largest oil field - Azeri Chirag Guneshli (ACG) was prepared to provide the necessary crude oil to the Baku–Tbilisi–Ceyhan pipeline and the other oil pipelines in 2008. Consequently, until the year 2008, there were three development stages: 1. development of Central Azeri started in 2005; 2. Development of East Azeri started in 2005, and in 2006 West Azeri platforms were established; 3. The launch of Deepwater Gunashli platform in 2008. In the gas production, the largest gas field is Shah Deniz and the estimated total investment is 10 billion USD. Subsequently, the relevant exploitation projects were finished around 2006 (Ciarreta and Nasirov 2012). Meanwhile, because of the transition process and decreases in energy consumption, modernization issues caused employment decline in other sub-sectors of oil tradable sector such as electricity, gas, and steam production and chemical industries.

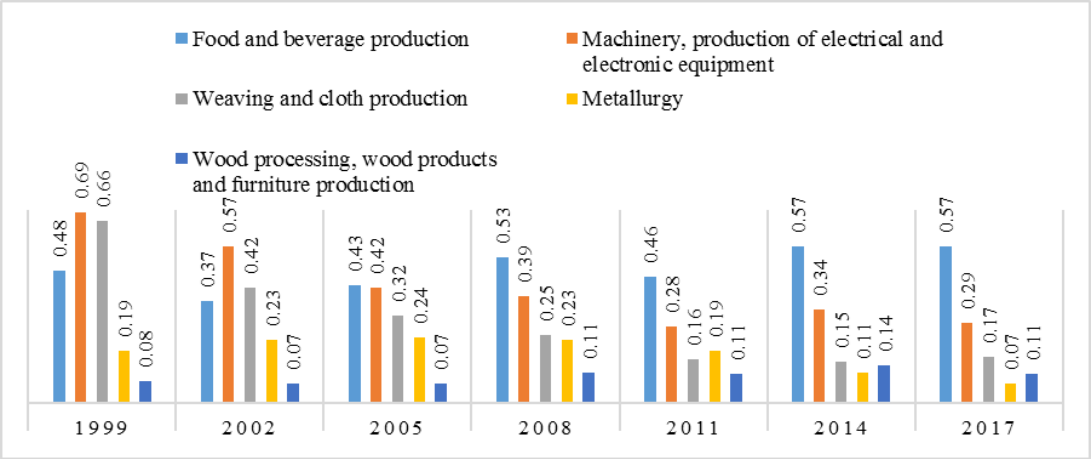
Figure 4 Employment data of the oil tradable sector, 1999–2017
(% of the total employment in the economy)



Source: Own construction based on SSCRA data (2019d; 2019e)

As the biggest representative of non-oil tradable sector, agriculture also experienced employment decline over the 1999–2017 period while other sub-sectors of non-oil tradable fluctuated (Figure 5). Agricultures sector employed 41.49% of the labor force in 1999, however during and after oil booming, it had dropped to 36.35% by 2017. In terms of de-industrialization, particular manufacturing sectors showed a downward trend. For instance, weaving and cloth production accounted for a very low share in total employment at 0.15% in 2014 compared to the late 90s when it was 0.66%. Machinery, production of electric and electronic equipment showed constant decreases starting from 1999 until 2011, from 0.66% to 0.16%, but slightly enlarged its share around 2017. In fact, there has been an overall relative employment de-industrialization in the biggest representatives of the non-oil value added manufacturing tradable sectors of the economy. After the oil boom period as well as in the years of crisis, metallurgy sector downsized noticeably to 0.07% in 2017 from the pre-crisis period of 2005 – 0.25%. The general trend in wood processing, wood products and furniture production is more or less stable – between 0.08 % and 0.11%. The last sector mainly addresses domestic and regional markets of the country, however, still it is part of non-oil tradable sector.

Figure 5 Structure of employment of non-oil tradable sector, 1999–2017
(% of the total employment in the economy)

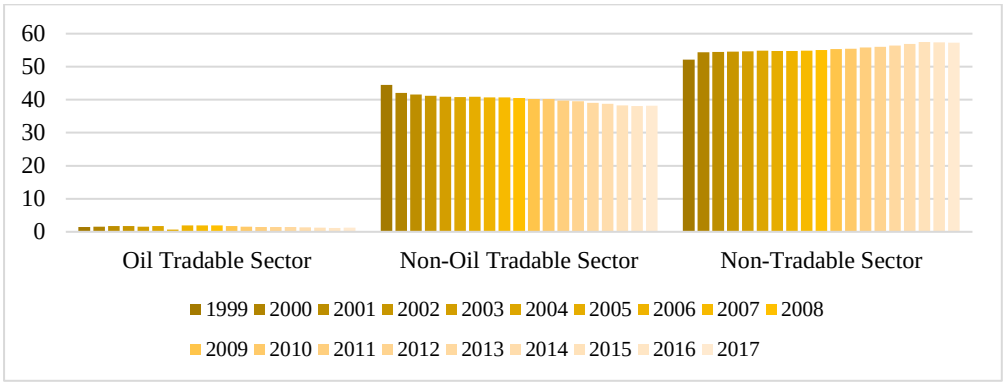


Source: Own construction based on SSCRA data (2019d; 2019e)

Figure 6 depicts the general comparison of oil tradable, non-oil tradable and non-tradable sectors. The overall impression is that oil tradable sector experienced employment fall and non-oil tradable sectors witnessed employment de-industrialization between 1999 and 2017 while non-tradable sector increased its share in total employment from 52.1% to 57.3%. In terms of resource movement and the spending effect of Dutch disease, both effects are slightly apparent in a descriptive manner.

Hence, Sadik-Zada et. al. (2019) conducting Input-Output analysis for 2006, 2008 and 2009 data in Azerbaijan, concluded that the oil sector did not get integrated into the local economic structure despite having a wealth of qualified human capital, local content policies, and infrastructure. This highlights the currency of Hartwick's rule (Hartwick 1977) for sustainable development in a natural resource abundant country. It is a well-known fact that natural resources like oil and gas are non-renewable exhaustible resources. Society can reach a point when dependence on natural resource extraction and exports cannot be fulfilled with the low stock levels of depleted natural resources. So, Hartwick's rule in resource economics states the amount of spending towards produced capital (buildings, roads, knowledge stocks, etc.) that is needed to counterbalance of declining natural resource stocks.

Figure 6 Sectoral structure of employment, 1999–2017
(% of the total employment in the economy)



Source: Own construction based on SSCRA data (2019d; 2019e)

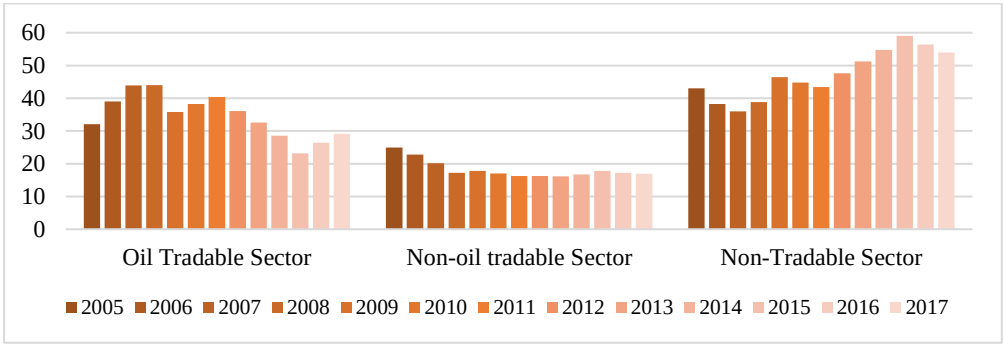
4.2. Output De-industrialization

As a result of certain labor force movements, the output levels of sectors change commensurately. The Dutch disease model describes direct de-industrialization (resource movement effect) as the output fall in manufacturing, rise in wage rate in the booming sector at a constant real exchange rate, and reduced service sector output. On the other hand, indirect de-industrialization (spending effect) is an increase in the non-tradable sector's output as a response to providing excess demand against a background of fluctuating exchange rate towards services, sourcing from the extra revenue which a booming sector generates. Moreover, both effects might occur and lead to a real appreciation. To picture the general trend, two perspectives, total output in the economy and industrial production were analyzed.

The peak of the revenue of the State Oil Fund of Azerbaijan was 11.6 billion USD in 2011 (Figure 3). Starting from the same year (2011) the share of oil tradable sector in the total output production started to decline – from 40.4% in 2011 to 23.2% in 2015 and 29.1% in 2017 – giving away its growth status to the non-tradable sector (Figure 7).

Furthermore, as can be observed in Figure 7, consistent with the Dutch disease hypotheses, the non-oil tradable sector did not achieve solid growth between 2005 and 2017, while non-tradable sector showed a sharply increasing trend after the oil revenue boom. During the oil revenue boom period, 2007–2011, transfers from the windfall fund to the state budget also increased, and non-tradable output grew to 59% in 2015. This aspect supports the statement related to spending effect which is the result of government expenditures sourcing from the boom.

Figure 7 Share of the sectors in total production output, 1999–2017
(% of total output)



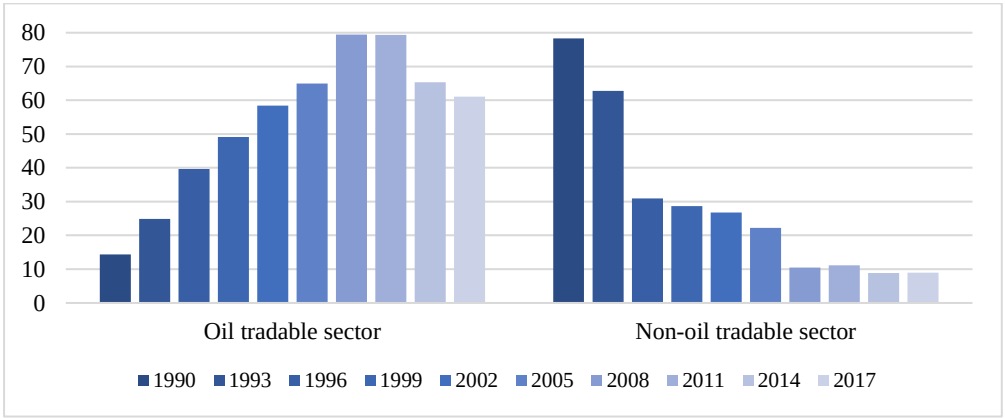
Note: The data for non-oil tradable sector also incorporates agriculture, forestry, and fishery data.
Source: Own construction based on SSCRA (2019f) data

The picture gets clearer when we consider oil tradable sector and non-oil tradable sector against the background of industrial production over a longer time range. From Figure 8 we can observe a stable increase of oil tradable sector starting from 1990 until 2008–2011 period, which is almost 80% of all industrial products, while non-oil tradable sector after the oil boom bottomed out at 9% in 2017. Considering the fact that the data related to non-oil tradable sector encompasses manufacturing value added, excluding such activities like the manufacture of refined petroleum products, chemical industry, and electricity, gas and steam production, distribution of supply, the argument of output de-industrialization of non-oil tradable sector does not seem so far-fetched.

Figure 9 shows the output growth rates and the real exchange rate appreciation starting from 2006. Dutch disease is a phenomenon of a country's chronic exchange rate overvaluation resulting from the discovery of cheap and abundant resources (Bresser-Pereira 2013). We saw that in Azerbaijan's case it was not exactly "the discovery" but a preference for oil tradable sector during and after the painful transition process. Fast transferal of the natural resources to the international markets attracts huge revenue and capital to the economy. Surveyed literature from Magud and Sosa (2013) showed forty-one studies which supported that Dutch Disease led to the appreciation of the national currency while only eight research studies contradicted this. At the same time, the authors indicated that thirty-one investigations

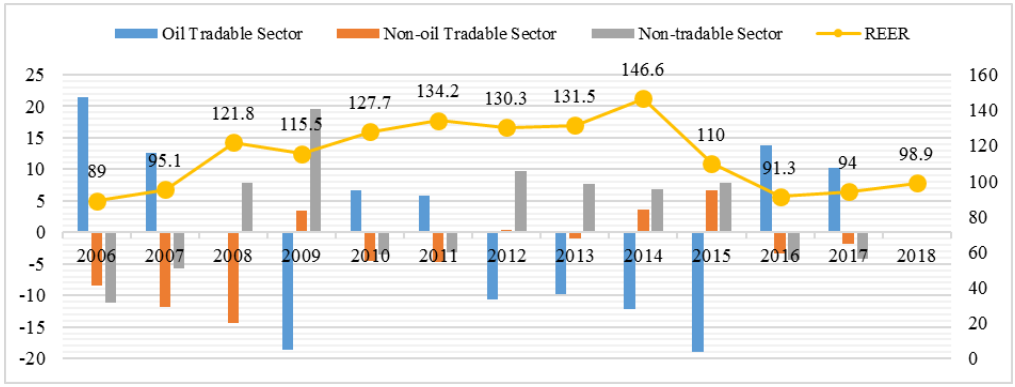
defended the thesis that natural resource revenue and capital inflow booms cause appreciation while opposite views were found seven times less. It is consistent with the case of Azerbaijan because, until the "low oil price" era of 2014–2015, overvalued national currency reinforced economic growth led to the highest GDP growth rates since independence from the USSR (34.5% in 2006). However, following the commodity price downturns, the economy showed national currency devaluations, banking bankruptcies, and declines in growth.

Figure 8 Share of the sectors in industrial products, 1990–2017
(% of total industrial products)



Source: Own construction based on SSCRA data (2019g)

Figure 9 Output growth (total output) in %, compared to the previous year, Real Effective Exchange Rate (right axis) (base year: 2000), 2006–2018



Sources: Own construction based on SSCRA (2019f) and Central Bank of Azerbaijan data

Figure 9 illustrates three main periods (2006–2008, 2009–2014 and 2015–2018) related to the annual output growth compared to the previous year among the economic sectors.[5] During the first period between 2006 and 2008, only oil tradable sector performed positive growth rates while both non-oil tradable sector and non-tradable sector indicated negative output performance. From Figure 3 we can observe that in 2008 year the revenue of the State Oil Fund increased 372.72 % compared to the previous year, and during the same year the real exchange rate overshoot was by 28%.

In the second period from 2009 until 2014, the most vulnerable sector in terms of output growth declines was oil tradable sector, dropping to –18.6% in 2009. Generally, between 2004–2011 years production and exports continuously rose in the oil and gas sector. However, coinciding with the global financial crisis, crucial oil and gas extraction projects were finalized in 2009. So, starting from 2011 oil production and exports declined due to the reductions in the outcome of the main oil and gas extraction project "Azeri-Chirag-Deepwater Gunashli." In the same period, non-oil sector did not show notable growth rates while non-tradable sector performed positively during 2012–2014. The appreciated position of Azerbaijani Manat did not create an export-friendly environment for economic agents, on top of which the spending effect of Dutch disease showed itself in increased share of non-tradable sector's outcome (Figures 7 and 9).

The third period draws attention to the sharp devaluation of the national currency and decreases in oil price. First, the oil price dropped to approximately 53$ in 2015 from almost 99$ in the previous year. Subsequently, the price effect influenced oil tradable sector's output pushing it down to –18.9% in 2015, however, non-oil tradable and non-tradable sectors performed solid output growth by 6.6% and 7.9% respectively. Second, for the years 2016 and 2017, the output of oil tradable sector was 13.8% and 10.2% respectively. This can be interpreted as additional stimulus of the main players of oil and gas industry because of the extension of the "The Contract of the Century"[6] which determined the main production and export patterns of the industry. Accordingly, the work from Hasanov and Samadova (2010) introduced the relationship between the real exchange rate and non-oil exports. The research indicates that a 1% appreciation of real exchange rate leads to a 1.63% decrease in non-oil exports in real terms and 1.46% decline in non-oil GDP in the long-term. However, in the short-term, a 1% appreciation of the real exchange rate leads to a 4.18% and 3.89% decline respectively among the aforementioned indicators.

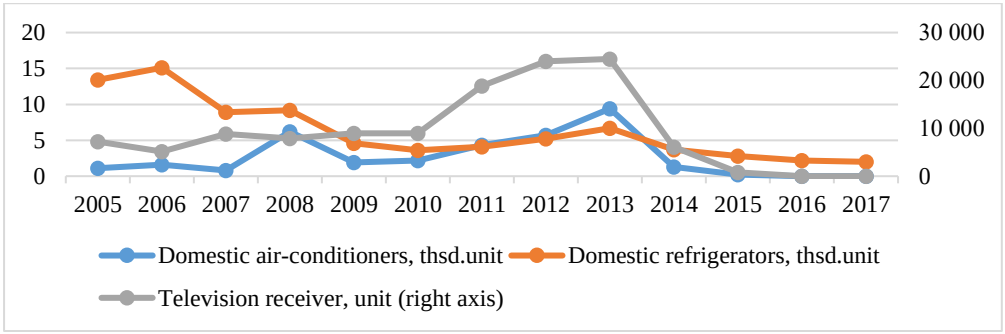
Figures 10 and 11 describe the most vulnerable sub-sectors of the non-oil tradable sector in output to de-industrialization during the oil boom period. For example, Figure 10 is a good contrast between the old and new manufacturing value-

[5] As there is not a precise trend on the graph, the author divided the timescale into three conditional periods to shed light on the adopted research questions.

[6] "The Contract of the Century" drawn up in 1994 between Azerbaijan and eleven of the biggest oil companies from eight countries, was the first project among the post-soviet countries attracting a huge amount of western multinational investments.

added sectors. Still in Soviet years, Azerbaijan was the first union country where domestic air-conditioners started to be produced. The factory was opened in 1975 in Baku, under license from Toshiba. The production capacity was 425–430 thousand units (Bulanova 2019). According to the available data, domestic air conditioners witnessed slight increases during 2008–2013, however, in 2014 production bottomed out at 1.3 thousand units, which are just 0.3% of the possible capacity. The main reason why the revival of this production line has not been organized is related to the Soviet union's production traditions. In other words, during its period of operations, the air conditioners were constructed from imported finished components from various other union countries. Consequently, the collapse of USSR and not having appropriate government policies supporting manufacturing during the 90s and the oil boom period led to a sad ending. A worrying drop happened in the domestic refrigerators output too. Output fell from 15.1 in 2006 thousand units to 2 thousand units in 2017. During the aforementioned years, the appreciated national currency highly hindered domestic production. In contrast to the indicated sectors, production of the television receivers was a new industry in Azerbaijan, however, the output data clearly shows that despite remaining stable until 2013, the trend did not continue for long, leading to noticeable decreases. Also, there is no official data yet for the years like 2016 and 2017.

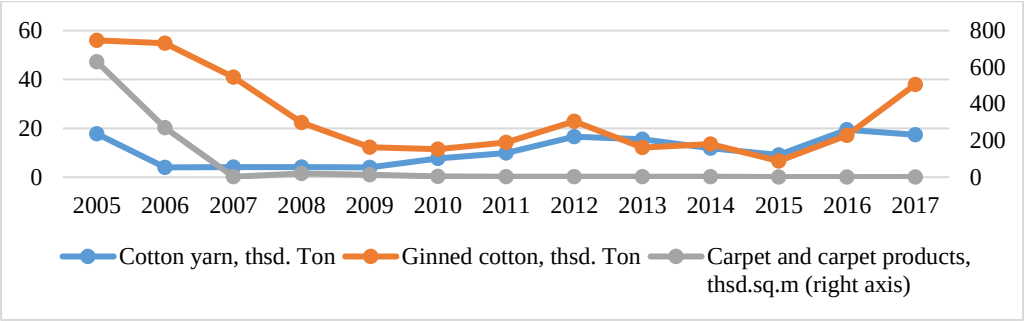
Figure 10 Television receiver, domestic air-conditioner, and domestic refrigerator productions, 2005–2017



Source: SSCRA (2019h)

From Figure 11 the overall impression reveals that output de-industrialization happened in the traditional manufacturing fields like cotton yarn, ginned cotton, and carpet production. Ginned cotton experienced a more detectable reduction in output terms, falling from 56 thousand tons in 2005 to 6.6 thousand tons in 2015. The only rise was during 2015–2017 surging to 37.9 thousands of tons in 2017, which is related to changes in the agriculture policy of the state. During the same time period, the output of carpets and carpet products fell by 99.9% in 2016 compared to 2005. Thus, it was an insignificant increase in the output of carpet and carpet products in 2017, by 0.4 thousand square meters. The main reason of de-industrialized carpet production can be viewed as a consequence of the withdrawal of state investments in the industry.

Figure 11 Production of cotton yarn, ginned cotton and carpet and carpet products, 2005–2017



Source: SSCRA (2019h)

4.3. Trade De-industrialization

Figure 12 illustrates export de-industrialization of particular value-added manufacturing sectors and the trends in agriculture and livestock export patterns from 1994 until 2017, while Figure 13 depicts import patterns of the same sectors of Azerbaijan. Figure 12 shows that some of the sectors underwent considerable export de-industrialization. For instance, textiles sector suffered the highest percentages during 1994 to 1998 (min. 9.2% – max. 19.5%) which started to fall from 1999 (2.9%) and bottomed out at around 0.1% in 2008.[7] Between the 2008–2017 period, a gradual increase was observed and the highest share was 0.6% in 2017.

The same fate was shared by machinery and mechanical appliances, electrical equipment and apparatus category as well, even though it fell significantly right after 1994 from a 13.7% share to 3.8% in 1999. After 2000 machinery and mechanical appliances, electrical equipment and apparatus category showed fluctuations but downsized to a historically low indicator – 0.1% in 2008. In 2017 the share of the category was 0.4%.

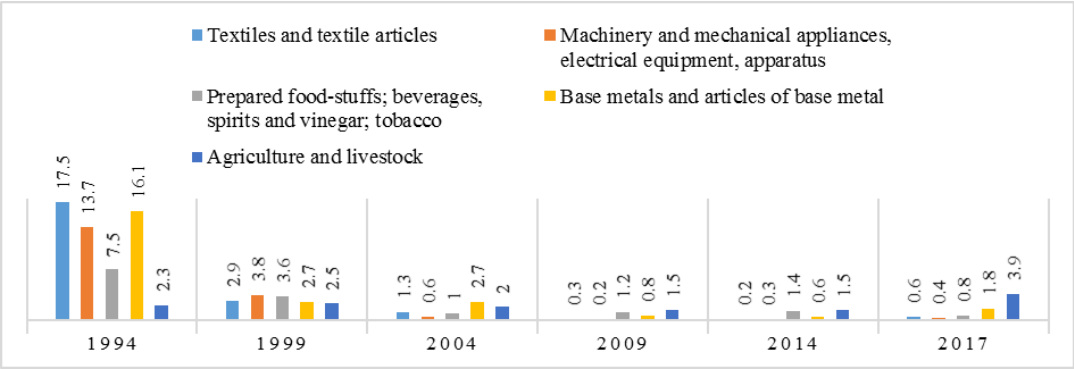
The overall downward trend occurred in prepared foodstuffs, beverages, spirits and vinegar, and tobacco (hereby food production). While exports declined from 7.5% in 1994 by 6.7% in 2017, the imports experienced gradual increases and fluctuations after 2004 (Figure 12). Agricultural exports shared a 2.5% portion of exports in the late 90s but after declines, they reached 3.9% in 2017. As can be seen from the "employment de-industrialization" section of this paper, employment in the agriculture sector did not witness a dramatic collapse, however, a large proportion of

[7] Because of the long time series data, some of the years mentioned like 1993, 1994, 1995, 1996, 1997 and 2008 were not depicted in order to gain cleaner data visualization, however, indicated verbally to show the important signals. This aspect also was mentioned on the data source and methodology section of the paper.

the population is employed in this sector – 36.35% in 2017. Naturally, the increasing value added should be expected in exports.

Against the background of the aforementioned trade (export) de-industrialization, the extension of the Agreement of the Century - New Contract of the Century, until 2050 is the solid example of how the oil and gas sector plays an influential role in the economic policy of the Republic of Azerbaijan, and will continue its supremacy during in the near future. Thus, besides the oil and gas sector, other industries and especially, the manufacturing sector did not exhibit industrialization patterns after independence as can be be appreciated in Figures 7 and 8. In contrast to this, since 2000, the "mineral fuel, lubricants, and similar materials" category in the exports have dominated at 80%; peaking in 2008 at 97.1%, and continuing its dominance until 2017 by 89.5% (SSCRA 2019i).

Figure 12 Trade de-industrialization of Azerbaijan, 1999–2017
(% of the total exports)



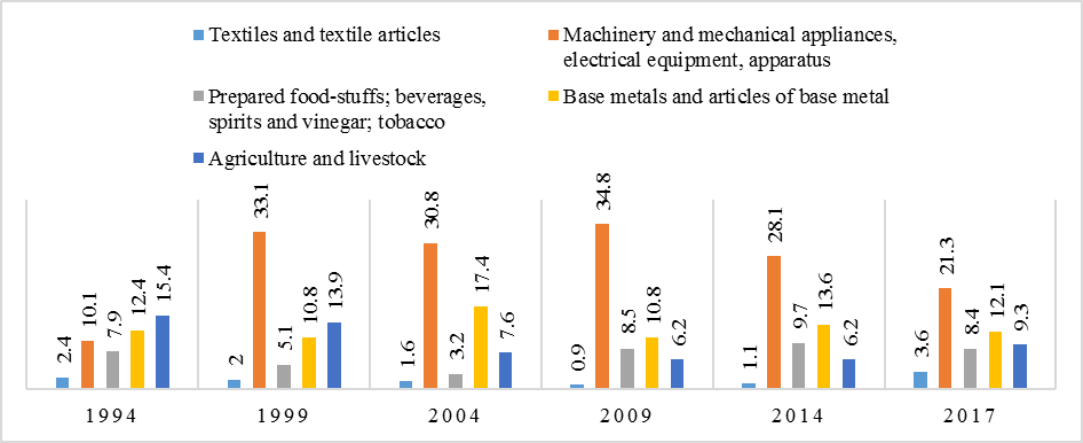
Source: SSCRA (2019j)

Consistent with the de-industrialization literature, some of the abovementioned categories showed import growth rates according to Figure 13. For instance, disease, an increase in the non-tradable sector's share in GDP. A similar conclusion was drawn from the investigation of Gurbanov et al. (2017). The authors argued that despite fiscal regulations and oil revenue management practices of SOFAZ, the production of industrial products had declined. Moreover, despite massive government expenditures and because of high volatility, those expenditures were not to serve as a fuel in non-oil production.the biggest category was machinery and mechanical appliances, electrical equipment, and apparatus, which had a high export share between 1994–1999 but due to the turndown started to be imported heavily from 1999 – 33.1%. The other categories depicted in Figure 13 had higher import shares compared to export shares during the given period.

One could blame so-called "transition effect" of the transition period among the post-soviet economies starting from the early 90s, however, Hasanov (2013) indicated that transition effect did not play as statistically significant a role in the

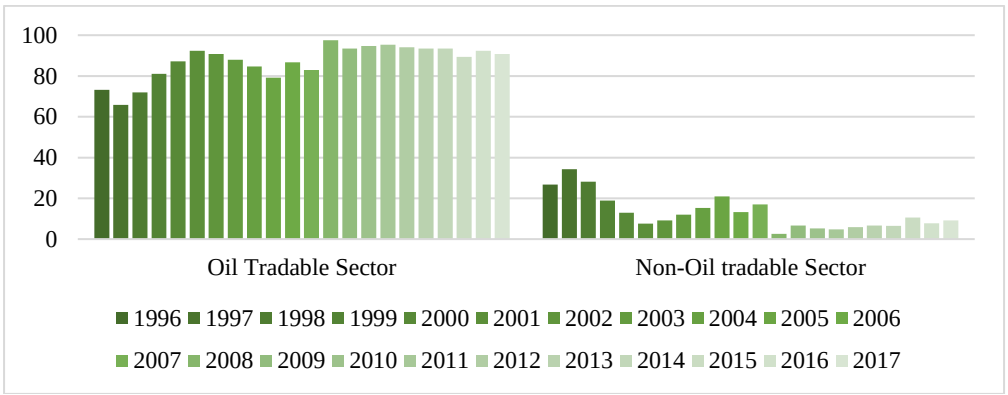
process of relative de-industrialization as did oil price as a proxy of the oil sector. He defended the thesis that the Dutch disease theory is an actuality for the Azerbaijan economy because of relative de-industrialization observations in the non-oil tradable sector, and quite naturally for Dutch

Figure 13 Trade de-industrialization of Azerbaijan, 1994–2017 (% of total imports)



Source: SSCRA (2019k)

Figure 14 Trade de-industrialization of Azerbaijan, 1996–2017 (% of total exports)



Source: Own construction SSCRA (2019k)

To sum up the trade de-industrialization aspect of this paper, Figure 14 illustrates how the share of oil tradable sector and non-oil tradable sector changed over 1994–2017 period considering the export data of Azerbaijan. The share of oil tradable in total exports achieved continuous growth until 2001, from 73.2% to 92.4%, however, starting from 2002 it gradually declined to bottom out at around 79.1% in 2005. After 2008 oil tradable mostly remained steady with slight downturns around

2015. This is because of the stabilization of the biggest oil and gas projects. We start to see a striking difference between oil tradable sector and non-oil tradable sector after 2007. For example, 97.5% for oil tradable sector compared to 2.5% of non-oil tradable in 2008. Two big periods explain non-oil trades: the first period, 1996–2007, when the highest share was 34% and the lowest share was 7.6%. The second period which started with the historically low indicator – 2.5% against 97.5% oil tradable sector in 2008 and moderate rises to 10.6% and 9.2% in 2015 and 2017 respectively. To conclude, trade data clearly indicates the de-industrialization pattern of non-oil tradable sector, especially overlapping with the oil revenue boom year period like 2008–2014.

5. Examination of Government Goals and Programs and Policy Measures

The national government always considered effective revenue management and diversification actions; however, most of them were mainly political tools on the eve of elections. It became clear especially in 2014–2015 that dependence on oil prices and revenue raised many challenges for the Azerbaijani economy. The Global Financial Crisis in the 2008–2009 period and recent downturns in oil prices influenced GDP growth, inflation, investments, and sectoral outputs. In fact, the non-oil tradable sector experienced negative growth rates between 2006–2009. Sharp drops in oil prices in 2014-2015 created severe external shocks for the Azerbaijan economy. Weak macroeconomic foundations and oil dependence of the economy influenced the country's financial sector immediately, leading to double-digit inflation, less oil revenue, and a decline in industrial output (Ibadoghlu et al. 2013). In 2017, GDP fell 45.8% compared to 2014, whereas GDP per capita in PPP declined from $17,926.7 USD to $17,453 USD (2016). Furthermore, the budget deficit was –1.6% in 2017; however, in 2014 the indicator was –0.5% (State Oil Fund of the Republic of Azerbaijan 2017). While the real effective exchange rate was decreasing, the output of oil tradable fell by 12.2% and 18.9 % in 2014 and 2015 respectively. Drops in non-oil sector and non-tradable sector followed this trend during 2016 and 2017 (Figure 9). For these reasons, we can observe some comprehensive and multidimensional strategic approaches of the national government level starting in 2016.

5.1. Examination of Government Goals and Programs

During the years of oil revenue boom, we do not observe any noticeable non-oil tradable sector associated policy mechanisms. A "Long-Term Strategy for the Management of the Oil Revenue" was adopted to identify the main principles of oil revenue management and the middle-range cost policy in 2004. Only in 2011 was "Azerbaijan 2020: Outlook Into The Future" Concept of Development provided to shape a strategic approach based on the current opportunities and resources and attain a stage characterized by sustainable economic growth and high social welfare. The other pre-crisis policy was "State Program on the Development of Industry in the Republic of Azerbaijan in 2015–2020" in 2014. The program aims to increase the

competitiveness of the overall industry by upgrading its structure and increasing non-oil GDP. Involvement of science, innovation, and human capital development are the main objectives of the state program. However, following the years 2016 and 2017, the non-oil tradable sector did not exceed the 2014 results in terms of almost all three industrialization levels (employment, output, and trade). Nuri Aras et al. (2016) and Bulut and Suleymanov (2012), indicated that government expenditures and investments are measures against Dutch disease in Azerbaijan, however instead of improving the performance of lagging sectors and increasing the observable outcome of the "2015–2020 State Program on Industrial Development", government spending and investments, raised the relative price of non-tradable sector, leading to indirect de-industrialization.

After the 2014–2015 period, the most important policy response was the Strategic Roadmap for the National Economic Outlook of the Republic of Azerbaijan in 2016. The document considers twelve strategic roadmaps in eleven sectors of the economy and makes responsible, appropriate policies for the identified targets. Establishment of the Legal Entity of Public Law Center for Analysis of Economic Reforms and Communication was another crucial step to build a holistic framework for the application and monitoring of the policies. The establishment aims to ensure transparency and agility by creating and supporting additional regulations for securities markets, investment funds, banking, and insurance, as well as payment systems, to respond to the recent developments in the world economy. Furthermore, the creation of the Financial Stability Committee aims to minimize the effects of sharp decreases in oil and gas revenue considering the volatile nature of commodity exports. It takes advance steps to protect the negative influences of the global crisis in the mid and long-term periods. Meanwhile, various other policy actions like "Additional Actions to Investment Promotions", "Additional Measures on Promotion of the Non-oil Products" and "The Cancellation of the Inspections in Entrepreneurship" have been made in order to minimize the effects of future commodity price shocks mainly via non-oil tradable sector.

Additionally, among the policies implemented, the Regional State Development Program of the Azerbaijan Republic on Economic and Social Development stands out. It included the years 2004–2008 and 2009–2013, 2014–2018. The new program was approved recently by the president of the country and has included the period of 2019–2023. The main focus of these programs is regional development. It aims to improve such objectives as increasing local production, enhancing entrepreneurship potential, increasing employment, and stimulating exports-oriented production. On the last decree, it was mentioned that more than 2 million new workplaces were provided, of which 1.5 million are permanent positions. Nonetheless, according to the official state statistics, both oil and non-oil tradable sector on employment, output and trade level witnessed downsizing. This is especially inconsistent with the targets and objectives of the indicated policy responses before and after the low oil and gas price era of 2014–2015. After such comprehensive policy mechanisms and non-oil development initiatives, the rural regions of Azerbaijan are still underperforming. According to the year's data from 2017, the three largest

sources of household revenue are, free farming – 29.3%, patronage – 18.1%, and pensions – 15.5%, while the private sector is 4.2% and agriculture is only 0.4% of household revenue (SSCRA 2019l).

We have seen certain state development programs targeting specific sub-sectors of manufacturing in order to respond to such severe de-industrialization process. For instance, the "State program on carpet weaving art and development in the Republic of Azerbaijan for 2018–2022 years" was adopted to improve the export potential of carpet products by upgrading human and physical capital of the sector. The other policy is related to cotton production – "State program on development of cotton growing in the Republic of Azerbaijan for 2017–2022 years" which targets export-oriented production with innovative infrastructure. It also demands the necessary institutional and legal regulations in this sphere. This is the first time after independence that specific manufacturing sectors like the production of the carpet and carpet products and cotton have become an object for the development program. More recent policy and institutional activities involve the establishment of the Social Research Center and Ensurement of Innovative Development (which aims to systematize innovation infrastructure and coordinate the relationship among the important government institutions like National Academy of Sciences, Ministry of Finance, Ministry of Economy and etc.).

5.2. Examination of Policy Tools and Measures

This sub-chapter analyzes two important and concrete policy tools related to oil revenue management aside from the abovementioned government goals and programs. In a chronological order, the first policy tool is the devaluation of the national currency in 2015, and the second policy measure is the adoption of the fiscal framework which covers the stabilization mechanism of transfers from the State Oil Fund, regulation of middle-term expenditures and a strategy for government debt management in the Azerbaijan Republic in the middle and long-term in 2018.

Because of its heavy reliance on oil tradable exports, the economy of Azerbaijan is utterly dependent on the oil revenue. As Bayramov and Abbas (2017) noted, Azerbaijan's GDP performance dropped by 5.8% to 2.8% in 2014 and then to 1.1% in 2015 as the latest petroleum crisis led to a substantial recession. In addition, earnings in the 2014 budget decreased from US$ 23.6 billion in 2014 to US$ 16.9 billion. In 2015, 60% of the entire budget was sourced from the State Oil Fund of the Republic of Azerbaijan amounting to US$ 10.2 billion. Therefore, the painful oil shock of the sharp commodity price downturns in 2014 and 2015 led to the adoption of certain policy measures. The Central Bank of Azerbaijan identified the new fixed exchange rate of US$ to AZN as 1.05 AZN on 21 February 2015 (Statement of the Central Bank 2015a). The Central Bank of Azerbaijan declared "a floating exchange rate" and a second devaluation on 31 December 2015 as 1 US$=1.5610 AZN (Statement of the Central Bank 2015b). According to The Central Bank of Azerbaijan, this action created more maneuvering capabilities for the government to adapt the value of the national currency according to oil prices. Furthermore, such a policy tool

is commonly seen to overcome the competitiveness issue of the tradable sector. In Azerbaijan's case, there was a rational explanation why the government used this policy measure, however, following that year (2015) 15 banks closed because they could not meet the necessary capital requirements and still the floating exchange rate regime is not adequate for the economy. Hence, it is extremely important to evaluate this policy tool in a brief way of pros and cons from the international literature perspective.

The role of exchange rate manipulation or currency devaluation is a controversial topic. The orthodox opinion has defended devaluation as serving a beneficial and significant purpose in stabilizing the equilibrium of transactions (through its cost-switching impacts and enhanced tradeable outputs), while the New Structuralist School has noted that exchange-rate adaptation has contractionary impacts (Agenor 1991). For example, Corsetti et al. (2000) emphasized the positive impact of competitive devaluations. In Azerbaijan's case, the devaluation of 2015 was not solely caused by the decision related to increasing competitiveness, however, the general welfare mechanism can be considered the same. Moreover, considering Bhalla (2008) work, investment activity and economic growth can be explained by the currency undervaluation, because devaluation promotes economic growth while the opposite harms the growth. In contrast, there are several nuances to the national currency devaluation which makes it highly uncertain policy tool. Mironov (2015) indicated that the outcomes of the undervalued or balanced exchange rate can be different on output and certain macroeconomic indicators and overall economic growth. It is a very important policy implication for the decision-makers in the government. Economists have always reserved a certain level of skepticism for the effect of national currency devaluation, supporting their claims by empirical analysis. An early indication came from Krugman and Taylor (1976) emphasizing the risks of devaluation for developing countries because of the high probability of structural reforms failing. Similarly, the contractionary effects of devaluation on output were identified by Edwards (1985) analyzing the effect of the real exchange rates on real output growth in a group of twelve countries between 1965–1980. The research for the given years provided the insight that in the short-run devaluation was contractionary and after one year it may have an expansionary effect, however, in the long-run it has no effect on output. Also, as Mironov (2015) summarizes, devaluation is a country-specific phenomenon always highly sensitive to the tools used against the background of degrading credit ratings, slowing investment activity and bearing a high risk of creating inflation. Thus, this policy tool requires a broader time range to observe its consequences.

The second policy tool is the adoption of the "New Budget Policy"[8] to regulate government spending to overcome the high-level dependency on the oil

[8] This is an umbrella term used among experts in Azerbaijan. There is no official document which names these policy measures as described here. Due to the reason that there are several parts and stages (some

revenue. It means putting certain qualitative limitations on the different parameters of the state budget to overcome the issue, sourcing from short-term based interests of different decision-makers and institutions and prioritizing long-term strategic interests of the national economy. In fact, well-developed budget rules can cushion the blow of the shocks for the macroeconomic institutions, stabilize exchange rate, neutralize inflation and minimize the non-resource revenue deficit of the budget, and it is being used among 80 countries (Eurasia Extractive Industries Knowledge Hub). Accordingly, fiscal rules against the pro-cyclical budget policy were included in Strategic Roadmap for the National Economic Outlook of the Republic of Azerbaijan after the oil price shocks of 2015. In fact, "Strategic Target 1: Empowering Fiscal Sustainability and Adoption of the Sustainable Monetary Policy" under the "Strategic Targets" chapter, strongly emphasized the dependency of the Azerbaijan national economy on oil revenue and formed conceptual foundations of the new multidimensional policy tool. To do so, the adoption of the "Golden Rule" principle was specified to regulate specific parts of the planned fiscal framework. The four main components of this rule are the following: regulation of the transfers of the oil revenue to the state budget, creation of the mechanism of the expenditure and investment discipline, emboldening mid-term expenditure framework and execution of the result-oriented budget mechanism (Strategic Roadmap for the National Economic Outlook of the Republic of Azerbaijan).

As is well known, macroeconomic stability can be threatened considerably by the pro-cyclical budget policy. Unlimited or unregulated government spending may create huge government debt risks for the economy consistent with the Dutch disease theory. To reduce the dependency level of non-oil sector from the resource revenue and to boost its revenue-creation potential, new fiscal rules seem to be important institutional response. So, the general mechanism of the possible fiscal rules covers the necessary qualitative restrictions on the size of public debt, budget deficit, level of spending and volume of income. As the first step towards the "New Budget Policy", Parliament made the necessary amendment to the "Law on Budget System" on June 29, 2018 (Eurasia Extractive Industries Knowledge Hub). The changes cover the following: firstly, the upper limit of each following financial year's consolidated budget spending may not exceed 103% of the previous year's approved spending. Secondly, so-called the "Golden Rule" for the spendable oil revenue has to be calculated. The mechanism is the following:

- First, 30% of the difference between the net financial assets and forecast oil revenue for the predicted budget year must be derived;
- Second, 20% of the obtained difference must be calculated;
- Third, the number found on the second step has to be summed with the least indicator among the abovementioned two.

still ongoing) of this policy measure, evaluating it is a complex process. For practical purposes, occasionally this term will be used in the necessary places.

Secondly, sounding with fiscal rules, certain regulations will address budget discipline. Briefly, budget discipline simply tries to enhance productivity and sustainability of expenditure policy based on the "Golden Rule". More effective expenditure policy will facilitate only those projects and expenditures that aim for rational implementation based on profitability and return on investment. So, more concrete and accurate rationale will be required to finance expenditures instead of traditional resource distribution method implemented since independence.

The third element of this conceptual approach is a mid-term expenditure framework which aims to achieve macroeconomic stability, better sustainable economic growth based on fiscal discipline, to prioritize expenditure directions among the sectors sourcing from resource revenue, and to create the preconditions for the measurable budget mechanism (Rules of the Preparation of Middle-term Expenditure Framework 2018). However, this is still an ongoing process compared to the other parts of the fiscal framework and will take several years before the complete application. The lack of the data and insight does not allow us to evaluate its role and perspectives yet.

The last piece of the conceptual approach covers the policy measures that aim to focus firmly on strategic goals and programs instead of conventional expenditure items, to clearly state the expectations of state entities, to design the state budget based on thee identified expectations from these state entities, to create supervision mechanism related to the spending patterns of these state entities, and to form the budget based on the evaluation of the achievement rates and efficiency of the state entities. This last measure has a very high potential to boost the effectiveness of state budget expenditures on the institutional level if applied transparently.

Some associated opportunities and risks related to the new fiscal framework should also be noted at this point. Surely, limiting the transfers and the spending sourced directly from oil revenue might create a better transition to countercyclical policies, while reducing state debt might lead to better macroeconomic stability. However, this policy tool still does not guarantee lower dependency on oil revenue, and it does not provide the necessary insurance for the leverage of savings. The formula is still dependent on the exchange rate and the legal conditions for budgetary law in the fiscal year are rather weak, and the effect of fiscal frameworks can be reduced substantially by periodic disruptions during the implementation of these laws (Eurasia Extractive Industries Knowledge Hub).

6. Concluding Remarks

This study sought to investigate the patterns of the de-industrialization process that happened through the resource movement effect and spending effect of Dutch disease hypotheses in Azerbaijan after independence. In order to do so, two research questions were constructed: Does the employment, output and trade data show the direct and indirect de-industrialization patterns as the result of the resource movement and the spending effect of Dutch disease in Azerbaijan? What are the policy responses of the

national government in response to critical years like 2008–2009 and 2014–2015 to alleviate the primary export-based economy and particularly value-added manufacturing sector from the de-industrialization process?

The main findings were based on the descriptive statistics on three levels: employment, output and trade de-industrialization, as well as three sector level, namely, oil tradable sector, non-oil tradable sector and non-tradable sector. Consequently, despite oil tradable sector is the booming sector of the economy, it showed slight employment decline between 2008 and 2017 (from 1.88% to 1.31%) but considerable output falls starting from 2011 (from 40.4% to 23.2% in 2015). However, it greatly dominated in exports starting from 2008 till 2017 by 93% average annual percentage. Consistent with Dutch disease syndrome, the most vulnerable to the direct and indirect de-industrialization were non-booming sectors, in Azerbaijan's case non-oil tradable sector. The employment data shows that agriculture witnessed a 5% decrease while manufacturing value-added sectors like machinery, production of electrical and electron equipment, weaving, and cloth production experienced severe de-industrialization. The non-oil tradable sector did not escape output and trade decrease either. High government expenditures sourcing from the huge foreign currency led to high shares of non-tradable in employment and output.

The national government created more sophisticated policy responses after the "low oil price" era; however, prior considerations concerning diversification and regional developments are not consistent with the statistical data. The economy of Azerbaijan is still dependent on the revenue from crude oil and gas exports and experienced de-industrialization during the 90s and oil revenue boom.

The government of Azerbaijan should consider exactly the certain de-industrialization process as a consequence of Dutch disease hypotheses, so the implementation of solutions for this issue may find its way to the table of the decisionmakers. As a policy response, protection of the traditional value-added sectors like carpet production and cotton production can be observed, however other policy measures aim to regulate oil revenue transfers from the sovereign oil fund and to regulate expenditures in short and middle term. Surely, it will lead to better environment for the non-state investments but carry associated risks alongside specific approaches which have to be considered. Finally, exchange rate policies should be developed to protect foreign trade structures and regulate competition-related issues.

Value-added manufacturing and in the case of Azerbaijan, the non-oil tradable sector is vitally important to stable economic growth during fluctuations in the international commodity markets. Starting from the beginning of the twentieth century, many studies have supported manufacturing led growth hypotheses. Even in today's world, under the dominance of the services sector, the manufacturing sector is crucial for the evolutionary path of a country's economy. Subsequently, the de-industrialization process, namely shrinkage of employment, output, and trade in the value-added manufacturing or in other sectors lead to the structural changes. The phenomenon gets even more important in the case of post-soviet and transition countries. Dutch disease hypothesis is one of the theoretical models which explain de-

industrialization through the booming and lagging sectors. Thus, the symptoms of Dutch disease can be observed in the Azerbaijan economy through main trends in the booming sector, non-oil tradable sector, and non-tradable sector. Appropriate policy measures also must follow economic policy decisions in a direct and clear way addressing the institutions and economic agents of the national economy.

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