PHD DISSERTATION

Ibrahim Niftiyev

Szeged, 2022

UNIVERSITY OF SZEGED FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION DOCTORAL SCHOOL IN ECONOMICS

DUTCH DISEASE-LED DE-INDUSTRIALIZATION IN THE AZERBAIJAN'S ECONOMY: ANALYSIS OF THE CHEMICALS INDUSTRY

Phd Dissertation

Supervisor:
Prof. Dr. Miklós Szanyi
Institute of Finance and International Economic Relations
Division of World Economics and European Economic Integration

Author:
Ibrahim Niftiyev
University of Szeged
Faculty of Economics and Business Administration
Doctoral School in Economics

Szeged 2022

DECLARATION

Candidate's Declaration

I (Ibrahim Niftiyev) hereby declare that the dissertation of this PhD studies is my original research work and was written by myself under the guidance of my supervisor. This dissertation has not been presented elsewhere for any other degree, award or professional qualification. There is no collaborative or jointly owned work in this thesis, whether published or not. I dulycited all the external sources, published works (i.e., books, research papers, reports) and data sources in the given place in the text.

Candidate Signature: .... Date: 2022.08.26

Name: Ibrahim Niftiyev

Supervisor's Declaration

I, Miklós Szanyi, hereby declare that the dissertation written by Ibrahim Niftiyev, entitled (title of the thesis) is his own written work prepared under my supervision. Based on its professionalmerits, I support its submission.

Principal Supervisor's Signature:

Name: Prof. Dr. Miklós Szanyi Date: 2022.08.16

LIST OF PUBLICATIONS

The dissertation is based on the following papers of the author:

Niftiyev, I. (2020). Dutch Disease Symptoms in Azerbaijan Economy. *Journal of Economic Cooperation and Development*, 41(3), 33–66.

Niftiyev, I. (2020). The De-industrialization Process In Azerbaijan: Dutch Disease Syndrome Revisited. In Proceedings of the 4th Central European PhD Workshop on Technological Change and Development (p. 357–396). Szeged: Faculty of Economics and Business Administration, Doctoral School in Economics, University of Szeged.

Niftiyev, I. (2021). Dutch Disease Effects in the Azerbaijan Economy: Results of Multivariate Linear Ordinary Least Squares (OLS) Estimations. *HSE Economic Journal*, 25(2), 309–346. DOI: https://doi.org/10.17323/1813-8691-2021-25-2-309-346

Niftiyev, I. (2021). How to Conceptualize the Resource Curse and Dutch Disease Theories in the Case of Azerbaijan? Initial and Negative Findings. *SSRN Electronic Journal*. Available at: https://ssrn.com/abstract=3857936. DOI: https://doi.org/10.2139/ssrn.3857936

Niftiyev, I. (2022). A comparison of institutional quality in the South Caucasus: Focus on Azerbaijan. In Proceedings of the European Union’s Contention in the Reshaping Global Economy (pp. 146–175). Szeged: University of Szeged, Faculty of Economics and Business Administration, Doctoral School in Economics. DOI: https://doi.org/10.14232/eucrge.2022.9

Ibadoghlu G., & Niftiyev I. (2022). A Retrospective Analysis of the Azerbaijani Economy During 30 Years of Independence. *Post-Soviet Issues*, 9(1), 58–76. DOI: https://doi.org/10.24975/2313-8920-2022-9-1-58-76

Ibadoghlu G., & Niftiyev I. (2022). An assessment of the thirty year post-Soviet transition quality in Azerbaijan from an economic and social liberalization perspective. *Journal of Life Economics*, 9(3), 129–146. DOI: https://doi.org/10.15637/jlecon.9.3.02

Niftiyev, I. (2022). Principal component and regression analysis of the natural resource curse doctrine in the Azerbaijani economy. *Journal of Life Economics*, 9(4), 225–239. DOI: https://doi.org/10.15637/jlecon.9.4.02

ACKNOWLEDGEMENTS

Doctoral studies have been an important part of my life since 2017. This dissertation and my other completed research would not have been possible without certain people and institutions that have accompanied, supported, and guided me on this long but life-changing journey.

First and foremost, I would like to thank Prof. Dr. Miklós Szanyi, from whom I learned what it means to be a good social scientist. I am very grateful to him because after consultations and discussions with him, I was able to shape my research and achieve scientific results. Second, Prof. Dr. Éva Voszka (Director of the Doctoral School of Economics), who has always guided young PhD students in their research work through invaluable research workshops at the Faculty of Economics and Business Administration. Third, the overall academic environment at the University of Szeged, where research culture meets real challenges, will forever remain in my memory given the numerous professors, lecturers and academic staff. Thanks to this special research and academic culture, which encourages the ambition of budding economists and social scientists, I was able to mature as a social scientist and economist. Finally, I would like to thank Mr. David P. Curley (University of Szeged, member of MTA-SZTE Research Group on Artificial Intelligence) and Mr. Ben McKechnie for proofreading this dissertation and their useful suggestions.

Next, I would like to thank Prof. Dr. Beáta Farkas, who was always deeply interested in my progress, and Dr. Gábor Dávid Kiss, who often and without hesitation helped me in both professional and personal matters. The Dean of the Faculty of Economics and Business Administration, Dr. Péter Kovács, and all the members of the Institute of Finance and International Economic Relations have been extremely helpful and supportive throughout my PhD studies, for which I cannot thank them enough. Finally, I greatly appreciate the evaluations and feedback from Dr. Gábor Dávid Kiss and Dr. Judit Ricz on my dissertation.

My special appreciation goes to my parents, who have always supported me in my life choices, both morally and materially, whenever I needed them. Without the tireless moral support of Mr. Muslum Niftiyev and Mrs. Kamala Niftiyeva (Aghayeva), it would have been almost impossible to complete this dissertation and my other published scientific works. I would like to thank my aunt, Tarana Bakirli, for the countless conversations she had with me to motivate me throughout the dissertation. Thank you for believing in me and always being by my side.

I cannot thank enough my close friends Kamran Javadov, Huseyn Huseynli, Agil Yusifli, Vusal Ahmadov and Ulvi Shakhikhanli who supported me and believed in me. One of my best friends, Eldar Aliyev, who gave his life for his country in 2020, never hesitated to check in with me about my progress and achievements.

I would like to thank the Hungarian government for granting me the Stipendium Hungaricum and the Dissertation Scholarship. I would also like to thank the Ministry of Education of the Republic of Azerbaijan for recommending me for the scholarship program. My sincere thanks also go to the Center on the European Economy (Mr. Elkhan Richard Sadik-Zada), Azerbaijan State University of Economics for the help and support during my PhD studies. Without the support of these institutions, I would never have been able to start and finish my studies. Thank you very much for everything! I will always have the best memories of this part of my life.

ABSTRACT

While the oil boom played a positive role in Azerbaijan's economy by reducing poverty and increasing overall prosperity, the country's industrial structure became lopsided and favored oil and gas production. Typically, the contraction of non-oil tradeable sectors (e.g., manufacturing) in oil-rich countries places an economic and social burden on society. The manufacturing sector can stimulate innovative actions triggered by policy decisions and improve the political and institutional environment. To determine the reasons for the one-sided industrial production, it is crucial to explain Azerbaijan's economy with sound theories and elucidate the largest economic challenges. Thus, the Dutch disease (DD)-related de-industrialization of non-oil manufacturing is the main focus of this dissertation. DD is a form of de-industrialization when natural resources are discovered or commodity prices skyrocket, resulting in unexpectedly high revenues. This situation shifts the attention of resource-rich governments from non-commodity production to commodity exports, motivating them to spend natural resource revenues within a short period of time. However, not all de-industrialization of a particular non-oil sector is likely to be due to an oil boom. The general institutional environment and human capital also play critical roles. DD is a useful theory for explaining why in a small, open, and oil-rich country like Azerbaijan, non-oil manufacturing de-industrialization has occurred in parallel with the oil boom since 2005/06.

For the process of de-industrialization to occur, several conditions must be met. In countries rich in natural resources (e.g., oil and natural gas), the natural resource curse (NRC) and DD may be among the reasons. In advanced countries, this is usually due to productivity growth or globalization. It is therefore logical to analyze the economy of Azerbaijan, which is an oil-rich developing country, within the framework of the NRC and DD. For this reason, a novel, step-by-step explanation of non-oil manufacturing de-industrialization was developed. For a targeted approach, the chemicals industry was selected as a case study.

The first objective of this study was to identify whether the non-economic side of the NRC, namely the institutional part, is indeed applicable to Azerbaijan's economy. This was analyzed using principal component analysis, ordinary least squares (OLS), and dynamic OLS. The statistical methods seemed to confirm that the growth of the oil industry has had a negative impact on the institutional quality and human capital of Azerbaijan's economy.

The second objective was to examine DD effects. This was achieved by applying unrestricted vector autoregression, linear multivariate OLS, and Bayesian vector autoregression models. To capture the resource movement and spending effects of DD in the national economy separately, aggregate models were first estimated.

The third objective was to determine whether the de-industrialization of specific subsectors of the chemicals industry was indeed related to the oil boom. To achieve this, quantitative and qualitative research methods were used. Thus, under a quantitative approach, both short- and long-run linear models were used for estimation (since the Johansen test revealed long-run cointegration between the variables of interest). Stepwise, OLS, fully modified OLS, canonical cointegration regression, and robust least squares were applied. The quantitative results supported the claim that oil- or DD-induced de-industrialization has had a negative impact on chemical industry output in Azerbaijan.

In addition, expert interviews helped to gather qualitative data from industry experts and economists specializing in the industrial side of Azerbaijan’s economy. The interview results not only supported the quantitative findings but also provided additional factors and reasons for the de-industrialization of the chemical subsectors and their ongoing re-industrialization. Examples include rent-seeking behavior that began with the oil boom in 2005; human capital issues associated with labor supply; outdated technology; and the inefficiency of current state-owned enterprises.

The final objective was to provide brief policy suggestions to counteract the DD-related de-industrialization of the non-oil manufacturing sector in Azerbaijan’s economy. This was achieved by bringing together the empirical results of this dissertation and reviewing the literature on exchange rates as well as institutional and industrial policies in different periods. The main policy proposal is to focus on institutional and monetary aspects of the economy to overcome opportunistic behavior and monetary pressures that threaten the competitiveness of non-oil production. The oil boom is negatively affecting the non-oil sectors because of the low quality of institutions and the inability of human capital to cope with the associated challenges. The government's imprudent spending policies and the unrestrained real effective exchange rate require prudent fiscal and monetary policies and developed financial markets to properly manage the absorptive capacity of the Azerbaijani economy. In addition, selective industrial policies combined with tariffs and subsidies can encourage the private sector, and thus the non-oil sectors, to participate in the overall industrial diversification process. These findings are of critical importance to government agencies and official policy makers, who should base their decisions on well-designed economic relationships among key sectors and economic indicators. Future research can focus on other non-oil production sectors besides the chemicals industry and collect qualitative data, as official statistics do not cover the necessary aspects to analyze oil- or DD -induced de-industrialization since 2005 and 2006.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

2SLS	Two-Stage Least Squares
ACG	Azeri, Chirag, and Guneshli
ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criterion
AIH	Azerbaijan Investment Holding
ANB	Azerbaijan National Bank
AR	Auto-Regressive
ARDL	Autoregressive Distributed Lags
AZAL	Azerbaijan Airlines
AZN	Azerbaijan Manat
BICEX	Baku Interbank Currency Exchange
BR	British Petroleum
BTC	Baku–Tbilisi–Ceyhan
BTC	Baku-Tbilisi-Jeyhan
BVAR	Bayesian Vector Autoregressive
CBAR	Central Bank of the Republic of Azerbaijan
CEE	Central and Eastern Europe
CIE	Cancellation of the Inspections in Entrepreneurship
CIS	Commonwealth of Independent States
CJSC	Closed Joint-stock Company
CPI	Consumer Price Index
CPS	Cyber-Physical Systems
CUSUM	Cumulative Sum
CUSUMSQ	Cumulative Sum of Squares
DD	Dutch disease
DOLS	Dynamic Ordinary Least Squares
EBRD	European Bank of Reconstruction and Development
EDI	Extractives Dependency Index
EGDI	E-Government Development Index
EITI	Extractive Industries Transparency Initiative
EU	European Union
FDI	Foreign Direct Investments

FMOLS	Fully Modified Ordinary Least Squares
FSU	Former Soviet Union
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GNP	Gross National Product
GVC	Global Value Chains
HDI	Human Development Index
HDPE	High-Density Polyethylene
HQ	Hannan–Quinn
IBA	International Bank of Azerbaijan
ICTs	Information Communication Technologies
IDA	International Development Association
IFC	International Finance Organization
IFRS	International Financial Reporting Standards
IMF	International monetary Fund
IRF	Impulse Response Function
JBN	Jarque–Bera test
KMO	Kaiser-Meyer-Olkin
KPMG	Klynveld Peat Marwick Goerdeler
LLC	Limited Liability Company
LM	Lagrange Multiplier
MENA	Middle East and North Africa
MNCs	Multinational Companies
MPC	Marginal Propensity to Consume
MSMEs	Micro and Medium-Sized Enterprises
NGOs	Non-Government Organizations
NRC	Natural Resource Curse
OEC	Observatory of Economic Complexity
OECD	Organization of Economic Cooperation and Development
OJSC	Open Joint-stock Company
OLS	Ordinary Least Squares
PCA	Principal Component Analysis

PP	Polypropylene
PU	Production Union
R & D	Research and Development
RCVI	Resource Curse Vulnerability Index
REER	Real Effective Exchange Rate
REER	Real Effective Exchange Rate
RLS	Robust Least Squares
SAC	Structural Adjustment Credit
S_B	Booming sectors
SC	Schwarz Criterion
SCIP	Sumgait Chemical Industrial Park
SDGs	Sustainable Development Goals
SE	Forecast Error
S_L	Lagging sectors
SME	Small and medium-sized enterprises
S_{NT}	Non-tradeable sectors
SOCAR	State Oil Company of Azerbaijan Republic
SOE	State-Owned Enterprises
SOFAZ	State Oil Fund of the Republic of Azerbaijan
SSCRA	State Statistical Committee of the Republic of Azerbaijan
SWFs	Sovereign Wealth Funds
TANAP	Trans-Anatolian Gas Pipeline
TAP	Trans Adriatic Pipeline
TFP	Total Factor Productivity
TOT	Terms of Trade
UK	The United Kingdom
UNEP	United Nations Environment Programme
USD	United States Dollars
USSR	Union of Soviet Socialist Republics
VAR	Vector Autoregressive
VECM	Vector Error Correction Method
VIF	variance inflation factors

WGI	Worldwide Governance Indicators
WTO	World Trade Organization
WUA	Water User Associations
WVS	World Value Survey

CHAPTER 1

RESEARCH BACKGROUND

In this chapter, the research problem and gaps are introduced to conceptualize the purpose and objectives of the current study. Then, the general conceptual framework is presented. This includes the research questions and hypotheses that were established to analyze the collected data as well as the theoretical frameworks used to analyze Azerbaijan's economy. Finally, an outline of the dissertation is presented.

1.1. Research problem and research gaps

Industrialization—particularly manufacturing—has helped developed countries to achieve higher income levels and living standards, especially in the early years of their development (Szirmai–Verspagen 2015). In addition, approximately 80% of developing countries' exports have shifted from commodity extraction to industrial production-based goods since 1960 (Gelb 2010). This shift has created opportunities for low-income countries to participate in global value chains (GVCs)[1] across a variety of sectors. Manufacturing-centered economies increase the complexity of exports and ensure economic prosperity for their citizens. A recent study also demonstrated that the great importance of manufacturing as an engine of economic development has not changed significantly since 1990 (Haraguchi et al. 2017). In other words, manufacturing continues to contribute significantly to the wealth of nations. Yet, the nature of manufacturing itself is changing rapidly in our fast-growing world. For example, increasing digitization has affected the structure of manufacturing and business models, as consumer markets have become smaller and more fragmented but also more interconnected (Paulus–Rohmer 2016). For instance, Brettel et al. (2017) discussed the term "Industry 4.0," proposed by Schwab (2015), as a new term for conceptualizing changes in the manufacturing landscape. In other words, the growth engine of the modern economic world comprises big data-driven cyber-physical[2] systems that enable

[1] "GVC" means value added in the process of design, production, marketing, distribution, and support for the consumer of a product or service where firms and workers perform in inter-firm networks on a global scale (Gereffi–Fernandez–Stark 2011).
[2] Cyber-Physical Systems (CPS) basically mean the management of the physical processes via computer algorithms and the concept of big data basically means the enhanced data collection techniques used in day-to-day activities, storing the data in large and complex data sets that will be used in predictions and forecasting.

modularization through knowledge-based service platforms to identify and satisfy newly emerging consumer demands (Paulus–Rohmer 2016).

In parallel with the development of manufacturing in the world economy, which creates high value-added, the role of the service sector has also increased in many countries. However, without a well-developed industry, the additional benefit of services may remain low. For this reason, since Kaldor's (1960) initial theorization of manufacturing as an engine of growth, much research has focused on industrialization as an engine of growth and prosperity.[3]

However, it is unlikely that every country will benefit from manufacturing (Cantore et al. 2017). With the increasing importance of the globalization process and the reintegration of former centrally planned economies into the world economy, the emphasis since the late 1980s has been on the use of specialization and trade with minimal adjustment costs (Pomfret 2001). The rise of GVCs for weakly industrialized countries could be seen as a push to industrialize production. However, without significant adjustments in domestic productivity, it is likely that less productive countries will remain confined to low value-generating activities for an extended period (Pahl–Timmer 2020).

While some mineral-rich developing countries have achieved economic diversification, other developing countries and mineral- or primary sector-based economies have been less successful; thus, they have received less attention in the literature. Moreover, several economists have argued that long-term sustainable development cannot be achieved in mineral-rich and weakly industrialized countries because they deprive themselves of the positive externalities that manufacturing generates (e.g., learning by doing; Magud–Sosa 2013; Matsuyama 1992; Hausmann et al. 2007). This is why various researchers have consistently emphasized the need to strengthen manufacturing and resource-independent industrialization to sustain economic prosperity (McMillan–Rodrik–VerduzcoGallo 2014; de Vries–Timmer–de Vries 2015).

[3] Kaldor's (1957; 1966) work stressed the importance of manufacturing in economic growth due to the increasing returns that it provides, and it also underlies the importance of demand and the external factors that influence it (see Pata and Zengin (2020), for an analysis of post-World War II England). Also, Kaldor (1957) introduced the technical progress function, which characterizes how new industrial plants increase labor productivity, offer intermediate and capital goods, and improve production techniques. Lastly, Kaldor (1957) mentioned that a country's industrial development boosts domestic demand and external demand, and this also reinvigorates economic growth and development. With these ideas, the economics scholars saw why industry has always been a priority for developed countries.

A country's economic performance and well-being depend on its production and exports (Hausmann et al. 2007). Likewise, Rodrik (2008) argued that rich countries became rich because they produced innovative products and not just traditional goods in abundance. The economic diversification of production activities enables improved growth performance in the long run because it increases the economy's sources of income, contributes to job creation, and leads to balanced development between urban and rural areas (Albassam 2015). Furthermore, the pursuit of mineral extraction and export-oriented economic development creates dependency, which is associated with negative impacts. Examples include real effective exchange rate (REER) appreciation and rent-seeking behavior.[4] However, it is not easy for low-income and developing countries to shift from traditional production to more diverse production habits to increase value-added exports (Hidalgo et. al 2007). Typically, a rapid shift in production methods requires complex policy implementation that leads to structural changes and higher living standards (Hidalgo et. al 2007).

Azerbaijan is a small and oil-rich post-Soviet country. It has rich oil and gas resources and an unbalanced economy; it underwent a painful transition process from a command economy to a market economy in the early 1990s; and it has pursued extractive industry-driven economic development since 1994. As a result, Azerbaijan has a lopsided economic structure that is vulnerable to international commodity shocks, as was the case from 2014 to 2015. The main driver of gross domestic product (GDP) is the oil industry, and the country's main exports are based on crude oil and petroleum products.

Because of the country's overdependence on oil exports and revenues, Azerbaijan's economy has been studied by some using the natural resource curse (NRC)[5] doctrine and Dutch disease[6] (DD). NRC and DD are similar concepts, but they also differ because NRC is a broad term for the theoretical branch of natural resource management. However, the concept of NRC focuses precisely on the economic

[4] The term rent-seeking was introduced by Ann Krueger. Rent-seeking is an economic term that describes a situation in which an entity seeks to acquire wealth without providing anything in return. The term "rent-seeking" is derived from the economic meaning of "rent," which is defined as economic gain obtained through the skillful or possibly manipulative use of resources.

[5] NRC refers to the side effects of economic performance of oil-, mineral-, and other resource-rich countries compared to non-resource-rich countries. However, oil-, mineral-, and other resource-rich countries are considered to have better opportunities to grow rapidly and develop their societies because of available short-term revenue opportunities.

[6] DD is an expression of the contradiction that arises when good news, such as the discovery of enormous oil reserves, harms a country's overall economy. It may have its origin in a substantial influx of foreign capital to exploit a newly discovered resource.

crowding out mechanisms and domestic inflationary pressures of booming sectors over non-booming sectors. In other words, while DD reflects only the economic aspects of NRC, NRC itself is not limited to economic issues of resource dependence, as it also encompasses political, institutional, and governance dimensions. Furthermore, the other aspects of the NRC and DD, such as deindustrialization and de-agriculturalization, have not been studied in depth.[7] The literature still lacks unequivocal arguments on the negative consequences of extractive industry-dominated economic structures in Azerbaijan. This has resulted in both theoretical and practical gaps in guidance for decision makers, policy makers, and academics in how to conceptualize Azerbaijan's economy within a widely accepted and tested theoretical framework. The strong and positive relationship between Azerbaijan's GDP and oil prices, or simply the appreciation of the REER—as claimed in previous studies—is not sufficient to explain why the NRC or DD is solely due to oil wealth. Undoubtedly, the NRC and DD theories should be considered, but the production and export of difficulties in certain sectors of the economy, such as non-oil tradeable sectors (e.g., industrial producers), should also be analyzed. To develop effective and targeted industrial policies that reduce the potentially harmful effects of an oil-based economy, new research should focus on oil-related de-industrialization and industrial diversification in Azerbaijan. If the results provide a clearer picture of the negative consequences of the oil industry's dominance in Azerbaijan's economy, both scholars and policymakers would be able to more effectively shape their policies.

When examining the economy of Azerbaijan, the mere assumption of oil dependence and the need for diversification lead researchers to naively expect signs of the NRC and effects of DD. However, the supposed final theoretical outcome of the NRC or DD is the de-industrialization of nonbooming sectors in terms of output and employment. Therefore, after testing the NRC doctrine and the DD model, this study analyzed Azerbaijan's economy in terms of the de-industrialization of the chemicals industry. The aim was to more accurately capture the negative consequences of oil-based economic growth and development.

[7] This dissertation will mainly focus on de-industrialization; however, the agricultural sector is also an economic priority, as it employs the highest share of the labor force in Azerbaijan. Therefore, some parts of the quantitative analysis will include some data from the agricultural sector.

To date, only a handful of studies (mainly journal articles) have addressed the de-industrialization process.[8] Troubling, yet-to-be-resolved issues are the stage at which oil revenues were misdirected and why Azerbaijan's economy has been unable to develop non-oil manufacturing. Without solutions, research on Azerbaijan's economy will not be specific or relevant enough to provide comprehensive solutions for a more diversified economic structure. In times of low commodity prices, the current industrial structure certainly threatens national income, employment, and the monetary side of the economy. Finally, Szirmai and Verspagen (2015) argued that former centrally planned economies are underrepresented in studies that treat manufacturing as an engine of growth. The present study therefore sought to fill this research gap by extending NRC and DD studies on Azerbaijan.

1.2. Problem statement and study purpose

Lower manufacturing value-added and exports have been demonstrated to have adverse effects on long-term sustainable economic development in mineral-rich countries, such as Nigeria (Schubert 2006), Russia (Bogetic et al. 2006), and Ghana (Acquah-Andoh et al. 2018). If institutional, political, and governance aspects of the economy fail in addition to the economic crowding-out mechanisms of DD, a country is likely to become dependent on a single commodity. This, in turn, will lead to a constrained growth environment for noncommodity tradeable sectors, as one of the main factors determining the competitiveness of a given economy is macroeconomic stability (Khyareh–Rostami 2022). However, monetary pressures and procyclical fiscal policies usually hinder the competitiveness of commodity-rich countries.

Industrialization is often argued to be an engine of balanced economic growth and development, whereas the opposite (i.e., de-industrialization) is allegedly harmful to a country. In any study on the impact of Azerbaijan's oil industry, the country's postcommunist legacy, small size, and de facto oil wealth must be considered as part of the background. Simply assuming that de-industrialization has been a negative development since the collapse of the USSR would not be helpful for furthering knowledge about Azerbaijan's economy. In other words, resource-poor countries have no other option than industrialization through their manufacturing sector. Meanwhile, mineral-rich countries tend to use their available natural resources in the short term to

[8] See Hasanov (2013) for a brief consideration of "relative de-industrialization" and Niftiyev (2020a) for a more focused but descriptive argument against de-industrialization.

avoid painful reforms and changes. In Azerbaijan, the decreasing role of the manufacturing sector and the related structural changes can be attributed to oil.

In this dissertation, the research design and main theses were based on the idea that the de-industrialization process of Azerbaijan's economy since 1995 has been an extension of the NRC doctrine and its economic explanation (i.e., DD). This is not the first study to examine the NRC and DD in the case of Azerbaijan; rather, it was motivated by recent developments in Azerbaijan's economy, such as decreased GDP, devaluation of the national currency, and increased domestic price levels. These developments followed the volatility in international commodity markets in 2014 and 2015. The threats posed by volatile oil prices appear to be caused by the low diversification of Azerbaijan's economy and poor oil revenue management. Therefore, the relevance of oil-related adverse effects in booming sectors was studied using both quantitative and qualitative research methods.

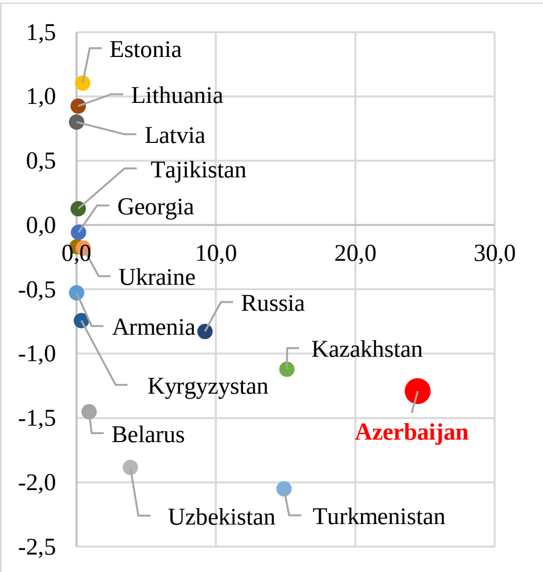
1.3. Justification of the study

The case of Azerbaijan provides a unique opportunity to deepen the studies of NRC and DD to get a complete picture of the negative impact of the lopsided industrial structure on the rest of the economy. The end of the oil boom (as measured by oil prices) in 2014 had a devastating impact on Azerbaijan. GDP per capita fell from $7,891 in 2014 to $5,500 and $3,880 in 2015 and 2016, respectively, but all of this was due to inefficient management of oil revenues, which various international economists and experts had warned about since 1995, when the economy entered the recovery phase. Some other post-Soviet countries (e.g., Russia and Kazakhstan) share the same fate, but their GDP per capita and its recovery in the post-boom period (between 2015 and 2020) were higher. Moreover, oil prices have been rising rapidly from the end of 2021 (the end of the major pandemic waves of COVID-19) and February 2022 (the beginning of the Russo-Ukrainian war), leading to higher oil revenue expectations. These facts point to the contextual limitations of the previous studies, in which changing external factors (such as the oil price decline and GDP collapse) were not adequately considered and discussed, leading to inconclusiveness. After the macroeconomic events of 2014 and 2015, there is a need to develop informed decision-making in policy circles and government agencies, which is also supported by academic research. For this reason, this study fills this substantial contextual gap.

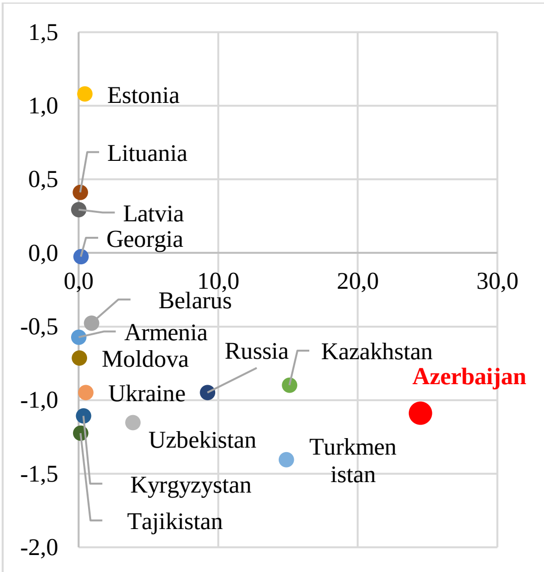
Azerbaijan was the most dependent on oil rents among the 15 FSU countries (even more so than other oil-rich countries such as Russia, Kazakhstan, and Turkmenistan), while indicators of institutional quality were low (see Figure 1.1., panels *a* and *b*). This suggests that Azerbaijan's success or failure in achieving stable, long-term economic development depends on a proper understanding of the oil industry. For this reason, Azerbaijan is likely to have more statistically relevant trends than some other FSU countries (e.g., Russia, Kazakhstan) where the non-oil manufacturing industry is still active, which can be methodologically analyzed in the NRC and DD frameworks.

Figure 1.1: Oil rents and institutional quality among the post-Soviet countries.

a. Relationship between oil rents as % of GDP (X-axis) and the voice and accountability index (Y-axis) between 1996 and 2020 among post-Soviet countries.



a. Relationship between oil rents as % of GDP (X-axis) and control of corruption (Y-axis) between 1996 and 2020 among post-Soviet countries.



Source: World Bank.

In the NRC and DD studies, it is usually argued that a booming sector and dependence on natural resources lead to a rentier state that is not interested in diversifying domestic production and exports, but the question "how exactly does this lopsidedness occur?" is not answered. For this reason, the case study of a particular chemical subsectors (as an individual representative of the system concept of "non-oil production") allows us to address this conceptual gap and also to address the methodological limitations of previous studies (e.g., insufficient samples, biased research designs, especially when only quantitative methods are used).

Focusing this work on a single country and sector allowed to avoid the problems associated with case selection, levels, and scope of comparative studies and allowed for a more focused and in-depth examination of the specific NRC and DD signs in Azerbaijan. Although Azerbaijan can be compared to at least some post-Soviet oil-rich countries, it was initially challenging to focus precisely on establishing equivalence between the countries and their non-oil-producing industries. Although the very goal of comparative studies is to look for commonalities and divergences, it remains difficult to identify universal patterns in social science research (Mills–van de Bunt–de Brujin 2006). Moreover, the causality required to capture the effects of NRC and DD and their impact on subsectors appeared to be more pronounced in the chemical sector in Azerbaijan than in other non-oil manufacturing sectors such as textiles, machinery, food, and clothing. In other words, only certain subsectors of the chemical industry (e.g., chlorine, soda, sulphuric acid) promised a causal relationship between the rise of the oil industry and the key variables of DD when observed. In contrast, other non-oil manufacturing sectors and subsectors of the chemical industry (e.g., polyethylene, oxygen, and nitrogen production) did not convince descriptively that they were de-industrialized compared to the oil industry, according to the initial visual inspection of the time series. In fact, Azerbaijan was one of the most important centers of chemical production during the years of the Soviet Union, and it was logical to expect its de-industrialization due to a lack of competitiveness. To have a de-industrialized sector, there must first be a well-established industry. Since Azerbaijan was and is a country rich in oil and natural gas, the central government of the USSR made several decisions to establish production facilities in the chemical sector. Finally, the current industrial policy of the government to diversify domestic production is mainly based on two sectors: agriculture and chemicals. Therefore, the analysis of the chemical subsectors that have been de-industrialized and are currently being re-industrialized under the assumption of possible negative effects of the oil industry promises fruitful theoretical and empirical insights.

The author's previous education and ability to directly observe the main macroeconomic events in Azerbaijan related to specific subsectors allowed obtaining valuable and detailed information (e.g., expert interviews, calculation of the Extractive Dependency Index, or EDI) that could only be analyzed in the context of a country- and sector-specific approach instead of a comparative and cross-sector scenario. Thanks to the country-specific research design, the necessary data sources and variables of interest could be operationalized, and their contextual interpretation could be carried out in a more certain way. The author's educational background and pre-existing knowledge of the Azerbaijani economy played a critical role in the selection of the Azerbaijani economy and its non-oil manufacturing sectors to develop a deeper understanding of NRC and DD phenomena for the future phases of this line of research. Finally, the application of the original theory of DD allows a generalization of the observed results, even though the present study is an investigation of the phenomenon in a single country.

1.4. Research objectives

The main objective of this study was to identify the adverse effects of the booming oil sector on lagging sectors in Azerbaijan. The specific objectives of this study were as follows:

1. To examine whether the dominance of the oil sector has negatively affected Azerbaijan’s economy at the level of politics, institutions, governance, education, and human capital;
2. To determine whether the economic explanation provided by the NRC doctrine (i.e., DD) is applicable to Azerbaijan’s economy and whether it hinders non-oil manufacturing growth and development;
3. To demonstrate the relevance of the de-industrialization process that results from resource dependence and how it decreases the opportunity for sustainable and long-term prosperity;
4. To analyze available policy alternatives in the short, medium, and long term using the proposed explanatory framework.

1.5. Research questions

To achieve the aforementioned research objectives, the following key research questions and side questions were formulated:

1. What are the main stages of development of Azerbaijan’s economy reflected in the main macroeconomic indicators? *Side questions*: Are there subtle differences between the stages of development that were influenced by the oil sector? What were the main policy measures taken by the government to make the transition

from a command economy to an economic system based on a free market economy?

2. What impact has the oil sector had on institutional quality in Azerbaijan? *Side questions*: Has the oil boom led to lower spending on education and health care (corresponding to human capital in the case of the NRC)? Did public opinion reflect a societal desire to more effectively manage oil revenues during the oil boom period in Azerbaijan's economy?
3. Has the oil boom in Azerbaijan's economy created signs or effects of DD since the completion of major oil and natural gas projects (one possible consequence being the de-industrialization of non-oil manufacturing sectors)?
4. Has the chemicals industry experienced de-industrialization of its production since 1995 due to the oil sector? *Side question*: What are the reasons for the differences between the deindustrialized and reindustrialized subsectors of the chemicals industry?

1.6. Conceptual framework and hypotheses

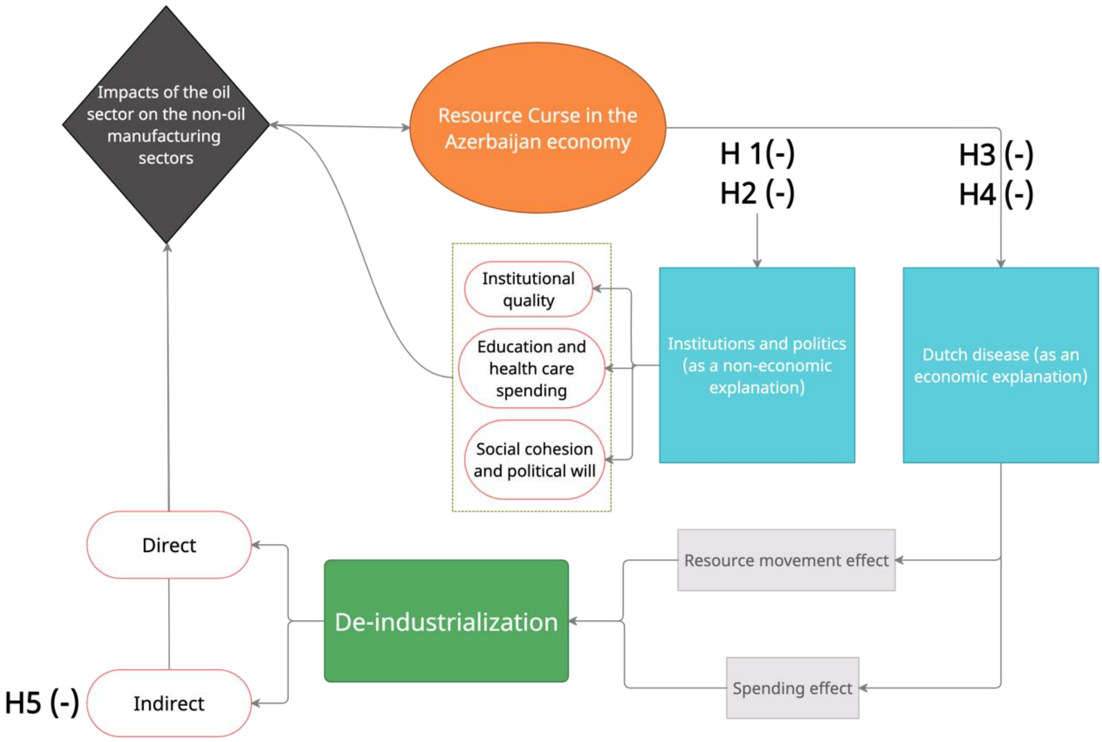
This section presents the conceptual framework and research hypotheses. Figure 1.1 depicts the research phases and interconnected parts required to explain the DD-induced de-industrialization of Azerbaijan's economy. The impact of the oil sector on Azerbaijan's non-oil manufacturing sectors is explained using both the noneconomic and economic components of the NRC doctrine. The noneconomic side emphasizes the role of institutions, education, and health care, as well as social cohesion and political will. This allowed the ability of the Azerbaijani government to manage oil revenues to be demonstrated. Furthermore, DD as an economic explanation was tested by examining how changes in resource movement and spending can lead to direct or indirect de-industrialization.

This study adopted a step-by-step deductive approach and was based on several hypotheses. These were derived from the NRC and DD theories, in which de-industrialization is assumed to be a negative effect of the oil boom. Based on the conceptual framework proposed in Figure 1.1, the process of de-industrialization was expected to be observed at the fiscal and monetary levels due to the negative impact of oil revenue mismanagement. The hypotheses are described below.

Set 1: Presence of the NRC

Based on previous studies, relying only on economic explanations (which mainly employ the DD hypothesis) or simply assuming that oil-rich countries suffer the same fate is not sufficient for determining whether the oil sector in Azerbaijan has created backward non-oil sectors. Noneconomic explanations of the NRC doctrine emphasize institutional, political, and governance indicators (Gelb 1988; Deacon 2011; Heller 2006; de Medeiros Costa–dos Santos 2013; Abdulahi et al. 2019). The data set provided by the World Bank's Worldwide Governance Indicators allows the statistical correlation and association between oil industry dominance and institutional quality to be analyzed. The NRC-related hypotheses used in this study are presented in Table 1.1:

Figure 1.2: Conceptual framework for the study.



Source: Author's illustration.
Note: Here, H1–H5 denote the four key hypotheses and the expected sign of the relationship between the oil sector and national economy of Azerbaijan.

Table 1.1: Research hypotheses related to the natural resource curse (NRC) doctrine in Azerbaijan's economy.

1	$H_0 1$: The oil sector does not have any significant influence on institutional quality: $\beta_1=\beta_2=...=\beta_k=0$; $H_a 1$: Oil-related variables have a negative influence on political and

	institutional quality: $\beta_j < 0$ for at least one j.
2	$H_0$2: There is no statistically significant association between the oil-related variables and human capital indicators, such as education and health care: $\beta_1=\beta_2=...=\beta_k=0$; H_a2: Oil-related variables (e.g., oil rents, oil dependency, and oil abundance) have a negative relationship with human capital indicators, such as education and health care: $\beta_j < 0$ for at least one j.

Set 2: Diagnosing DD

Studies related to DD should be well planned and empirically based. The main problem with previous studies on DD in Azerbaijan (Gahramanov–Fan 2002; Yıldırım Mızrak–Gurbanov 2013; Zulfigarov–Neuenkirch 2019; Şanlisoy–Ekinci 2019) is their one-sided investigation of exchange rate issues and GDP without proper consideration of the original theory of Corden and Neary (1982) and Corden (1984). In other words, these studies have only analyzed the relationship among Azerbaijan's oil prices, GDP, and REER. However, research on DD should also consider the sectoral movement of resources and government expenditure. Accordingly, the second set of hypotheses is presented in Table 1.2:

Table 1.2: Research hypotheses related to Dutch disease (DD) syndrome in Azerbaijan's economy.

1	$H_0$3: Oil prices do not have positive relationship with the Azerbaijani REER: $\beta_1=\beta_2=...=\beta_k=0$; H_a3: Oil prices appreciate the Azerbaijan's REER: $\beta_j > 0$ for at least one j.
2	$H_0$4: The nominal or real effective exchange rate and oil-related variables do not have a negative relationship (growth-reducing) with non-oil manufacturing: $\beta_1=\beta_2=...=\beta_k=0$; H_a4: The nominal or real effective exchange rate and oil-related variables have a negative relationship (growth-reducing) with non-oil manufacturing: $\beta_j < 0$ for at least one j.
3	$H_0$5: Higher oil prices and the appreciation of the REER do not have a statistically significant and theoretically meaningful impact on non-oil manufacturing output and employment in Azerbaijan: $\beta_1=\beta_2=...=\beta_k=0$;

	H_a5: Higher oil prices and the appreciation of the REER had either a direct or indirect impact on sectoral output and employment in the non-oil manufacturing sector in Azerbaijan: $\beta_j < 0$ for at least one j.
4	H_06: Oil revenue does not create any inflationary effects through government revenue or spending and population income[9]: $\beta_1=\beta_2=...=\beta_k=0$; H_a6: Oil revenue creates inflationary effects through government revenue or spending and population income: $\beta_j < 0$ for at least one j.

Set 3: De-industrialization

De-industrialization has not been studied in much depth for Azerbaijan. The theories of DD and NRC allow the occurrence of de-industrialization to be conceptualized. The main hypothesis examined in Chapter 5 is presented in Table 1.3:

Table 1.3: Research hypotheses related to the de-industrialization process in Azerbaijan's economy.

1	H_07: Dutch disease in Azerbaijan has not led to the de-industrialization of non-oil tradeable industrial sectors since 1995, especially in the chemicals industry: $\beta_1=\beta_2=...=\beta_k=0$; H_a7: Dutch disease in Azerbaijan has led to the de-industrialization of non-oil tradeable industrial sectors since 1995, especially in the chemicals industry: $\beta_j < 0$ for at least one j.

1.7. Dissertation outline

This dissertation consists of six chapters, the remainder of which are organized as follows: Chapter 2 reviews the main macroeconomic indicators and policy decisions in Azerbaijan since 1991 and presents the necessary facts about the country's economy. Chapter 3 reviews the literature on the level of NRC, DD, and de-industrialization. Chapter 4 presents the data collection process and methods used. Chapter 5 reports on the results. Chapters 3 and 4 present the methods and results at three levels: NRC, DD, and de-industrialization of the chemical industry. Finally, Chapter 6 reviews the economic policy responses, policy implications, and suggestions for future research

[9] Total income is the sum of primary incomes including salaries of employees, incomes from entrepreneurial activities, incomes from property, and current and capital transfers.

based on a literature review of other oil-rich countries, where the NRC and DD have been common obstacles to overcoming excessive oil dependence.

CHAPTER 2

UNDERSTANDING AZERBAIJAN'S ECONOMY

This chapter presents an overview of the developmental stages of Azerbaijan's economy. First, Section 2.1 examines macroeconomic stability and stimulation policies, the liberalization of the economy, institution building, foreign economic relations, and the development of the private economy. Then, Section 2.2 describes selected macroeconomic indicators. Finally, Section 2.3 provides a summary of the chapter.

2.1. Azerbaijan's economy since independence

To demonstrate the importance of national economies' developmental stages, the institutionalist school of economic literature emphasizes the historical origins of current institutions and the causes of long-term economic consequences (Acemoglu et al. 2001, 2002). Azerbaijan moved away from a centrally planned command economy in 1991 when the Union of Soviet Socialist Republics (USSR) collapsed. The Soviet era comprehensively and ideologically shaped the economic traditions, activities, and behaviors of economic actors in Azerbaijan (read: the superiority of the communist economy). Independence required a shift in thinking – not only in rejecting a Marxist-Leninist political economy but also in learning how markets could reform the economies of the newly independent post-Soviet countries (Zaostrovtsev 2016). Thus, the collapse of the USSR created various conditions for building a national economy in Azerbaijan.

Between 1920 and 1991, the command economy and socialism eradicated market principles and weakened the entrepreneurial abilities of Azerbaijan's citizens (Cornell 2015). In the early years of independence, Azerbaijan was a semideveloped and socially secular post-Soviet Muslim country, not an economically liberal polity (Khalilzada 2019). Then, in the late 1990s and early 2000s, preparations for and a rapid transition to oil-driven economic development occurred. As a newly established state, Azerbaijan displayed complex patterns of political and economic development. Nevertheless, its economy can be divided into modern stages of development based on certain political and economic events.

For instance, Güneş (2020) offered a two-stage chronology: a period of chaos and instability (1991–1995) and a period of macroeconomic stability and dynamic economic development (1996 to the present). This approach encapsulates the economic realities of Azerbaijan’s economy; however, by focusing only on the main political events, it fails to represent or oversimplifies key developmental events and decisions. As cited in Amirbekov (2015), Rustamov (2010) took a different approach by dividing Azerbaijan’s economic development into the following stages: transformational recession (1992–1995), stabilization and recovery (1996–2000), investment-led growth[10] (2001–2004), and the oil boom (2005–2008). However, this approach ignores critical aspects of the transition from a command to a market economy (e.g., waves of privatization and GDP recovery) and shortens the duration of the oil boom.[11] To effectively capture the recent phases of Azerbaijan’s economic development and rapid macroeconomic changes, a more comprehensive approach is required.

Aliyev and Suleymanov (2015) analyzed the macroeconomy of Azerbaijan in three stages, namely the recession (1991–1994), the restructuring or recovery period (1995–2004), and the oil boom period (2005 onwards).[12] This approach is more in line with the time frame of crucial economic and political events in Azerbaijan. However, it is necessary to consider a fourth stage from 2015 to 2020, which corresponds to the post-boom period. Thus, it captures the consequences of the price decline in international commodity markets. Therefore, a step-by-step analysis of Azerbaijan’s post-Soviet economy allows factors to be identified that have led to successful outcomes and hindered processes of transition and diversification. This modified framework helps to explain how the extractive industry led to a growing gap between oil production and non-oil tradeable sectors within Azerbaijan’s economy.

The four-step assessment is done by focusing on different aspects of Azerbaijan's macroeconomy between 1991 and 2020. Subsection 2.1.1 provides an overview of macroeconomic stability and stimulation policies. Subsection 2.1.2 focuses on institution building. Then. Subsections 2.1.3 and 2.1.4 provide an overview of liberalization and foreign economic relations, respectively. Finally, Subsection 2.1.5 addresses the creation of a private sector.

---

[10] Mainly because of the positive role of Foreign Direct Investments (FDI).

[11] The oil boom period should not be limited to the extraction boom as in Rustamov’s (2010) consideration. Rather, it should also include the revenue boom that usually occurs during following the extraction boom. This is why the widely accepted oil boom period in Azerbaijan covers the range between 2005 and 2014.

[12] Soyak and Nesirova (2003) also divided the modern history of the Azerbaijan economy into periods that correspond to 1991 to 1995 and 1995 and later. However, at the time of writing (2003), the authors did not have enough data to include other economic events and indicators, nor access to political and governmental decisions that would have enabled them to present a more up-to-date development timeline.

2.1.1. Macroeconomic stability and stimulation policies

From the late 1980s, Azerbaijan experienced severe periods of recession, which intensified when the USSR collapsed in 1991 (IMF 1995). Azerbaijan's economy contracted by an average of 63% between 1989 and 1995, compared with 42% in other countries of the former Soviet Union (FSU, World Bank 2003). Moreover, Azerbaijan's cumulative real GDP declined by 61%, approximately 30% higher than those of other post-Soviet countries. In the early years of independence, Azerbaijani industry was unable to deliver marketable products. This was because manufacturing enterprises produced low-quality products at high prices and depended on the centrally controlled inefficient division of labor (Cornell 2015).

The main cause of macroeconomic instability during the recession period was hyperinflation. Compared with 1993, the consumer price index (CPI) increased by 1,664% in 1994 (IMF 1995). The National Bank of Azerbaijan (ANB)[13] printed money to finance the large fiscal deficits caused by hyperinflation (IMF 1997). Because of continued hyperinflation and a significant lack of confidence in the manat (Azerbaijan's currency), foreign currency holdings surged dramatically and the nominal exchange rate depreciated in 1994 (IMF 1995, 1997). This led to rapid dollarization and a deterioration in the terms of trade (TOT), which peaked in 1994 (IMF 1995). The resulting price increases for imports exacerbated the rise in the CPI, as imported food and other products were heavily weighted in the consumer basket. In addition, the Azerbaijani government failed to initiate the developments necessary to stabilize the macroeconomy. However, in 1995, the state introduced several policy measures to tackle the most pressing problems related to macroeconomic stability. The recovery stage is discussed later.

At the beginning of the recession period, the nationwide banking crisis exacerbated macroeconomic instability at the level of the national economy. The state responded by passing the National Bank Law in February 1992 and the Law on Banks and Banking Operations in August 1992. As a result, the EBRD (1995) reported the emergence of 200 small commercial banks, which accounted for 10% of total loans to enterprises and individuals. New minimum capital requirements for commercial banks led to their consolidation by the end of 1995, reducing their number (EBRD 1995). In addition, the "National Bank of Azerbaijan was granted broad powers of prudential

[13] The ANB is now known as the Central Bank of the Republic of Azerbaijan (CBAR).

regulation" to effectively regulate the banking sector against further banking crises (EBRD 1995: 35); however, enforcement was weak. Underdeveloped financial institutions and a lack of will to reform slowed the country's transition to a market economy (Schroeder 1996).

During the recession, Azerbaijan lacked financial institutions outside of the banking sector, such as active investment funds, which could have stimulated the financial system through private capital (EBRD 1995). Moreover, the lack of a stock exchange drastically limited the government's ability to implement macroeconomic stability and stimulus measures to facilitate the transition to a market economy (EBRD 1995).[14] To stimulate foreign exchange trading, the ANB established a facility in August 1994 called the Baku Interbank Currency Exchange (BICEX) for commercial banks, promoting trading in non-cash foreign exchange (IMF 1995).

At the end of the recession period, the government applied to "Rehabilitation Credit" from the World Bank to stimulate the national economy and overcome obstacles on the reform agenda (World Bank 1995). The rehabilitation loan was intended to support structural reforms to stabilize a country's macroeconomy and accelerate its transition to a market economy (World Bank 1996). It provided financial support for Azerbaijan's efforts to implement key transformation measures. Another economic stimulus package was the state program "Entrepreneurship Development in Azerbaijan" (1993–1995). This sought to increase the number of small and medium-sized enterprises (SMEs) to rebuild foreign economic relations and boost production. The program provided the necessary infrastructure and a favorable environment for local entrepreneurs to do business. For instance, in addition to providing technical assistance to new businesses, the state reduced unnecessary audits by state agencies as well as corruption rates (Mustafayev 2016a). Moreover, the number of licensed economic activities was decreased to encourage the emergence of new entrepreneurs in the national economy (Mustafayev 2016a). However, the following factors still threatened macroeconomic stability: high inflation, erosion of real wages, a weakened exchange rate, depleted international reserves, the six-year military conflict with Armenia over the Nagorno-Karabakh region,[15] and high political uncertainty (IMF 1997).

---

[14] However, it should be mentioned that the Law on Securities and Stock Exchange was passed in November 1992.

[15] War and political turmoil led to many uncertainties in business prospects within the national economy of Azerbaijan. The country experienced continuous shortages in food and raw materials for production and high inflation rates, which decreased well-being (Cornell 2015). Furthermore, the war with Armenia

The "Contract of the Century"[16] and the 1994 ceasefire with Armenia led to greater macroeconomic stability in Azerbaijan throughout the recovery period, which began in 1995. Structural reforms supervised by the World Bank and IMF facilitated this stability. Surprisingly, even before the oil boom (2005–2014), Azerbaijan became the fastest growing economy in the post-Soviet landscape; its GDP grew by 10% year-on-year in 1998 and by 7.2% in 1999 (Aras et al. 2016; Cornell 2015). Moreover, the government implemented radical economic reforms to overcome economic imbalances, hyperinflation, and declining living standards during the recovery phase (Kaynak–Nasirova 2005).

In contrast to the recession period, the recovery stage began with strict and efficient tax collection by the state and sharp expenditure compression actions (contractionary fiscal policy), ensuring fiscal consolidation (IMF 1995). "As a result, central bank financing of the government budget deficit declined from 11% of GDP in 1994 to 1.5% of GDP in the first nine months of 1995" (IMF 1995). Similarly, growth in the domestic broad money[17] supply declined from 18% to 8% at the end of 1995 compared with the end of 1994 (IMF 1995). Moreover, the availability of large external financing due to new oil contracts led to an increase in the government budget and an improvement in monetary stability; during the recovery period, these factors led to a sharp decline in budget financing by the central bank (IMF 1995).[18] In addition, the nominal exchange rate stabilized, while the average monthly inflation rate fell to 1.5%

meant that two key sectors in Azerbaijan—agriculture and industry—could not retain enough investment for restructuring and revitalizing national economic development (Luong–Weinthal 2001). According to Starr et al. (1998), the great powers' geopolitical preference for Armenia delayed the transition process in Azerbaijan.

[16] The Contract of the Century was an agreement between 12 large oil extraction companies to utilize cheap, high-quality, and abundant oil fields such as Azeri, Chirag, and Guneshli (ACG) located in the Caspian Sea, near the Absheron Peninsula. The resources of the Caspian basin were a viable option for Western countries to choose over those in Persian Gulf countries. In addition, during the early years of Azerbaijan's independence, the collapse of industry meant that the country was unable to generate competitive products for world markets. During the Soviet years, Azerbaijan's economy had already been based on natural resources. Later, the Contract of the Century initiated a new stage of resource-led development in Azerbaijan.

[17] "Broad money" refers to the amount of money in circulation in a given economy. It is viewed as the most comprehensive approach to assess a country's money supply, taking into account narrow money and other assets that can be quickly changed into cash to purchase goods and services. Source: Investopedia (2021).

[18] Azerbaijan earned a USD 91 million signing bonus for finalizing an oil deal with foreign oil corporations in 1995, which was channeled into the budget. Although the monetary impacts of these foreign exchange inflows were not completely sterilized (a sudden injection of a huge amount of foreign currency creates inflationary pressures that a government must address), they offered a significant source of budget financing without jeopardizing monetary stability.

in 1995 (IMF 1995). Thus, the expansion of credit and money was brought under control.

In 1997, Azerbaijani production recovered, mainly due to new investments in the country's oil fields (IMF 1998). The unemployment rate remained high (approx. 19%) during the first half of the recovery stage; nevertheless, the IMF (1998) reported a decline in industrial employment and an increase in agricultural employment due to the growing number of private farms created by new land reforms.

In the early years of recovery, stimulation programs included the International Development Association (IDA)'s comprehensive restructuring programs, the World Bank's Third Structural Adjustment Credit (SAC III), and the Azerbaijani government's State Program for Socioeconomic Development of the Regions of the Republic of Azerbaijan for 2004–2008. The critical component of SAC III was the privatization of the utilities sector; here, private sector development was supported by business environment studies and consulting services by specialists for the privatization of medium and large industrial enterprises (also referred to as conditional credits; World Bank 1999a). Furthermore, the aforementioned State Program promised new jobs and economic diversification by reducing disparities in socioeconomic development between the capital and Azerbaijan's regions.

However, according to various experts, the macroeconomic and stimulation measures were not sufficient for overcoming the major challenges in the recovery phase. So-called "light oil money" hindered balanced and sustainable economic development, as state officials became increasingly lax in fighting for a share of oil revenues (Ibadoglu 2008). This strengthened corrupt ties between state officials and businesses and made the construction sector the main priority for state budget spending. Only expensive infrastructure projects allowed for a quick transfer of oil money from the state budget into the hands of the corrupt (Ibadoglu 2008).

Meanwhile, the expected diversification of the economy through greater private sector participation remained sluggish. According to the World Bank's "Doing Business 2004" report, an average of 106 days were required to start a business in Azerbaijan, compared with only 25 and 30 days in Armenia and Georgia, respectively (Doing Business 2004).[19] New jobs and economic diversification leading to macroeconomic

[19] In addition, opening a business in Azerbaijan required 14 procedures and cost USD 119. By comparison, Armenia required 10 procedures and USD 68 to open a business, and Georgia required nine procedures and USD 171 to open a business (Doing Business 2004).

stability and stimulation are only possible if the private sector is well developed and supported. However, at the end of the recovery period, structural changes accelerated at the expense of non-oil manufacturing and agriculture, despite loans from international organizations and government programs favoring oil tradeable sectors (Ibadoglu 2008).

During the oil boom period, major macroeconomic events and stimulation packages were implemented primarily because the government was quick to spend accumulated oil revenues. The government promoted expensive infrastructure projects and increased public wages, pensions, and social benefits to stimulate the consumer—or demand—side of the economy in the short term. Moreover, the overspending of oil revenues led to fiscal deficits in the state budget. This led the government to increase its use of funds from the State Oil Fund of the Republic of Azerbaijan (SOFAZ) to finance fiscal deficits (Suleymanov–Aliyev 2015). As a result, the state had a considerable propensity to spend immediately instead of pursuing a selective policy.

Nevertheless, the IMF (2010) reported "spectacular growth rates" in Azerbaijan during the oil boom. The country's GDP grew by an average of 18.8% between 2005 and 2010, the poverty rate fell from 45% in 2003 to 11% in 2009, and the unemployment rate reached its lowest level at 11% in 2009 (compared with 13% in 2008; IMF 2010). The exchange rate also stabilized: "The de jure exchange rate regime has been pegged to a euro-dollar basket since March 2008, but the de facto regime has been stabilized against the U.S. dollar since June 2008" (IMF 2010: 3). The receipt of substantial oil revenues was accompanied by a strengthening of the manat. The exchange rate was USD 1 to AZN 1 in 2006, which changed to USD 1 to AZN 0.80 in 2008 (Mehtiyev 2017). The national currency continued to appreciate until the end of the oil boom. At the end of 2014, the exchange rate was USD 1 to AZN 0.7844, thus remaining stable (Mehtiyev 2017).

However, the global financial crisis and the increasing importance of the oil sector undermined the sustainability of Azerbaijan's economy. Oil revenues fell by 35%, non-oil revenues were 17% below projections, and total exports fell by 30% in 2009 (IMF 2010).[20] As a result of the crisis, several state-owned enterprises (SOEs) and banks had difficulty extending short-term foreign liabilities, leading to a liquidity shortage in the banking system and a dramatic drop in credit growth (IMF 2010).

[20] With declining production in the construction and non-oil manufacturing sectors, non-oil GDP growth fell from 15.7% in 2008 to 3% in 2009, further reducing demand for credit and weakening bank loan portfolios.

Moreover, Mehtiyev (2017) reported that foreign direct investment (FDI) in the non-oil manufacturing sector declined significantly between 2010 and 2015. By contrast, most FDI went to the oil sector. During the oil boom, domestic capital owners viewed the non-oil manufacturing and agriculture sectors as risky and not worthy of investment (Mehtiyev 2017); thus, domestic investment contributed little to the non-oil development of Azerbaijan's non-oil economy. In addition, 70% of domestic investment (mostly from the state) went to infrastructure development and construction (Mehtiyev 2017).

During the oil boom, President Ilham Aliyev adopted the State Program for Socioeconomic Development of the Regions of the Azerbaijan Republic for 2009–2013 as well as that for 2014–2018. They were aimed at increasing industrial production in the regions, creating a business-friendly environment, and encouraging domestic and foreign investment. The State Statistical Committee of the Republic of Azerbaijan (SSCRA; 2014) reported successful results of the abovementioned state programs. These included increased overall GDP in rural regions, increased competitiveness (measured by the global competitiveness index), higher FDI in non-oil sectors, and reduced inflation and poverty. However, Ibadoglu (2008) reported an increasing monopolization of Azerbaijan's economy and erroneous calculations by the state regarding the minimum wage. In 2006, the minimum living wage was AZN 58 per month, while in 2007 it was only AZN 64; according to alternative calculations, the actual minimum living wage was AZN 90. In addition, Ibadoglu (2008) found increased signs of DD, expressed in higher REER and CPI as well as in the resource movement effect.[21]

From 2015, a decrease in oil prices was felt through negative and lower GDP growth rates, higher budget deficits, and a decline in imports (Mukhtarov 2018). In addition, the Central Bank's strategic reserves fell by USD 8.74 billion and bottomed out at around USD 5 billion, the same level as in 2009 (Bayramov 2016). The decrease in oil revenues jeopardized the medium- and long-term fiscal balance and plans, while SOFAZ recorded a larger budget deficit (AZN 4.4 billion) in 2017 than in 2016 (Ahmadov 2016; Mukhtarov 2018). In addition, the banking sector fell into crisis, and CBAR drastically raised interest rates (Mehtiyev 2017). These developments forced the government to painfully rebalance Azerbaijan's macroeconomic dynamics. The

[21] In fact, FDI exclusively flowed into the oil sector, while the non-oil manufacturing sector was starved of investments needed to gain momentum.

commodity price crisis also entailed distressing new realities for citizens in terms of income and welfare. As a result, the first years of the post-boom period were chaotic and uncertain, as the government was unable to design a short-term adjustment plan (Ahmadov 2016).

Notably, the devaluation of the manat was the most remarkable macroeconomic event in the post-boom period. It and other difficulties related to the decline in oil prices first led to higher public debt as a share of GDP, which undid Azerbaijan's leading status as a relatively low-debt country among the post-Soviet countries (Ahmadov 2016). Although the government asserted that devaluation and a floating exchange rate should increase "the government's maneuverability to adjust the value of the national currency to oil prices" (Niftiyev 2020a), in practice a floating exchange rate did not occur. The exchange rate has been fixed at approximately AZN 1 to USD 1.70 and EUR 2 since 2015. Second, devaluation led to more expensive imports, rising inflation, public panic (leading to the conversion of deposits from manats to U.S. dollars), and an unofficial dollarization process. Third, the social impact of the crisis took the form of economic insecurity as food prices rose while the labor force did not experience any real increase in wages (Guliyev 2016). In addition, the devaluation hurt citizens who had mortgages in foreign currencies as their loans became more expensive. Another consequence of the devaluation was job cuts. The energy, telecommunications, and banking sectors reacted the fastest, laying off approximately 250–300 employees very shortly after the devaluation (Guliyev 2016). Finally, throughout the post-boom period, local and uncoordinated protests among the population occurred in response to increasing poverty and unemployment in rural areas (Guliyev 2016).

To mitigate the negative impact on the manat's value, the president signed a decree to increase the salaries and pensions of state employees (Guliyev 2016). In addition, the government promoted the devaluation as an opportunity to increase the competitiveness of non-oil exports and private sector participation in non-oil GDP (World Bank 2019).[22] According to Azerbaijani media reports, the devaluation boosted production in both the oil and non-oil tradeable sectors, supported domestic and foreign investments, and increased non-oil tax revenues (Azerbaijan Gazette 2019; Mustafayev 2016b). However, Bayramov (2020) argued that the reforms and stimulation programs did not bring about the desired regeneration of the national economy. In fact, the

[22] The devaluation of the national currency made exports cheaper, therefore provided a competitive edge for the producers and exporters.

increase in the share of non-oil manufacturing in total output and total exports was due to declines in oil production and exports. In other words, non-oil sectors grew not because of increased competitiveness of non-oil tradeable sectors but because of decreased oil production.

In February 2021, President Ilham Aliyev signed a new decree entitled "Azerbaijan 2030: National Priorities for Socioeconomic Development" (Aliyev 2021). The decree set out five priorities for an effective macroeconomic policy framework. They aim to ensure sustainable macroeconomic stability and strengthen the medium- and long-term "drivers" of economic development. Examples of such drivers include the modernization of human capital, expansion of the digital economy, and full economic sovereignty. The program emphasizes development principles such as the need for a steadily growing competitive economy; a society based on dynamic and inclusive social justice; competitive human capital and space for modern innovation; a great return of the liberated territories[23]; and a clean environment and "a pro-green" country.[24]

Thus, the government has continued its attempts to stimulate and regulate the economy after low commodity prices. However, after the second quarter of 2016, oil prices began to rise. Again, this caused the government to lose motivation to implement reforms and invest in human capital, which are critical for long-term sustainable economic growth and development. It is also important to have an overview of institutional changes based on the stages of development of the Azerbaijan economy to understand why certain policies have been successful while others have failed to achieve macroeconomic stability.

2.1.2. Institution Building

Many problems and challenges emerged during the recession period; however, the Azerbaijani government made various decisions and decrees to begin the process of institution building. In fact, institution building became a critical priority for ensuring

---

[23] In 2020 Azerbaijan and Armenia had the Second Karabakh War that ended with Azerbaijan's return of the previously occupied Nagorno Karabakh and surrounding districts. This enlarged the de facto territories of the Republic of Azerbaijan. Liberated areas were then included in the economic development programs.

[24] In December of 2016, the development program entitled Strategic Roadmap created a priority for increasing the share of the renewable energy sources in the overall energy production in Azerbaijan. The government became more interested in green growth and renewable energy sources because exporting oil and natural gas is more profitable than domestic consumption (Vidadili et al. 2017). Therefore, "Azerbaijan 2030: National Priorities for Socio-Economic Development" offered a different perspective of the state's strategy for renewable energy production during the post-boom period.

the country's smooth transition to a market economy after its socialist legacy. For instance, the State Committee on Property Issues, Anti-Monopoly Committee, Entrepreneurship Support Fund, and Committee on Foreign Investment were all established between 1992 and 1994 (Yunusov 2012). Moreover, Azerbaijan adopted the Law on Protection and Promotion of Foreign Investment in 1992 and has signed bilateral investment and tax treaties with many countries (Pashayev 2013). The manat (shortened to AZM, but AZN after the denomination in 2005) became the country's official currency in 1992, but its actual circulation only began in 1994 (Aras et al. 2016).[25]

During the recession period, legal regulations in newly independent Azerbaijan initially included the Law of the Republic of Azerbaijan, titled "Property in the Republic of Azerbaijan" (November 9, 1991); the Decree of the President of the Republic of Azerbaijan, titled "On Commercialization of the Activity of Trade Enterprise" (August 1, 1992); and the Law of the Republic of Azerbaijan on Destatization and Privatization in 1993 (Im et al. 1993). Structural reforms and important legislative regulations, such as the Tax Code, Land Code, Customs Code, and Labor Code, were developed during the early years of independence (Pashayev 2013). Value-added tax and the National Bank Law were introduced in 1992, and the Execution Bankruptcy Law was adopted in June 1994 (Aras et al. 2016).

Despite a limited capacity, considerable success was achieved in institution building during the recovery period (World Bank 2003). However, in the first half of the period, there was a failure to address "deep structural reforms such as large-scale enterprise privatization, banking reform, regulation and operation of public utilities, and delivery of social services were slower than expected" (World Bank 1999a: 5). The second half delivered mixed but improved results with regard to institutional reforms intended to address the legacy of inefficient production, monopolies, market failures, outdated technology, and other issues (World Bank 2003).

The establishment of SOFAZ in 1999 is considered one of the key socioeconomic developments of the recovery period. Primarily, it improved transparency and accountability (Wakeman Lin et al. 2003) in oil revenue management. In addition, Boyarchuk (2012) identified SOFAZ as the main factor that ensured short-

[25] It was assumed that Azerbaijan citizens needed time to gain trust in the manat over the Russian ruble, which had circulated within the country for a long time. However, as a national currency was an integral part of Azerbaijan's sovereignty, the government spent huge resources to build up the manat's value.

and medium-term stability in oil-sponsored government spending, especially with regard to energy projects.

Furthermore, a law called “On Land Reform” was introduced in 1996 during the recovery period. It provided legislative and regulatory mechanisms for dissolving collective and state farms. Until 1996, farmers followed the old Soviet-style organization of labor (i.e., collective unions) by using available resources in agricultural production (World Bank 1996). This created fuzzy property rights and several issues in the distribution and marketing of final products during the late recession and early recovery periods. Later, institutional support for the agriculture sector was provided through the Adaptable Credit Plan and complemented by International Finance Organization (IFC) activities to increase Azerbaijan’s competitiveness (World Bank 1999a).

Although institution building became more systematic during the recovery period, Azerbaijan’s anticipated large oil revenue troubled international experts. The World Bank (1999b) recommended implementing vigorous programs to combat corruption and public sector failures, which might in turn strengthen market mechanisms, provide property rights, and regulate the financial sector. A transparent and nondiscriminatory business environment was expected to increase efficiency and quality of life in poverty-stricken regions as well as improve social services. However, during this period, Azerbaijan’s institutional quality failed to reach a level sufficient for managing oil revenue and preventing corruption and poor governance (Ahmadov et al. 2013; World Bank 1999a).

Furthermore, during the oil boom, SOFAZ’s spending of oil revenue on immediate needs and long-term development goals was insufficient for achieving sustainability in the economy. However, future generations must benefit from oil wealth; thus, “further institutional building [was] needed for transparent project identification, planning, prioritization and execution” (World Bank Group 2015: 9). The IMF (2012) suggested broadening the tax base, reducing compliance costs, and enhancing transparency through tax reforms to boost non-oil tradeable sectors. However, underdevelopment and underinvestment in the judicial system and public courts for resolving business conflicts reflected a weak rule of law in Azerbaijan (World Bank 2006b). The World Bank Group (2015) reported weak institutional capacity and coordination, limited budget transparency, and low citizen influence. These factors led to institutional gaps in the monitoring and implementation of public policies at the end of the oil boom period.

Nevertheless, the government introduced two crucial institutional innovations during said period. The first was measures that accompanied agricultural privatization in rural areas, such as "land reform and rural credit commissions, town hall credit meetings, Water User Associations (WUA), and Community Associations" (Thurman 2004: 16). The second was the establishment of the State Agency for Public Service and Social Innovations under the President of the Republic of Azerbaijan (ASAN), which aims to decrease corruption and dysfunctionality in the public sector (Chantzi 2013).[26] ASAN seeks to reduce additional expenses and lost time as well as increase the level of professionalism in public service delivery, strengthen confidence in state bureaucracy, ensure access to electronic public services, increase transparency, and strengthen the fight against corruption.

The macroeconomic events of the post-boom period (e.g., devaluation of the national currency and low growth rates) strongly indicated a lack of institutional capacity for effectively combating the adverse effects of sharp commodity price slumps (Bayramov 2016). However, the state adopted several institutional measures to manage the negative outcomes of oil dependency, which were harshly revealed in the post-boom period. Ahmadov (2016) grouped the state's initiatives after 2014–2015 into three categories: strengthening financial security and predictability, liberalizing the economy and improving the entrepreneurship space, and establishing institutional reforms to support the development of non-oil sectors. First, strengthening financial security and predictability enabled the government to stabilize the exchange rate and decrease speculation with foreign currencies on the black market. To this end, CBAR reserves and a new entity called the Financial Market Control Chamber were established. Second, to liberalize the economy and improve the entrepreneurship space, institutional reforms were implemented to support the development of non-oil sectors, addressing failures in the privatization process during the oil supercycle (i.e., the oil boom). Nevertheless, the efficiency of these responses remains uncertain; moreover, the informal sector's large share in Azerbaijan's GDP complicates the use of traditional policy tools such as money supply and bank credits.

[26] ASAN gathered 100 public services from 25 government entities, which were meant to increase in the quantity after the establishment of e-governance (up to 477 services).

Third, in terms of institutional reforms, the institutionalization of non-oil development became the government's main focus. The Strategic Roadmap for the National Economic Outlook of the Republic of Azerbaijan was adopted in 2016, which sought to better target underdeveloped economic sectors through appropriate policies. Niftiyev (2020a) summarized the following additional institutional developments during the post-boom period: the establishment of the Center for Economic Reforms Analysis and Communication[27] and the Financial Stability Committee, decrees and laws on Additional Actions for Investment Promotions, Additional Measures for Promotion of the Non-oil Products, and Cancellation of the Inspections in Entrepreneurship (CIE).

Among these developments, the CIE law is particularly notable. It entered into force in November 2015 and contained the following first and fundamental item: "[I]nspections in the area of entrepreneurship in the territory of the Republic of Azerbaijan will be suspended until January 1, 2022" (Aliyev 2015). The law was adopted to prevent state agents from engaging in corruption. It was not the first attempt to decrease the arbitrariness of state interventions in business.[28] Poor enforcement of the rule of law and widespread corruption had previously led to an extremely high number of inspections of businesses, the main aim of which was to collect bribes. Although the government's efforts to significantly reduce the arbitrariness of state inspectors and civil servants mostly failed, CIE's passing ensured that only the most crucial inspections were conducted.[29] Thus, entrepreneurs were able to continue and even increase their participation in the creation of value-added products during the post-boom period.

---

[27] The Center for Economic Reforms Analysis and Communication seeks to provide policy suggestions to guide government reforms based on microeconomic and macroeconomic research. The Financial Stability Committee recommends policy actions to reform macroeconomic and financial stability in the national economy. Additional Actions to Investment Promotions, Additional Measures on Promotion of the Non-oil Products, and the Cancellation of the Inspections in Entrepreneurship cover governmental support to increase non-oil output by a variety of mechanisms, which range from financial to governance-related policies.

[28] In the official 2002 decree, President Haydar Aliyev stated, "Today, the work of a number of central, city, and district executive authorities, which implement state regulation of entrepreneurship, cannot be considered satisfactory. Thus, various central and local executive authorities, including tax, customs, law enforcement and sanitary-epidemiological services, interfere in the activities of entrepreneurs, obstructing their work by conducting various inspections. Bureaucratic pressures and biased decisions by courts in resolving economic disputes are common. All this causes legitimate dissatisfaction of people engaged in entrepreneurial activities, it does not allow them to realize their entrepreneurial initiatives and make full use of internal potential" (Aliyev 2002).

[29] The law states, "the provisions of this Law shall not apply to inspections carried out by the Prosecutor General's Office of the Republic of Azerbaijan in connection with the investigation of corruption crimes."

In addition, the Azerbaijan Investment Holding (AIH) was another development in institution building during this period. AIH is a public legal body established through a decree by the President of the Republic of Azerbaijan dated August 7, 2020. Its goal is to improve the management and operation of state-owned companies and enterprises as well as businesses with a share of state capital. It represents the first stage in the full privatization of problematic SOEs, as it attempts to improve the economic efficiency and transparency of their investment programs, ensure their competitiveness, and improve their financial health and sustainability (AIH 2021). However, AIH is a relatively new development, and thus, real results have yet to be seen.

2.1.3. Liberalization of the economy

During the recession period, price liberalization was the government's main concern. The government intended to focus exclusively on the price ragualtions of the natural monopolies (World Bank 1995). "In 1992, 70–80% of the producer and consumer prices were liberalized, with further rounds of liberalization later in 1992 and 1993, leaving bread and energy as the main goods under the price controls" (EBRD 1995). In addition, the prices of utilities and petroleum products remained under state control, while those of housing, rent, transportation fares, electricity, and other public utilities were administratively set, remaining far below cost recovery levels (IMF 1995).[30] Overall, price liberalization during this period was rapid but inefficient. The government tailored its structural adjustment reforms according to increasing energy prices.

During the recession period, the most critical steps in liberalizing Azerbaijan's financial system were to utilize oil resources and eliminate barriers to investing in extractive industries (Rakov 2020; Agaev 2012). At the end of the period, the state eliminated all quotas and licensing restrictions for both imports and exports, except for certain "strategic goods" such as oil and cotton (EBRD 1995). Another aspect of the large-scale economic liberalization was wage liberalization; until May 1994, wage ceilings had been imposed on enterprises (EBRD 1995). Lastly, the government's measures throughout this period to address monetary policy resulted in the liberalization of interest rates for most of 1995 (EBRD 1995).

[30] According to the World Bank's (1995) Institution Building Technical Assistance Project, the government liberalized other prices (including bread prices) and energy prices near the end of the recession period.

During the recovery period, the government focused on land privatization and farm restructuring as liberalization policies to help overcome agricultural production crises (Thurman 2004; World Bank 2006b). In fact, overall agricultural output rose by 53% in 2003 compared with 1995 levels, and household and other small farms increased their participation in agricultural production. Moreover, government imports of grain were eliminated, and quota and licensing requirements were removed at the end of March 1995 to reduce the state's dominant role in foreign trade (World Bank 1995). In January 1995, the government fully liberalized domestic prices by abolishing state orders for enterprises and ending bread subsidies (IMF 1995). In other words, the state was still making production plans for domestic enterprises until 1995, but it ceded full control to them over how much to produce during the recovery. Furthermore, domestic "prices of oil and oil products were raised to about half world levels at the beginning of 1995, with the intention to reach parity with world market prices within the next few months" (EBRD 1995: 35).

The recovery period also saw the large-scale liberalization of financial transactions and exchange rate regimes. According to Rakov (2020), Azerbaijan gradually pursued a policy of liberalizing in the capital account. In 1995, it established a regime of soft pegging the national currency's exchange rate, which continued post-boom. In terms of financial openness (the ratio of total capital flows as a proportion of GDP), Rakov (2020) ranked Azerbaijan second among the Caspian basin countries in 2018, as the inflow and outflow of FDI to and from the country were free and constantly changing. In addition, markets for exchange auctions and Central Bank refinanced credits were established to more efficiently allocate available financial resources, which slightly increased transparency. Furthermore, the application of the modern tax code, more transparent budget execution and accounting, and a tighter internal and external audit capacity supported the rapid adaptation of Azerbaijan's economy in favor of liberalization.

Moreover, the anticipated large-scale privatization of the telecommunications, aviation, chemical, and industrial sectors made modest progress during the recovery period (EBRD 2003; 2004).[31] Attempts to privatize gas and water utility SOEs continued; in September 2002, four newly constructed regional electric supply infrastructures were entrusted with 25-year private management contracts to increase

[31] Despite this, the government announced its plan to sell its stakes in Azercell and Bakcell, two cellular phone companies, by the end of 2003 (EBRD 2003).

their efficiency and attract investment (EBRD 2003). However, these liberalization steps were not continued after oil revenues began to enter the country, and the agreements between the state and private sector were annulled in 2006. The government also gained full control over the electricity supply infrastructure (Mehtiyev 2017). In other words, large oil revenues prevented improvements in Azerbaijan's economic efficiency (Mehtiyev 2017), jeopardizing large-scale privatization and complicating further developments in liberalization (EBRD 2003). At the end of the recovery period, the EBRD (2004: 98) reported that "the main railway and shipping companies will also be transformed into joint-stock companies in advance of planned privatisation." However, the SOEs Azerbaijan Railways CJSC and Azerbaijan Caspian Shipping CJSC have still not undergone liberalization.[32]

During the oil boom period, only a handful of state liberalization measures were taken. This was partly due to the main privatization targets being completed[33] and the large oil revenue allowing the government to relax. Thus, rapidly generated oil rents provided new opportunities for the state to avoid relying on Azerbaijan's non-oil productive capacity, and it turned their attention to expenditures on patronage and security forces (Guliyev 2013). Nevertheless, the IMF (2005) reported substantial progress in exchange rates and trade liberalization toward the end of the recovery and at the beginning of the oil boom. Moreover, during the latter period, Azerbaijan maintained a trade system that was free from non-tariff restrictions; in fact, the average tariff was 6% (IMF 2005a). Furthermore, "the liberalization of the telecommunications market had opened up opportunities for the private sector," leading tariffs for unlimited broadband internet to plummet (EBRD 2015: p. 97).

In early 2005, the IMF recommended privatizing the state-owned Kapital Bank and the International Bank of Azerbaijan (IBA; IMF 2005a). However, only Kapital Bank was privatized. Since IBA was the largest bank in the South Caucasus, the state continued to play a prominent role in the banking sector, which entailed its own set of complications. Hasanov (2017) concluded that a lack of transparency, large-scale corruption, poor management, weak supervision, and false audits caused IBA's assets to

[32] In the railway and shipping sectors, one major development was the transfer of Azerbaijan Railways CJSC and Azerbaijan Caspian Shipping CJSC to Investment Holding for cooperative management. However, the supervisory boards created by Investment Holding to increase efficiency, transparency, and governance were not composed of independent managers but rather the usual state officials from various parts of the government.
[33] At the beginning of the recovery period (1996–1998) a total of 6,303 small enterprises were privatized. In 2004, this number dropped to 1,934 (Ibadoghlu 2021).

become problematic (e.g., fewer liquid assets, problems meeting capital adequacy requirements, and increased foreign liabilities). Moreover, “failure to take adequate measures, despite the continuous violation of requirements of banking legislation and the norms of the Central Bank of Azerbaijan,” seriously undermined the bank’s management practices (Hasanov 2017: 39).

Although small-scale privatization continued during the post-boom period, most of the liberalization process was almost complete, and hence, it was no longer the government’s main focus. The liberalization of the economy and the improvement of entrepreneurship simply included presidential decrees to produce non-oil exportable goods, reform customs, and simplify licenses and permits for businesses during the post-boom period. The EBRD (2020) reported that the authorities partly liberalized the foreign currency operations regime. Specifically, imports with a total cost of less than USD 10,000 were excluded from reporting to currency control authorities under new guidelines to speed up imports. This amendment led to a reduction in delays caused by bureaucratic operations. However, the post-boom period drew attention to SOEs, as the Azerbaijani government needed to improve governance to reduce costs after sharp commodity price downturns in 2014. The Supervisory Board of the State Oil Company of the Azerbaijan Republic (SOCAR) was established by order of President Ilham Aliyev on January 23, 2021 to exercise general management and control over the activities of SOCAR (Ibadoghlu 2021). Similarly, supervisory boards at Azerbaijan Airlines CJSC, BakuBus LLC, Azerbaijan Railways CJSC, and Baku Metro CJSC were approved by presidential decree on March 30, 2021 (Ibadoghlu 2021).

Furthermore, the Strategic Roadmap from 2016 (introduced in Section 2.1.2) established many priorities and goals for liberalizing various sectors of Azerbaijan’s economy. For instance, it strongly recommended accelerating economic liberalization to optimize the costs and revenues of utilities and unused industrial facilities. The roadmap also underlined the necessity of liberalizing airlines and railways, since SOEs such as AZAL and Azerbaijan Railways CJSC currently provide expensive and below-par services. In addition, a new priority for the government is to develop the tourism sector; however, without liberalization, prices and services cannot be optimized to lure tourists. Since oil prices have been rising since 2017, none of these reforms have been implemented to the desired extent. Nevertheless, the monitoring of the roadmap promises modest progress in the near future.[34]

2.1.4. Foreign economic relations

Following the collapse of the USSR, the devastating consequences of breaking ties with other FSU countries and a decline in production were intensified by the collapse of inter-republic trade arrangements and payment systems (Taymas 1993, as quoted in Aliyev–Suleymanov 2015). According to Cornell (2015), the Soviet era brought industrialization, urbanization, infrastructure development, and high levels of education; however, the command economy and central government ensured that the integration of member countries into GVCs would be harsh if it became necessary (mainly if the Soviet Union collapsed). Soviet-style economic management ensured specialization in only a handful of sectors and production according to the specific and planned demands of other countries (Cornell 2015). Consequently, the collapse of the Soviet Union led to a collapse in supply and demand for the main goods and services in nearly all FSU countries.

Like other Commonwealth of Independent States (CIS) countries, Azerbaijan experienced a significant shift in external trade flows during the recession period. Following the disintegration of the Soviet Union, the country sought to retain centrally planned commercial links with CIS nations through a series of bilateral trade agreements. Under these agreements, trade volumes were typically determined at prices substantially lower than world market levels. During the Soviet era, production and trade among member countries were not based on principles such as economic efficiency and competitiveness; therefore, the collapse of the USSR left the FSU countries in a position in which supply linkages could not rebuild foreign trade. Bilateral agreements began to crumble in 1992 as suppliers pursued better rates in international markets. As a result, the share of non-CIS nations in trade steadily increased, and previous supply linkages became disadvantageous in a more competitive economic environment (IMF 1995).

During the recovery period, the role of energy projects was also more clearly observable in Azerbaijan’s foreign economic relations compared with the recession period. This small post-Soviet country in the South Caucasus began to wield its

[34] See “Monitoring and Evaluation 2016–2021” by the Center for Analysis of Economic Reforms and Communication for more details

geopolitical power in pipeline negotiations with the West, presenting itself as an alternative to the European Union (EU)'s energy security diversification plans (Abdullayev 2017). After the transit crisis between Russia and Ukraine, the EU Parliament and the Council of the EU classified the Southern Gas Corridor as "NG3" gas pipelines from the Caspian Basin and Middle East to Europe (Abdullayev 2017). This allowed Azerbaijan to access new markets and build political relations with EU countries, especially Bulgaria, Romania, Hungary, and Austria, which supported the emergence of new energy streams (Abdullayev 2017).

During the recovery period, several economic projects, a massive inflow of FDI, new agreements, and infrastructure projects to transfer oil and gas were completed in a short period of time. For instance, the Contract of the Century, also known as the ACG Fields Agreement, was a mega-project valued at USD 11 billion, with an estimated producible oil volume of 730 million tons and natural gas reserves of 96 billion m^3 (Aras et al. 2016).[35] Other significant projects in which Azerbaijan's oil and gas industry played a key role included the Nabucco gas pipeline (later renamed Western Nabucco), the Trans-Anatolian Gas Pipeline (TANAP), the Trans-Adriatic Pipeline (TAP), the Interconnector Turkey–Greece–Italy, and the Azerbaijan–Georgia–Romania Interconnector (Abdullayev 2017).

The structure of foreign trade in Azerbaijan also underwent rapid change during the recovery period (Mogulveskij and Točickaja 2005). At the end of June 2004, high oil prices led to a 34% year-on-year increase in the value of exports. Imports also grew, primarily in capital items connected to the expansion of the oil and gas sector. As a result, the trade balance dramatically deteriorated, rising from 1.9% of GDP in 2003 to 2.7% in 2004. In addition, the share of machinery, equipment, and transportation in imports rose from 19.2% to 40.3% between 1995 and 2003. This indicated the use of imports to reequip and modernize Azerbaijan's weakened economy.

The oil boom period began with decreased imports of capital goods due to the completion of large oil and natural gas projects (EBRD 2006). As a result, a huge trade surplus of nearly 4% of projected annual GDP was recorded in 2006, compared with a deficit of 6% in 2005 (EBRD 2006). In addition, the ratio of gross public external debt

[35] To deliver oil extracted from the ACG fields, Azerbaijan initiated the Baku–Tbilisi–Ceyhan (BTC) pipeline project, which was signed by the presidents of four countries (i.e., Azerbaijan, Georgia, Turkey, and Kazakhstan) in 1999; in 2006, the pipeline went into operation (Bayramov 2019).

to GDP declined from 18.6% in 2004 to 13.1% at the end of 2005 as the result of the government's policy to reduce external debt (EBRD 2006).

Kocharli (2011) discussed the rapid decrease in the manufacturing sector's share of exports from 1995 to 2008. In addition, Ibrahimova (2017) highlighted that food products accounted for 41.5% of total imports in 1995, compared with 19% in 2000 and 14.9% in 2015. Pylin (2015) stressed the decreased share of agricultural and non-oil manufacturing exports, which began during the oil boom period.[36]

Azerbaijan's main trade partners also exhibited changing patterns during the oil boom. At the time, the country's main export partners were Italy, Indonesia, Thailand, Germany, and Israel (Pylin 2015). Italy was the main importer of Azerbaijani crude oil, which Pylin (2015) attributed to its optimal geographic position in the Mediterranean Sea. This meant that it could easily trade with Azerbaijan with mediation from Turkey. However, established political and cultural relations also played a decisive role in determining the direction and intensity of economic relations between them (Bernardini 2017).[37] In addition, Russia was a leading trade partner from 2000 to 2013; it mainly imported agricultural products from and exported manufactured consumer goods to Azerbaijan. However, oil-led consumption in Azerbaijan shifted import patterns toward more competitive EU countries, such as the United Kingdom, Germany, and France (Pylin 2015).

The oil boom period coincided with the global financial crisis of 2008–2009, when Azerbaijan's oil exports to the EU significantly decreased due to general diminished consumption. Meanwhile, increasing economic activities in Asian countries such as Thailand, India, and Indonesia allowed Azerbaijan to dominate new markets (Pylin 2015). This was also made possible by its newly established marine infrastructure, which included 345 tankers. This played a crucial role in the country's foreign economic relations during the oil boom period (Pylin 2015).

Tahirova et al. (2021) highlighted Azerbaijan's increased propensity to trade with post-Soviet countries during the post-boom period. Thus, the potential to expand the structure and volume of foreign trade turnover between Azerbaijan and other post-

[36] Ibrahimova (2017) attributed this to the extensive development of agriculture, a lack of state support for some food products, and the development of agriculture that was in practice based only on domestic needs. Therefore, the production of agricultural products that were previously exported from Azerbaijian sharply decreased, and the full export potential of agricultural products was not achieved. These problems remain ongoing, and the crowding-out effects of the oil boom became more visible during the oil boom period.

[37] Bernardini (2017) also emphasized the role of the increased student exchanges between Azerbaijan and Italy. And there was an increase in Italy's cultural and artistic products to Azerbaijan.

Soviet nations has not been realized. To meet modern challenges, it is therefore necessary to develop and implement more adequate mechanisms and forms of partnership. Tahirova et al. (2021) cited bilateral meetings, business forums, and other events that are currently being conducted to increase the productivity of foreign economic relations and cooperation.[38]

During the post-boom period, Azerbaijan's foreign economic relations have reflected two major changes, namely governmental support to boost non-oil trade and national currency devaluation. Together, these changes may work in Azerbaijan's favor if appropriate industrial and other economic policies succeed. However, there is no guarantee that such reforms and changes will result in the development of non-oil tradeable sectors. This represents a missed opportunity to decrease the country's dependence on oil.

2.1.5. Creation of a private economy

In 1991, all former Soviet property in Azerbaijan was nationalized, but no individual restitution law was enacted (EBRD 1995). The main phase of privatization started in 1993 and continued for 11 years. More than 29,000 small and 1,500 medium-sized enterprises were privatized, whereas large state-owned companies were privatized slowly (Baranick–Salayeva 2005).[39] A delay in presidential approval for a new company law (passed by the parliament in spring 1993) significantly stalled the development of the private economy during the recession period (EBRD 1995). The government eliminated subsidized credits for SOEs from two major state banks, namely Agroprom and Prominvest, to help restructure and privatize SOEs (EBRD 1995).

Im et al. (1993) described the early features of privatization in Azerbaijan in a case-by-case approach that consisted of an annual multi-track path and considered various sizes of SOEs. This particular approach proved to be remarkably slow. The initial strategy was not mass privatization; rather, the main focus was on medium-sized and large enterprises, relegating small enterprises to future stages of privatization. The

[38] For example, on December 17, 2019, a bilateral business forum was held in Baku, where the most pressing problems and prospects to enhance the business environment between Azerbaijan and the Ukraine were discussed with the participation of the presidents of both countries. This event was attended by 100 companies from Azerbaijan and 90 companies from the Ukraine. Tahirova et al. (2021) also outlined Azerbaijan's increased cooperation with China, Kazakhstan, Belarus, Georgia, and Turkey via trade houses established in capital cities to promote mutual trade.

[39] The sluggish pace of privatization was also seen in the land and housing sectors, as the relevant legislation remained under development until 1993. Moreover, according to the EBRD (1995), most registered private enterprises were inactive.

government identified five main approaches for privatizing state assets: leasing, sales to labor unions, transfer of assets to a joint company, sales through tenders, and auctions (Im et al. 1993).[40] However, mass privatization was quicker as large and diverse groups of buyers could receive a substantial portion of public assets either for free or at a minimal charge through a voucher system (Lieberman et al. 1995). Indeed, the voucher system – introduced in Azerbaijan in 1996 – intensified the privatization process in Eastern European and FSU countries (Alexandrowicz 1994).

Despite abundant foreign assistance and the government's willingness to expedite the creation of a private economy, the recession period merely provided an introduction to the privatization process. Due to short-lived administrations, the government lacked the domestic capacity to systematically implement reforms. In addition, political and economic difficulties slowed the pace of privatization in Azerbaijan between 1991 and 1994, according to a World Bank (1995) report. Moreover, additional factors were required to ensure successful privatization: "[E]conomic reform, including creating conditions for a stable macroeconomic environment, trade liberalization, price liberalization, financial sector reform, elimination of subsidies, a pro-competition policy, and regulatory reform may be important elements in a successful privatization program" (Lieberman 1993: 15).

However, more successful privatization outcomes were observed during the recovery period. In 1995, then-president Heydar Aliyev signed the State Program of Privatization of State Property in the Republic of Azerbaijan in 1995–1998. The program institutionalized the privatization process, attempting to apply up-to-date lessons learned from other countries that had undergone a similar transition to a market economy. The voucher system was introduced to involve most of the population, while privileged sales to labor unions began to be regulated more systematically. From January 1, 1997, all Azerbaijani citizens received four vouchers that corresponded to one privatization share of state property. Overall, 32 million privatization vouchers were produced, accounting for 65% of state property.[41]

The second stage of privatization began in August 2000 when a law called "On Privatization of State Property" and the Second State Program of Privatization entered

[40] Other types of privatization included deep discounts, liberal arrangements for employee and management buyouts, transfers of the state property to entrepreneurs at book value, management contracts, leases, and contracting out state property.

[41] This paragraph is based on material entitled "Ten years of privatization in Azerbaijan," which the author is unable to cite due to numerous limitations (e.g., lack of author name, publication year, publishing house, etc.).

into force. The main difference between the first and second stages of privatization was the increased involvement of labor unions. In addition, the pace of privatization increased among small state enterprises and foreigners were allowed to participate.[42] Moreover, the second State Program not only focused on the transfer of state property to the population but also considered the development of businesses after privatization. Thus, tax and other benefits, loans on concessional terms, energy and gas supply, the writing off of debts to the state, and other benefits were offered to privatized enterprises.

During the early years of the recovery period, the private sector accounted for approximately 30% of GDP and 25% of employment (EBRD 1997).[43] The creation of a private economy was stimulated by cutting direct subsidies from the state budget in spring 1995, including subsidies for bread (EBRD 1995). Although the government's full attention was directed to the privatization of SOEs, its preparation for a market economy was slow due to a lack of corporatization, legal and regulatory frameworks, and low buyer interest arising from excessive privatization prices (World Bank 1995; 1996).[44] However, after the introduction of the privatization program in 1997, "1,065 medium-sized and large enterprises were transformed into joint-stock companies and privatized by the end of 1999" (EBRD 2000: 134). Moreover, in September 1998, the state implemented competitive tenders to increase case-by-case privatization. However, by the end of the first quarter of 2000, "only five companies had been privatised through this mechanism" (EBRD 2000: 134). Moreover, the establishment of the State Property Ministry in February 2000 and a new privatization law adopted in May 2000 failed to develop concrete and transparent processes to assist privatization (EBRD 2000). In addition, the validity of previously provided vouchers and options (the bulk of which were owned by foreigners) was extended beyond August 2000 (EBRD 2000).

Nevertheless, the recovery period delivered the most critical change in Azerbaijan's economy – namely the Land Reform Law of 1996, which turned land into

[42] During the second stage of privatization, foreign investors used options with vouchers to buy state property. According to the law (On Privatization of State Property), an option is a non-cash registered security that gives foreigners and investors the right to participate in privatization through vouchers. Accordingly, foreign investors participated in specialized check auctions by offering options. In addition, they were able to participate in privatization without providing options (at the expense of Azerbaijan's profits) when they reinvested their net profits into the country.

[43] This excludes enterprises with less than 50% private ownership. In addition, the EBRD (1997) reported that 40% of the GDP was privately produced based on the unofficial economy.

[44] In 1995 and 1996, the state's role in the economy was still too prominent, and the early years of the recovery period required an environment that was conducive to sustaining private sector development in Azerbaijan (World Bank 1996).

private property (Hasanov 2001). Under this law, 90% of arable land (22% of total land) was to be privately owned, 45% of total land was reserved for state ownership, and 33% was reserved for municipal ownership (EBRD 1997). Around 2000, the privatization of agricultural land and the issuance of land titles were nearly complete (EBRD 2000).

During the second half of the recovery period, the greatest challenge for the state was to improve the business environment. The EBRD (2005) reported that corruption was the main obstacle to the development of the private economy in Azerbaijan. An anticorruption law was adopted in 2005, but the EBRD (2005: 102) mentioned that its "implementation [was] still uncertain." The state's SME development initiative, which began in August 2002, aimed to eliminate unnecessary licensing and regulations as well as corruption and other barriers to growth in the private sector (EBRD 2003).[45] In addition, it was not only the private sector that struggled but also SOEs, which remained highly inefficient and opaque. Indeed, poor governance among SOEs was especially notable during the second half of the recovery period (EBRD 2005). In June 2005, the government declared that it would improve the supervision and financial discipline of crucial SOEs, including SOCAR. At the end of this period, the state adopted certain measures to address the slowdown in the development of the private economy. For instance, new antimonopoly legislation was introduced in July 2005. In addition, the World Bank assisted in the development of investment legislation and competition laws (EBRD 2005).

During the oil boom period, Azerbaijan's business environment significantly improved; however, entrepreneurial opportunities in the private share of non-oil sectors remained scarce due to the strong positions of monopolies, restricted entry to various economic sectors, corruption, and bureaucratic delays (EBRD 2008). The World Bank's "Doing Business 2009" report ranked Azerbaijan as one of the top countries for reforming its business environment among 181 economies. In January 2008, "one-stop shops"[46] were established to simplify business registration and licensing procedures; by then, the number of registered firms had already dramatically increased (EBRD 2008). During the first half of the oil boom period, electronic tax filing was introduced and the process of registering real estate was simplified (EBRD 2008). In addition, starting from

[45] It was anticipated that the newly formed Business Council would provide suggestions to further boost the investment climate during the second half of recovery period (EBRD 2003). In the end, the oil boom made privatization efforts less important because officials were more interested in the oil rents.
[46] In previous years, entrepreneurs had to visit several governmental units to register and start their businesses. This situation led to numerous corruption cases in Azerbaijan.

2008, the use of international financial reporting standards (IFRS) was made obligatory for all large companies (EBRD 2008). All of these measures improved Azerbaijan's business environment and supported the creation of a private economy.

However, the World Bank's (2009) Enterprise Surveys Country Note Series reported several persistent systemic flaws that hindered the development of the private economy. Specifically, domestic firms still faced greater oppression and discrimination from government officials (e.g., bribery and unnecessary tax controls) than foreign companies during the oil boom period, in addition to gender discrimination (e.g., female-run firms received fewer visits from officials than male-run firms). However, the same report also indicated a significant decrease in corruption and improvement in access to finance in 2009 compared with 2005. In addition, the main impediment for Azerbaijani entrepreneurs was difficulties in securing initial investors, partners, and funding to start a business (Kuriokose 2013). Failing was also problematic, as changing taxation regulations and bankruptcy legislation were among the most critical legal and regulatory constraints that discouraged entrepreneurs from pursuing their ideas in the Azerbaijani market. Based on other findings and recommendations from Kuriokose (2013), it could be argued that the Azerbaijani government did not really engage in reform to boost high-growth entrepreneurialism, which could have also assisted non-oil diversification. Instead, the oil boom was the government's main focus since it was the major contributor to the economy. Meanwhile, a lack of competition, risk capital, and industry-relevant skills led to the stagnation of entrepreneurship.

The second half of the oil boom period was notable due to rapid developments in the information and communication technologies (ICT) sector, which became the second-largest industry to receive foreign investment after the oil industry. This stimulated the development of a private economy, especially in non-oil manufacturing. The EBRD (2014) reported an average increase of 25–30% between 2003 and 2013. "In July 2014 the State Fund for the Development of IT, which was established in 2012, awarded grants to 31 start-up projects in areas such as high-technology, e-payment software applications, air navigation systems and e-government" (EBRD 2014: p. 97).

In 2014, the drop in oil prices led government officials to redress the imbalance by pursuing diversification, investing in physical and human capital with greater participation from the private economy, and raising awareness about the fragile status of Azerbaijan's economic structure (World Bank 2019). "Article 14 of the Law of the Republic of Azerbaijan on the State Budget of the Republic of Azerbaijan for 2021 states that the financing of the state budget deficit should be carried out through privatization and revenues from other sources" (Ibadoghlu 2021). In fact, during the early years of the post-boom period, the government rapidly remapped new policies to stimulate privatization. On May 19, 2016, President Ilham Aliyev signed a decree to improve the privatization of state property. It established new privatization methods, such as individual project-based privatization[47] and investment competition[48] (Ibadoghlu 2021). Furthermore, the Cabinet of Ministers was instructed to develop and submit the new Draft Law of the Republic of Azerbaijan on the Privatization of State Property. After five years, the Cabinet still had not provided a reworked legal framework for regulating the new phase of privatization (Ibadoghlu 2021). In addition, new attempts to privatize SOEs continued to fail due to their economic unattractiveness (Ibadoghlu 2021). For example, Dashkasan Filizsaflashdirma OJSC had more than 270 million tons of iron ore reserves and was considered one of the most strategic SOEs in the non-oil extractive industry. The Azerbaijani government invited potential investors from the USA, the EU, the United Arab Emirates, and India and assigned the private organization KPMG[49] as a private advisor (emlak.gov.az 2019). The deadline for applications and offers was May 31, 2018; however, as of today, Dashkasan Filizsaflashdirma OJSC has not been privatized. Its case highlights the challenges of the new privatization phase, which is strongly interlinked with the institutional and governance failures in Azerbaijan's economy that began during the oil boom period (Ibadoghlu 2021).

In October 2016, the Cabinet of Ministers decided to provide subsidies for several export products in non-oil sectors from March 1, 2017 to December 31, 2020 (Ibrahimova 2017).[50] In addition, tax reforms entered into force in January 2019. They were intended to improve transparency and accountability as well as to encourage

[47] Individual project-based privatization is a process that tries to identify appropriate investors via proposed projects that take into consideration the features of the enterprise and it addresses the government's planned goals.

[48] Investment competitions combine a limited version of some forms of demand, forcing the state to stimulate private capital investment in exchange for low profits. Thus, when property is sold through investment competitions, the investor undertakes a three-, five-, or sometimes even 10-year investment commitment to develop the enterprise. By applying an effective control mechanism to the fulfillment of investment obligations, it may require the modernization of an owned enterprise based on financial investments and the effective organization of its activities.

[49] Klynveld Peat Marwick Goerdeler (KPMG) is one of the big four multinational accounting organizations.

[50] This law covered 25 commodity items, of which six (except for naphthalene ointment) were light industry products, while the others were food products. The latter included natural honey, dried fruits, national sweets, spices, fruit and vegetable juices, canned food, fresh fruit, mineral waters, grapevines, and other alcoholic and non-alcoholic drinks (Ibrahimova 2017).

businesses to formalize (i.e., emerge from the shadow economy) and participate in economic diversification.[51] Thus, the tax rate for micro-, small, and medium-sized enterprises (MSMEs) was reduced from 4% to 2%.

Moreover, the regional support infrastructure for SMEs was strengthened (EBRD 2020: p. 3) during the post-boom period. In early 2020, Azerbaijan's newly founded Agency for the Development of SMEs launched the inaugural House of SMEs. This platform, based in Khachmaz in the northern part of Azerbaijan, gathers government and private sector services in a single location. These services include assistance with the development of business and marketing plans; business knowledge enhancement; and the acquisition of registration and various licenses to access financial resources, supply chain and infrastructure networks, domestic and foreign markets, and trade facilitation. The post-boom period has also been memorable due to an extended development program called the Regional State Development Program of the Azerbaijan Republic on Economic and Social Development for 2019–2023. The program includes several measures designed to stimulate export-oriented entrepreneurship and increase local employment and production among others (Niftiyev 2020a).

2.2. Macroeconomic overview of Azerbaijan's economy

During the recession period, Azerbaijan's economic growth was −16.4% and its per capita GDP was USD 142.3 per annum (see Table 2.1). The first half of the recovery period saw a GDP growth rate of 2.5%. Between 2000 and 2004, Azerbaijan's GDP rose by 10% and continued to exhibit strong growth during the first half of the oil boom period, reaching 18.8% between 2005 and 2010. However, the second half of said period saw a growth rate of 2.3%. The international commodity price downturn severely affected Azerbaijan's economy during the post-boom period, which led to a growth rate of −0.4%. Similarly, as Table 2.1 indicates, the per capita GDP recovered during the recovery period, achieving a 17.1% growth rate between 2005 and 2010 compared with −17.8% during the recession period. Therefore, the greatest jump in per capita GDP occurred during the first half of the oil boom period, while the second half brought a

[51] In January 2020, President Ilham Aliyev said that, owing to the "fight against the shadow economy," tax authorities collected AZN 120 million in addition to the forecasted amount, and customs authorities collected AZN 40 million.

sharp decline (albeit with 1% growth). However, the post-boom period was characterized by a significant slowdown in per capita GDP (−1.3%).

Table 2.1: Selected economic indicators for Azerbaijan (1991–2020).

	Recession period	Recovery period		Oil boom period		Post-boom period
	1991–1994	**1995–1999**	**2000–2004**	**2005–2010**	**2011–2014**	**2015–2020**
Growth						
GDP (current prices, billions of USD)	0,802	3,717	6,635	35,555	71,261	44,950
GDP growth (% per year)	−16.5	2.5	10.0	18.8	2.3	−0.4
GDP (USD, constant 2015)	14,536	9,521	14,715	37,689	49,422	52,206
Per capita GDP (USD, current prices)	142.3	473.0	810.1	4,045.2	7,259.3	4,548.0
Per capita GDP (USD, constant 2015)	1,964.2	1,213.8	1,797.8	4,306.5	5,315.2	5,280.6
Per capita GDP growth (% per year)	−17.8	1.5	9.1	17.1	1.0	−1.3
Economic openness						
Exports (% of GDP)	53.5	27.4	43.0	61.5	50.3	45.3
FDI (% of GDP)	N/A	19.1	31.7	15.0	6.0	6.5
Terms of trade[1]	N/A	N/A	97.5	157.0	200.3	126.3
REER[2]	22.6	87.9	79.8	106.5	133.8	98.9
Structural change (value-added, % of GDP)						
Agriculture, forestry, and fishing	29.0	21.4	13.7	6.7	5.2	5.9
Manufacturing	17.3	8.9	7.2	5.4	4.3	5.0
Industry (including construction)	31.5	35.4	46.3	61.9	58.0	47.4
Services	34.3	37.4	33.3	25.6	30.7	38.8
Oil rents[3] (% of GDP)						
Oil rents in Azerbaijan	10.6	13.1	25.1	33.9	26.0	18.1
Average oil rents in Azerbaijan between 1991 and 2019			21.7			
Average oil rents in other oil-rich post-Soviet countries[4]	5.8	7.5	18.1	18.1	13.7	8.9

Source: World Bank, World Development Indicators.

Notes: "N/A" means "not applicable"; GDP = gross domestic product; FDI = foreign direct investment; all numbers are rounded up to the first decimal place.

[1] In percent. Base year is 2000 or 2000 = 100%.

[2] In percent. Base year is 2007 or 2007 = 100%.

[3] Oil rents are the difference between the value of crude oil production in regional prices and total costs of production.

[4] The oil-rich post-Soviet countries are Azerbaijan, Kazakhstan, Russia, Turkmenistan, and Uzbekistan.

As a percentage of GDP, exports grew from 27.4% to 43% during the second half of the recovery period (between 2000 and 2004), peaking at 61.5% between 2005 and 2010. Exports also accounted for a high percentage of GDP (50.3%) during the second half of the oil boom period due to increased oil exports. However, they accounted for 45.3% of GDP during the post-boom period, which meant a decrease in export growth. Moreover, the positive trend of FDI in Azerbaijan's economy began to decline during the oil boom period, largely due to the completion of upstream and downstream projects in the oil industry; it bottomed out at 6% of GDP between 2011 and 2014. In addition, a similar level of FDI flows was observed during the post-boom period (6.5% of GDP). TOT and the REER exhibited significant upward trends during the recovery period, but both indicators rapidly decreased during the post-boom period; TOT was 200.3% from 2011 to 2014 and dropped to 126.3% from 2015 to 2020, while the REER was 133.8% from 2011 to 2014 and declined to 98.9% from 2015 to 2020.

In terms of structural changes in Azerbaijan's economy, the share of total value-added in the agriculture, forestry and fishery, and manufacturing sectors decreased from the recession period to the post-boom period. However, due to both the extractive sectors and the construction boom, the industrial sector's share of total value-added rose to 61.9% from 46.3% during the oil boom period. Moreover, the service sector's share of total value-added ranged from 25.6% to 38.8% between 1991 and 2020.

Lastly, because of the high shares of oil rents in the economy, Azerbaijan can be considered an oil-dependent country (see Table 2.1). In each developmental stage of the economy, oil rents have occupied a higher percentage of GDP compared with other oil-rich countries in the post-Soviet space. Between 1991 and 2020, oil rents accounted for 21.7% of GDP per year on average; this threshold was surpassed during the second half of the recovery period and during the oil boom period.

Table 2.2 presents the polarized structure of Azerbaijan's economy in terms of overall investments, employment, output, and trade. More specifically, the oil boom (63.90%) and post-boom periods (61.20%) were marked by the mining industry's dominance in both the national economy and FDI. However, investments in the manufacturing industry sector nearly doubled during the post-boom period compared with the oil boom period.

Furthermore, the employment section in Table 2.2 indicates the mining industry's declining share in total employment. This highlights its capital-intensive nature and the low levels of benefit that can be obtained from this industry in terms of salaries and wages. Nevertheless, the agriculture and service sectors are the two largest employers in Azerbaijan. The service sector has continued to occupy the highest share of total employment since the beginning of the recovery period.

In terms of the structure of industrial output, the mining industry and the manufacture of refined petroleum products reached 84.27% during the oil boom period, 61.12 and 19.16 percentage points higher than during the recession and recovery periods, respectively. However, non-oil manufacturing accounted for 66.10% of total industrial output during the recession period, falling to 19.59% during the recovery period. During the oil boom period, this figure further decreased by 9.52 percentage points. Only the post-boom period saw an increase in non-oil manufacturing, which is mainly attributable to the mining industry's lower output due to the end of the commodities boom.

Table 2.2: Structure of Azerbaijan's economy in term of investments, employment, industrial output, and trade (in %).

	Recession period	**Recovery period**	**Oil boom period**	**Post-boom period**
	1991–1994	**1995–1999**	**2000–2004**	**2005–2010**
Overall investments				
Mining	–	–	63.90	61.20
Manufacturing	–	–	14.20	26.70
Employment				
Mining industry	–	1.04	0.99	0.81
Manufacturing industry	11.20	4.87	4.92	5.14
Agriculture	32.60	35.86	37.96	36.26
Services	43.30	51.26	56.13	57.78
Industrial output				
Mining industry and manufacture of refined petroleum products	23.15	65.11	84.27	75.36
Manufacturing industry	66.10	19.59	10.07	18.66
Other	10.75	15.30	5.66	5.98
Trade (exports)				
Manufacturing industry	–	10.50	4.70	4.00
Agriculture	–	4.80	4.20	4.30
Other	–	0.00	0.20	0.80

Source: State Statistical Committee of the Republic of Azerbaijan.
Notes: (i) The category "Other" under "Industrial output" includes electricity, gas, and steam production; the distribution of supply; water supply and waste treatment; and disposal; (ii) total values may not equal 100% in all cases because some calculations excluded categories such as "Other"; (iii) the recovery period only encompasses the period 1999–2004 due to data limitations; (iv) under "Trade (exports)," the recovery period begins in 1996; (v) under "Trade (exports)," the category "Mining industry" includes inedible crude materials; (vi) under "Trade (exports)," the category "Other" includes commodities that are not included in the structure of exports according to the Standard International Trade Classification (SITC).

Lastly, the trade structure of Azerbaijan's economy indicates that the oil-based mining industry had the largest share in exports while manufacturing bottomed out at around 4% during the oil boom and post-boom periods. In addition, the agriculture sector has not exhibited any increase in exports since the oil boom.

2.3. Summary of the chapter

This chapter summarized the main stages of the development of Azerbaijan's economy in terms of macroeconomic stability and stimulation, institution building, liberalization of the economy, foreign economic relations, and creation of a private sector. The modern economic development of Azerbaijan can be divided into four distinct developmental stages, namely the recession period (1991–1994), the recovery or restructuring period (1995–2004), the oil boom period (2005–2014), and the post-boom period (2015–2020). Despite limited information on the recession and post-boom periods, it can be said that Azerbaijan survived the severe economic downturn of the recession period and began to rapidly recover from the devasted economy during the restructuring period. The impact of the oil boom on Azerbaijan's economy was more clear cut compared with the previous two stages, leading to the mining industry's increased share in investments (both domestic and FDI), employment, output, and exports. This structural imbalance has created a set of challenges that are currently being investigated in diversification studies on Azerbaijan's economy (Bayramov–Abbas 2017; Guliyev 2020; Ahmadova et al. 2021; Hamidova 2021).

Oil-based economic development fueled economic indicators such as GDP, GDP per capita, FDI, and exports. However, long-term sustainable economic growth and development, which could reduce a country's dependence on volatile commodity markets, have not been achieved. Oil prices determine the trajectory of the main macroeconomic indicators and the structural distribution of Azerbaijan's economy, which in turn makes balanced development uncertain. Issues related to crucial policy reforms and institutional governance either stop or fall to the wayside when oil prices rise. Shortsightedly, the Azerbaijani government increased its efforts to reform institutions and governance only when oil prices were low. However, when oil revenues have risen, this has led to a disinclination among government officials and politicians, creating a gap in the reform agenda. In such circumstances, macroeconomic instability, institutional deficiency, a lack of political will and plans for liberalization, and underdevelopment of the private economy in Azerbaijan have allowed DD and the NRC to grow. Therefore, the next chapter is an empirical test of the NRC phenomenon as a prerequisite for an economic explanation, which is DD. Therefore, the next chapter is an empirical analysis of the NRC phenomenon in Azerbaijan. This needs to be done before the theory of DD can be used to provide an economic explanation for the negative effects of the oil boom.

CHAPTER 3

LITERATURE REVIEW

3.1. Natural Resource Curse phenomenon

The term NRC refers to the slower economic growth of resource-rich countries relative to resource-poor countries (Auty 1993). Numerous studies have provided a solid foundation for resource curse-related studies, enabling an enhanced understanding of the economic structure of resource-rich countries relative to resource-poor countries. NRC theory has been discussed since 1970; pioneering papers were by Sachs and Warner (1997; 1998; 1999; 2001), who found an inverse relationship between natural resource abundance and resource dependence,[52] and GDP performance in cross-country studies. They also highlighted the fact that mineral-rich countries tend to be expensive countries, which hinders export-led industrialization in the long term. Furthermore, Auty (2001) revealed that income per capita growth was higher in resource-poor countries than resource-rich countries between 1960 and 1990. In fact, among the largest mineral exporters, the annual GDP per capita growth rate decreased from 1980 to 1993 following the boom period of 1970 to 1980 (Mikesell 1997).[53] Mikesell (1997) also noted that the average annual GDP growth rates of mineral exporters declined after commodity prices collapsed from 1980 to 1993. In a more recent study, Sharma and Pal (2020) found evidence for the existence of the resource curse phenomenon in the short and long term based on a panel of 111 countries from 1996 to 2015. They observed a negative impact of resource dependence on economic growth.

If a downward trend occurs in main commodity prices in the long term, then the NRC may pose a serious threat to mineral-rich countries (Arezki et al. 2014). This could lead to trade deterioration or simply the contraction of mineral revenue.[54] A growing body of literature related to the NRC and DD has cited other risks. For instance, through

[52] A country is considered to be abundant in natural resources if more than 40% of its national income is generated by extractive industries, according to Auty–Warhurts (1993). Sachs and Warner (1997) calculated resource dependence as the ratio of primary exports over GDP.

[53] The exceptions are Chile, Jamaica, Papua New Guinea, and Oman.

[54] Prebisch (1950) and Singer (1950) formulated the first notable hypothesis regarding the negative long-term trend in raw material prices. Since then, numerous debates have taken place on this topic. For example, Frankel (2012) argued that the resource curse is not well suited to the Prebisch-Singer hypothesis because a consistent negative trend in commodity prices is not observed. However, in contrast to Frankel (2012), Harvey et al. (2010) found a negative trend in major commodity prices in the long run (which supports the Prebisch-Singer hypothesis), but not every commodity displayed a negative trend. Some commodities did not show any trend at all in Harvey et al.'s (2010) study.

the effects of DD,[55] REER appreciation significantly reduces the productive capacity of non-resource tradeable sectors (Krugman 1987), encourages corruption, and decreases bureaucratic quality (Busse–Gröning 2013). The resource curse also hinders knowledge accumulation and capital formation (Welsch 2000), which harms education levels as the need to invest in education to provide specialized human capital to crowded-out manufacturing sectors is reduced (Wadho 2014). Moreover, a study found that "knowledge accumulation and capital formation are inversely related to the natural-resource intensity"[56] (Welch 2000: 62).

Some countries, such as Norway, Botswana, Indonesia (Gurbanov–Merkel 2009), Chile (Havro–Santiso 2017), and Iceland (Gylfason–Zoega 2006), have managed to increase their economic growth and distribute their natural resource revenues more or less well by minimizing the negative impacts of resource abundance through institutional arrangements. Nevertheless, their structural problems and social challenges remain to some extent. Thus, general claims of the existence of the NRC in a country or region should be handled very carefully. If institutions function well and the state distributes income equally and efficiently, natural resources may be a blessing rather than a curse, boosting economic growth (Acemoglu et al. 2005). However, if a country becomes dependent on a single commodity as a source of revenue during its developmental stages and has weak institutions, macroeconomic destabilization may be inevitable due to volatile commodity prices and political challenges (Venables 2016).

Furthermore, the effects of the NRC may vary over time. For instance, Collier–Goderis (2007) demonstrated that the short-term effects of commodity booms may be positive, but their long-term influence may be very harmful. Hence, the resource curse thesis may be more visible over a long time span than over a short one. Thus, policymakers should focus on long-term policy solutions to lessen the NRC's effects.

Although a popular field of research, NRC theory must be investigated against a variety of theoretical considerations to more accurately establish the interplay between resource wealth, economics, and politics (Torvik 2009). Azerbaijan is no exception—its economy heavily depends on the oil and gas sector, while non-oil manufacturing has

[55] According to Corden and Neary (1982), Corden (1984), and Brahmbhatt et al.'s (2010) original theory, the DD phenomenon results from structural change caused by the discovery of large mineral resources or extractive industry-based development. DD means a loss of competitiveness due to an appreciated real exchange rate, a productivity decrease in non-mineral sectors, and heavy dependency on state expenditures.

[56] Here, natural resource intensity measures the efficiency of the resource use spent to produce one unit of GDP (Lorentzen 2008). Resource-rich countries are considered to be highly resource-intensive, as GDP heavily depends on resource extraction and exports.

decreased and become reliant on government subsidies (Niftiyev 2020c). Moreover, as the main objective of the present study was to examine economic policy solutions to deindustrialization in Azerbaijan, an investigation of the resource curse thesis could answer frequently asked research questions about Azerbaijan's economy. Theoretical, descriptive, and empirical studies are not conclusive on this topic. Each successful year offers a casual glance through the lenses of various determinants of the NRC, which must be analyzed to obtain an understanding of the topic.

3.1.1. Main concepts, key terms, and NRC measurement approaches

With regard to NRC syndrome, the primary interest lies in understanding the impact of natural resources—especially sub-soil hydrocarbon resources such as oil—on economic growth. Natural resources affect economic growth through both macroeconomic indicators (directly) and social institutions (indirectly; Gylfason–Zoega 2006). Favorable commodity prices boost the flow of mineral revenue into the exporter country. However, as soon as prices noticeably decrease, the country will experience macroeconomic challenges that can leave lasting scars. Moreover, if the country suffers from corruption, inefficient government spending, low human capital (assets), and rent-seeking behavior from politicians, slower growth will be compounded.

To test the relevance of NRC theory to Azerbaijan's economy, appropriate variables first needed to be chosen. Concepts such as "natural resource-rich" and "natural resource-poor" countries must be clarified, as the appropriate use of terminology is critical in any theoretical analysis. To understand the NRC doctrine, it is crucial to define the term "natural resource capital," which encompasses not only natural resource stocks (renewable and non-renewable) but also land and ecosystems (OECD 2011a). In general, NRC studies cover a mineral resource that enters non-renewable natural resource stocks (OECD 2011b). The concept of natural resources has a broad meaning, namely the natural and environmental resource wealth available to an economy (Barbier 2002: 488); however, Ross (2013) claimed that the resources curse only applies to oil resources that have fostered authoritarian governments and civil wars in developing or underdeveloped countries since the 1970s. According to Ross (2013), four aspects of oil lead to the resource curse: large rents, unusual sources of government revenue, secrecy, and volatile prices.[57] Sala-i-Martin and Subramanian (2003), Murshed

[57] Extractive industries generate enormous amounts of income within a short time period, which in turn increases the scale of the government revenue and expenditure. Ross (2013) evaluated extractive

(2004), and Isham et al. (2005) have also made similar arguments—that the central role of point-source natural resources in the economic structure is the main reason for NRC syndrome.

Point-source natural resources refer to dense concentrations of resources (e.g., oil and minerals) on a geographically narrow scale, as opposed to diffuse resources that encompass wider areas such as forests (World Trade Organization 2010). Statistical evidence suggests that point-source natural resources indirectly hinder economic development through institutions as they are easier to capture and control—especially in non-democratic regimes (Isham et al. 2005; Mehlum et al. 2006; Wick–Bulte 2009). Therefore, NRC theory is heavily skewed toward mineral-rich countries. However, it is not limited to energy resources.[58]

If more than 10% of a country's GDP is based on the mining sector and more than 40% of foreign earnings are derived from mineral revenue, then that country can be viewed as a mineral-rich, resource-rich, or resource-abundant country (Auty–Warhurts 1993). However, the NRC doctrine is not applicable to every single resource-abundant country. Rather, chronic resource dependency (economic channel), sociopolitical conditions, and institutional failures are the factors that can hinder a country from overcoming the effects of the NRC, thus establishing long-term sustainable economic development.

Sachs and Warner (1997) defined "resource dependence" as the ratio of primary products to the gross national product (GNP) of a country.[59] If a country is resource-abundant, then a high probability exists that the government will side with increasing extraction and exports to benefit from boom periods in international commodity cycles. However, Ding and Field (2004) presented an argument regarding the objective preconditions of natural resources for influencing the economic structure. In other words, a country's economic structure simply responds to the technological capacities to transform natural resource stocks into economic growth. Hence, key terms, definitions, and naturally the resource types are vital for concluding economically

industry-generated rents as non-tax revenue (but his approach is non-specific). Oil prices are extremely volatile, which creates considerable uncertainty for national economies; Ross (2013) argued that "secrecy" referred to hiding oil revenue from the public in offshore accounts.

[58] As cited in Vahabi (2018), scholars have suggested including forest resources (Price 2003; Harewell, Farah and Blundell 2011), non-fuel natural resources (Sorens 2011), and overall commodities (Besley and Persson 2011; Bazzi and Blattman 2014) to capture the broader impact of natural resources.

[59] By "primary products," Sachs and Warner (1997) mainly meant produced, extracted, or cultivated goods and services. Moreover, Ding and Field (2004: 3) viewed this index as misleading, because "[i]t registers primarily the sectoral importance of primary industries, in the economy and in terms of exports."

meaningful results. Thus, distinctions among the conceptual dimensions of NRC theory and spillover effects among natural resource types should be made to capture relevant effects on the economy (Blanco–Grier 2012). If the definitions and economic conditions of a particular resource-rich country mean that it is likely to fall under the NRC doctrine, then policy failures that originate from political and institutional channels can carry negative connotations of its resource-abundance.

Negative perceptions of natural resource abundance are relatively novel. Rosser (2006a) chronologically outlined the evolution of how natural resources are perceived; a positive, growth-enhancing perception was observed between 1950 and 1980, while the NRC doctrine gained more credence after 1980. Economists such as Lewis (1955), Rostow (1960), Rostow (1961), Watkins (1963), Innis (1963), Kruger (1980), and Balassa (1980) defended the soundness of extractive-led industrialization by citing historical development patterns and the natural evolution of advanced national economies. In addition, accumulated mineral revenue boosts economic growth and reduces credit constraints, eventually leading to take-off among low-income countries. Notably, countries rich in natural resources can experience a "big push" to alleviate poverty and prepare themselves to produce high value-added products (Rosenstein–Rodan 1943). The relevance of extractive-led industrialization is indicated by the examples of the United States (De Long–Williamson 1999), the United Kingdom (Van Neuss 2015; Stevens 2015), Australia (Lowe 2012), and Norway (Fagerberg–Mowery–Verspagen 2009; Ville–Wicken 2013). However, the following questions arise: Is this approach to the role of natural resources in economic growth and development since the 1980s still pertinent?[60] Furthermore, are natural resources conducive to industrialization in developing, resource-rich, low-income, and transitional countries? According to Ali et al. (2018), natural resources, especially oil endowments, appear to fail to make citizens happy in oil-rich countries; in other words, there is an inverse relationship between oil rents[61] and happiness.

Ali et al.'s (2018) observation enables the most critical intellectual premise of NRC theory to be examined, namely the relationship between quality of life (in economic terms) and oil wealth. It is not sufficient to examine the associations between

[60] After the 1980s, an overall negative trend in commodity prices was limited to be as flexible as the period of pre-80s provided. Moreover, since the 1980s there is more data to decide whether mineral-richness had led to civil wars, the crowding-out process of the non-mineral productive sectors, or other effects that are traditionally assigned to the resource curse doctrine.

[61] According to the World Bank (2020), "oil rents are the difference between the value of crude oil production at world prices and total costs of production."

economic growth variables, such as GDP, GDP per capita, GDP growth, income levels, and resource abundance (or dependence). Instead, specific target variables should be studied, such as political and institutional attributes, human capital development, bureaucratic quality, and the drive to integrate the extractive industry into the rest of the economy. To this end, resource curse-related studies must address the direct and indirect impact channels (i.e., transmission channels) of natural resources. Thus, the following sections outline the most relevant channels in the context of NRC theory and the transmission channels of the NRC before empirically testing the theory's relevance in the case of Azerbaijan, a small, oil-rich, and post-Soviet country.

The definition of resource abundance itself presents a challenge when selecting a measurement level to capture its effects. As cited by Stevens (2015), the most popular measures of natural resource abundance are dependence on primary products (Sachs–Warner 2001), per capita land area (Wood–Berge 1997), employment in the primary sector (Gylfason et al. 1999), export concentration, and population (Syrquin–Chenery 1989).

The type of natural resource is also relevant, as cross-country studies have demonstrated. When measuring diamond production, for example, resource abundance is positively and significantly related to income growth, whereas oil abundance (as measured by oil production) is not significantly related to growth (Daniele 2011). Ores and mineral resources do not appear to significantly impede or harm growth as measured by economic indicators; however, negative influences on fuel resources and standards of living have been found, as measured by GDP per capita and the human development index (HDI; Pendergast et al. 2011). Resource dependence measured by the share of metals and ores in total exports has a strong and significant relationship with average growth (Daniele 2011). Furthermore, Stiglitz (2005) suggested using green GDP to measure sustainable growth against resource depletion, because understanding how a country grows richer or poorer in terms of how exhaustible resources affect the environment is crucial.[62]

In the NRC literature, the other most critical factor in terms of impact channels is oil prices (or commodity prices). The role of oil prices in export revenue and fiscal spending is critical in oil-rich countries and leads to procyclicality (Bova et al. 2018). Positive oil price shocks or oil price upturns increase GDP growth, which Brückner et

[62] Stiglitz (2005) argued that green GDP is a key indicator for measuring sustainable growth dynamics and that it should be included in theoretical and empirical research on resource curse topics.

al. (2012) argued also supports democratic transition. However, negative oil price shocks undermine the financial development of resource-rich countries, which in turn increases their dependence on resource exports (Mlachila–Ouedraogo 2020). A strong dependence on oil prices places oil-exporting countries in a vulnerable position in the face of oil price fluctuations; for example, between 1990 and 2014, such dependence in regions such as Sub-Saharan Africa led to lower GDP growth rates, unstable political indicators, and a deterioration in human capital assets (Vandyck et al. 2011). Consequently, a general tendency seems to exist that oil reserves and increased oil production and mineral exports are followed by signs of the NRC.

Sachs and Warner (1995) pioneered research on the NRC by documenting an inverse, significant, and robust association between resource-based exports[63] as a share of GDP and economic growth. As the body of literature grew, various frameworks and characteristic features emerged to explain NRC theory in resource-abundant economies. According to Torvik (2019), the following indicators should be followed to understand the NRC: DD, rent-seeking, the political economy, civil conflicts, large public sectors, and huge, economically inefficient, but politically beneficial domestic investments. Moreover, Gylfason–Zoega (2006) found an inverse relationship between natural resource dependence and economic growth.

Although pioneering studies have argued that an adverse relationship exists between natural resource abundance and economic growth, the findings are mixed regarding the impact of mineral resource wealth on economic growth and development. Some studies have found negative effects, while others have found the opposite—how can this be the case? According to Havranek et al. (2016), the reasons depend on the heterogeneity of the data and methods applied. Furthermore, NRC syndrome strongly depends on how it is measured and how economic growth is modeled (Rambaldi et al. 2020). Moreover, resource dependence and the distinction between resource types, investment levels, and institutional quality influence the relationship between resource abundance and economic growth (Havranek et. al 2016). In a recent study, Shahbaz et al. (2019) re-examined NRC theory retrospectively in terms of resource abundance and dependence for the period 1980–2015 in 35 countries. They concluded that resource abundance leads to economic growth, while resource dependence negatively affects the real GDP of mineral-rich countries. Nevertheless, although research related to slower

[63] Resource-based exports include agriculture, minerals, and fuels.

growth resulting from mineral richness has rapidly evolved and provided empirically sound evidence for the NRC, the methodologies applied and the cause–effect relationships remain ambiguous (Davis–Tilton 2005). However, new case studies may accelerate our understanding of the NRC.

In addition to the types of data used to analyze the NRC doctrine, the type of resource is another integral part of the analysis. Natural, physical, and human capital contribute to human welfare through the production function of the national economy (Barbier 2002); however, different types of natural resources may affect standards of living, economic growth, and welfare differently. If certain regulatory and institutional preconditions do not exist, adverse effects or suboptimal performance may be inevitable. However, the resource curse does not only concern the negative association between natural resource abundance/dependence and income levels. Wick and Bulte (2009) noted that the NRC includes several aspects. For instance, developmental indicators such as the HDI, life expectancy, hunger, and undernourishment may be suitable as alternative measures of resource abundance. Similarly, Gylfason–Zoega (2003: 288) demonstrated that natural resources impede growth and increase inequality: "[I]f the distribution of ownership of natural resources is more unequal than the distribution of other forms of wealth, the inequality of the distribution of income, education or land is directly related to the share of natural resources in national income." Moreover, Pendergast et al. (2011) reported that higher corruption and rent-seeking are associated with fuel resources, while forest resources attract fewer rent-seeking behaviors and corruption. According to Williams (2011), countries rich in point-source resources are less transparent, as measured by the Release of Information Index. In addition, transparency issues are the direct result of resource revenue as they tend to endanger sustainable economic growth.

Another key concept in natural resources originates from the work of Boschini et al. (2007: 2), who introduced a new classification system of resource abundance called "appropriability." Appropriability means "how easy it is to realize large economic gains, within relatively short period of time, from having control over it." In other words, resource abundance in itself is not harmful to economic growth; rather, other factors such as technical and institutional appropriability determine the fate of resource utilization. Technical appropriability means that certain resources (e.g., diamonds) tend to produce rent-seeking behaviors because they are easy to store and transport. Institutional appropriability means the ability to regulate and control all relevant aspects of resource production and revenue for positive economic growth, rather than for negative economic growth.

In the next section, a brief cross-country survey clarifies how an Azerbaijan-specific analysis can be developed using the available literature and statistical data. It also outlines the main transmission mechanisms in NRC theory described in the literature.

3.1.2. Main transmission channels and mechanisms in the NRC doctrine

While some resource-rich countries have managed to diversify their economies (e.g., Norway and Chile), many still struggle to do so. When countries fail to address institutional, governance, and human capital challenges, they tend to experience the NRC (Gelb 2010). This is part of a larger problem known as the "rent curse" (Auty–Furlonge 2019). To assist in the diagnosis of NRC syndrome, it is crucial to trace its exact pathways, transmission channels, and mechanisms.

The literature provides a wide range of examples that assist in analyzing alternative channels and diagnosing the NRC phenomenon. According to Karabegović (2009), there are three main transmission channels for the resource curse, namely economic, political, and institutional. The economic channel mainly includes the effects of DD. By contrast, the political and institutional channels are characterized by a low propensity to tax non-resource sectors, which creates social groups uninterested in political accountability. It also creates a wealthy elite who resist reforms and transformation and seek to establish long-term sustainable development (i.e., rent-seeking). In addition, as a transmission channel, public investments and the capacity to manage oil revenue represent the overall situations in resource-rich countries, enabling one to understand whether windfall gains[64] explain why they fail to achieve long-term sustainable growth and development.

3.1.2.1. Role of resource rents and their political and institutional dimensions

The NRC literature features a plethora of economic explanations of resource rents. Based on Gelb's (1988) work, Deacon (2011) argued that conventional economic explanations of lagging growth within the NRC doctrine fail to capture the big picture. Thus, a rentier state model or the rent-seeking behavior of states helps to explain the

[64] Windfall profits are unexpected increases in income for a commodity-exporting economy that may be due to unforeseen factors such as price increases in international commodity markets. Windfall profits are temporary in nature; as long-term observations have shown.

institutional and policymaking aspects of slower growth (Di John 2011). According to Heller (2006), an analysis of resource-rich countries should focus on political institutions to understand the success or failure of managing commodity revenue. Political and institutional explanations of the NRC attempt to account for the possible sources of slower or lagging growth in non-resource sectors. Political and institutional factors are considered the most significant transmission channel because resource-rich countries are likely to experience boom after-effects.

Therefore, the question arises of whether resource abundance leads to substandard institutions or, conversely, whether substandard institutions result in the NRC. Are corrupt politicians the cause of a boom in the extractive industry or is it already decided beforehand? Here, Engerman–Sokoloff's (1997) assertion that natural factor abundance or technology shape the institutional evolution of a society can serve as a starting point (the Staples thesis). This statement was supported by Luong–Weinthal (2006), who mentioned that resource-rich countries deliberately avoid efficient institution-building processes. This is because increasing transparency, rule of law, and political accountability may endanger their control over policymaking and the distribution of export rents. A lack of transparency primarily leads to rent-seeking behavior by politicians in the form of direct payments, subsidies, or inefficient and suboptimal infrastructure expenditures in return for electoral support (Robinson–Torvik 2005). Mehlum et al. (2006) claimed that the NRC occurs due to low-quality institutions, which is similar to Collier–Goderis's (2007) argument that bad governance leads to the NRC. However, if economic policies can mitigate the adverse effects of natural resource revenue, then the NRC is preventable (Acemoglu et al. 2003).

To track the NRC, many studies have focused on the relationship between extractive industries and non-economic indicators, such as the rule of law, government efficiency, democracy, and corruption in the face of private and state institutions. Ross (1999) classified NRC studies into three main categories: those that provide cognitive explanations, focusing on the failures of policymakers; those that provide societal explanations, describing interest groups, elites, or social classes that gain power and in turn create growth-decreasing policies to protect their own interests and power; and those that provide state-centered explanations, covering how state institutions weaken as a result of resource booms.

Bulte et al. (2005) stated that to understand how the NRC works, linkages between institutional structure and resource endowments should be prioritized.

Therefore, institutional explanations of NRC syndrome encompass failures or success stories about how necessary regulations and decisions eliminate the shortfalls of revenue mismanagement (Torvik 2002; Bulte et al. 2005; Baggio–Papryakis 2010; Deacon–Rode 2015). Revenue mismanagement occurs when acquired resource revenue is inefficiently spent as a result of political lobbying to increase the wealth of very limited circles (Gilberthorpe–Papyrakis 2015).

Moreover, if special interest groups capture resource rents and crowd out the majority of citizens, long-term social and infrastructure investments will be delayed (Pendergast et al. 2011). Karabegović (2009) noted that inefficient and unproductive economic activities result from the government's lack of attention to and care for the non-resource sector. In such cases, rent-seeking and corruption will negatively affect living standards (Pendergast et al. 2011) due to the immobility of natural resources. "Immobility" means that, unlike other forms of capital (e.g., machinery, equipment, and labor), natural resources cannot be freely and easily moved from one location to another; this forces authorities to heavily regulate and tax them, thereby creating unproductive economic activities (Karabegović 2009). Furthermore, politicians can intervene in resource allocation processes, influence institutions, and distort policies to benefit from mineral rents (Ross 2001; Stevens–Dietsche 2008; Orogun 2010). Tsui's (2010) model demonstrated that natural resource wealth can a blessing, not a problem that should be overcome to successfully create economic growth. However, without high-quality institutions to manage the effects of mineral wealth, a country is less likely to benefit from its resources.

Furthermore, Hodler (2006) argued that oil windfalls extensively impact property rights, decrease non-resource production, and subsequently lower income. Institutions and human capital are also critical in the development process (Acemoglu et al. 2014). In a cross-country regression, Cabrales–Hauk (2011) indicated that in terms of human capital accumulation and capital formation, institutions play a significant role in determining whether natural resources are actually a blessing or a curse in the long term.

Although the institutional and political dimensions of the NRC have been extensively investigated, no universal consensus exists regarding the relationship of natural resource abundance or dependence with institutional quality. Objective reasons exist to explain this deficiency in the overall position regarding the elements and conceptual parts of the NRC doctrine. For instance, democracy and institutional quality are difficult to measure, and empirical and econometric research usually fails to accurately capture multidimensional connections (Paolo 2008). Notably, a study argued that the NRC is more widespread in presidential and authoritarian regimes than in democratic regimes (Kim–Lee 2018).

In developing countries, democratic institutions are critical for helping to catch up with frontier countries (Butkiewicz–Yanikkaya 2006). NRC literature acknowledges the role of education as an engine of growth; it is also linked to political regimes, elections, taxation, and revolutions. Cabrales and Hauk (2007) argued that natural resources can harm democracy and institutional and human capital accumulation. Their model indicated that if the government’s main source of income is natural resources, politicians are not interested in involving well-educated people in productive activities as it would weaken their position. Well-educated people could gain a higher share of the income, become more deliberate in their political choices, and potentially mount a revolution to replace failing politicians. In addition, according to Wantchekon (2002), the likelihood of an authoritarian regime existing increases if a country is resource-rich. This is because oil rents are thought to increase personalism in political regimes, which in turn nourishes a divergence from democracy (Fails 2019). Therefore, the link between institutions and democracy seems to be very strong.

However, a certain strand of literature opposes the aforementioned approach. After analyzing global data from 1960–2009, Brooks and Kurts (2016) argued that oil reserves and production do not necessarily hinder political regimes from transforming from a democracy into an autocracy, since both oil and democracy are innate to a country’s early industrialization. Nevertheless, developed countries tend to be more democratic than developing countries because they experienced and made progress in industrialization. Usually, these aspects are not accounted for in statistical research. Similarly, Herb (2005) argued that any negative effects of resources on democracy are negligible rather than a universal truth. If a country is oil-rich and non-democratic but there is a tendency toward democracy in neighboring countries, then that country is highly likely to experience similar social and political trends. This phenomenon is known as the interdependency of democracy (Brooks–Kurts 2016).

Dunning (2008) argued for an opposite approach to the associations between democracy and resource wealth. Citing the example of Latin America, he argued that resources have been a blessing for the region due to the redistribution policies implemented by states due to high income inequality. Under high income inequality, authorities tend to apply redistribution policies; if income is not relatively equally distributed among citizens, political rulers are encouraged to use mineral revenue to buy off their political opponents, which occurs in non-democratic regimes.

To obtain an enhanced understanding of the NRC thesis, some scholars have focused on the rule of law rather than democracy. Butkiewicz and Yanikkaya (2006: 660) claimed that "the rule of law, but not democracy, enhances economic growth." Similarly, Norman (2009) and Kolstad (2008) have reported that mineral abundance is negatively associated with the development of the rule of law among resource-rich countries. In a recent study, Adani and Ricciuti (2014) reported negative effects of resource rents on institutions in a large sample of countries. However, they also mentioned the importance of time lags in analyses of the association between the NRC and institutions. Usually, policymakers require time to reshape institutions; sometimes, an indirect effect rather than a direct association exists between institutional quality and resource rents.

In addition, the effects of oil on democracy depend on its regional distribution. Ahmadov (2014) found that oil wealth in Latin America was positively associated with democracy but negatively so in the Middle East and North Africa (MENA) region. A negative link was also found in Sub-Saharan Africa. In countries with weak institutions and high autonomy over social processes on the part of politicians, resource booms allow governments to use resource rents to maintain power. Even if resource booms create efficiency in the extractive industry, the rest of the economy suffers from inefficiencies due to clientelism and resource allocations by politicians who wish to maintain their power (Robinson et al. 2006). Thus, according to Ahmadov (2014), oil does not negatively affect democracy directly, but rather indirectly through particular channels.

Moreover, Konte (2013) found that democracy plays a crucial role in determining whether natural resources are a blessing or a curse for growth, which was not true for education and institutions. Whether the country is democratic or autocratic also does not play a role. However, as measured through democracy and the rule of law, institutions play a significant role in overcoming rent-seeking behavior, which leads to growth collapse in resource-rich countries, especially when point-source resources are abundant (Mavrotas et al. 2011).

In addition, Butkiewicz and Yanikkaya (2010) emphasized the importance of trade openness, which determines growth dynamics. If trade openness is high, resource owners in mineral-rich countries can benefit from higher returns on resource exports and increased non-resource imports. Azerki and Van der Ploeg (2007) found that the NRC was less prevalent in countries where trade openness was high. In addition, in reference to the ideas of Falkinger and Grossmann (2005), Butkiewicz and Yanikkaya (2010) noted that failure to improve non-resource sectors, in turn creating an uneducated labor force, usually represents the misuse of political power by resource owners, who create cheap factors of production for domestic markets. However, Kurtz and Brooks (2011) contradicted this by claiming that trade plays a neutral role in determining the NRC.

The links between growth, democracy, and energy resources ought to be continually investigated until the predictability of such research notably increases (Paolo 2008). From all relevant discussions and debates, institutional, political, and democracy-related variables should be used to help enhance the understanding of the effect of natural resource wealth on countries' economic growth and development.

Yang and Lam (2008) analyzed 17 oil-rich countries and found that oil booms did not lead to lower GDP or decreased investment. The latter was only observed in Venezuela and Columbia, but they are considered institutionally well-endowed. The authors also found that oil booms do not change institutional quality, whereas Daniele (2011) argued that if high resource wealth is accompanied by poor governance, then institutional quality decreases.

In the short term, huge mineral revenue may decrease the domestic tax burden and stimulate the private sector to increase its economic activities. However, once natural resources are depleted, the new equilibrium will entail higher costs than the pre-equilibrium situation (Bornhorst et al. 2009). Besides royalties or tax revenues, central governments derive little benefit from mining activities in the form of value-added because most extracted resources are exported abroad to be manufactured (Davis–Tilton 2005). Empirically speaking, Bornhort et al. (2009) found a negative association between oil and gas revenue and domestic non-hydrocarbon revenues, as measured by non-oil tax efforts. A 1% increase in hydrocarbon revenue lowered non-oil revenue by 0.2%, which could in turn decrease governance quality and public control over the government. Furthermore, if the financial sectors of a national economy are underdeveloped, oil revenue does not contribute to economic growth (Erdogan 2020).

Lastly, in mineral-rich economies, government officials are usually optimistic about windfall revenue. During price slumps, they borrow from abroad and prepare the economy for a second oil boom. Thus, if the subsequent boom fails to generate the necessary revenue in the medium term, the economy finds itself with a foreign debt burden (Auty–Warhurst 1993).

3.1.2.2. Public investments and the capacity to manage oil revenue

Government spending increases as resource extraction rises.[65] This is usually related to attempts by governments of mineral-rich countries to smooth consumption over time due to the uncertain nature of mineral revenue (Stijns 2006). On the one hand, optimal government expenditure can solve many economic problems in a country through fiscal policy; on the other hand, natural capital intensity was argued to lessen growth both directly and indirectly by "reducing equality, secondary-school enrollment rates and investments rates" (Gylfason–Zoega 2003: 289).[66] However, spending should be smoothed within a manageable range rather than relying on or attempting to accurately predict oil prices to manage revenue volatility (Collier 2011). Similarly, Lane and Tornell (1997) emphasized that windfall gains in resource-rich countries lead to competition among interest groups; they exhaust public goods, leading to inefficient public investments. Interest groups' ability to affect government spending to serve their own interests (Meltzer–Richard 1981) may lead to significant delays in structural reforms or other policies for enhancing long-term economic growth (Leite–Weidman 1999). In turn, Baumol (1990) mentioned issues related to rates of return in non-resource sectors, which indicate the magnitude of society's economic incentives to engage with the rest of the national economy (Karabegović 2009). In other words, a decrease in rates of return in non-resource sectors will harm sustainable economic growth due to fewer incentives to invest in non-resource sectors, even if a significant influx of mineral revenue and foreign investments occurs. In such cases, based on institutional and political factors, public investments emerge as a distinct channel for the NRC.[67]

---

[65] It is wrong to think that resource exporter countries do not invest the right proportion of their windfall revenue. However, due to increased opportunities for investments from the windfall revenue, this does not mean that resource richness encourages the accumulation of human capital to the desired level.

[66] For example, the nature of social institutions, which was calculated via variables that measure civil liberties, has an indirect effect on investments, education, and growth (Gylfason–Zoega 2006).

[67] An important note should be added to clarify the role of institutions in terms of direct or indirect impact. Pessoa (2008) drew attention to the social cohesion aspect of measuring institutional quality, which has rarely been addressed. The resource curse should not be solely linked to the quality of institutions that guarantee the work of market mechanisms; institutional quality in the dimension of the social cohesion is crucial to understanding this phenomenon. Manca (2014) defines social cohesion as "the extent of connectedness and solidarity among groups in society." In other words, society and

In resource-rich countries, three pillars of investment management exist to prevent adverse effects of booming sectors. These are capacity building to manage public investments, creation of the necessary environment for boosting private investments, and reduction of the unit cost of public and private investments (Collier 2011).[68] However, in developing countries with inefficient government institutions, public investment reduces growth because it crowds out private investments and discourages savings (Butkiewicz–Yanikkaya 2011). Thus, rates of investment and saving, which ensure long-term sustainability and non-mineral development in small oil-exporter countries, are not at the optimal level (Farzin 1999). Extractive industry-based economies tend to have a weaker production linkage (in terms of the non-mineral manufacturing of tradeables) but a higher government revenue linkage (increased government spending and expenditures during commodity price booms) to the rest of the economy. However, despite higher rates of investments, oil-rich countries tend to have slower economic growth, which strengthens the inefficiency of investments (Auty–Warhurst 1993). Meanwhile, the savings rate should be high if the expected depletion of resources is near. Hence, investment and saving policies should be tailored to the domestic realities of resource-rich, low-income countries[69] (Collier 2011).

Bhattacharyya–Collier (2014) highlighted that public investments are a crucial channel for tracking the effects of the NRC because they are clearer and more direct. In essence, resource rents embody government revenue that is under the control of the government (Bhattacharyya–Collier 2014). If resource revenue does not increase the capital stock, then signs of the NRC may well reveal themselves through the avenues mentioned here. The authors investigated 45 countries from 1970 to 2005 and concluded that the log per capita public capital stock decreased by 7% if a 1% increase in resource rents occurred. In addition, the adverse effects of point-source resources

---

communities also play an essential role in determining whether natural resources serve the overall well-being or not. Therefore, the measurement techniques and methods of institutional quality across the countries cannot allow us to find the ultimate measure for institutional quality that could reflect the true relationship between the resource abundance or dependence and institutional quality.

[68] The essential purpose of these pillars highlights the role of institutions, which should manage mineral revenue in such a way that prevents the signs of the resource curse.

[69] Notably, zero or negative rates of the genuine saving (which includes three types of investment: produced, natural, and human and calculated based on the following formula: GS = investment in produced capital − net foreign borrowing + net official transfers − a depreciation of produced capital − net depreciation of natural capital + current education expenditures) or adjusted new saving is a common picture for resource-rich countries which show the unsustainable consumption of the resource rents, as well as policy, fails to address the future growth issue.

were greater than those of diffuse resources, which favors the NRC doctrine (Bhattacharyya–Collier 2014).

NRC syndrome occurs through government investments when the public fails to monitor increased public spending originating from mineral revenue. Wiens (2014) argued that if institutional preparedness fails to address citizens' interests, then the lack of capable politicians or specialists for adequately managing oil revenue will lead to resource misallocation and inefficient investments. This can manifest as the subnational resource curse, which refers to the regional distribution of fiscal resources being marked by inefficiencies and corruption. Hoyos (2019) demonstrated this in Peru.[70]

Another critical element of the capacity to manage revenue in mineral-rich countries is the role of sovereign wealth funds (SWFs). According to the IMF, SWFs are stabilization funds that usually function as a buffer against commodity price volatilities. These savings funds allocate resource revenue for future generations and help investment corporations to grasp the benefits of better investment opportunities, usually overseas (Allen–Caruana 2008). SWFs enable countries to decouple their national economy from the volatility associated with international commodity markets. Shabsigh and Ilahi (2007) argued that by establishing an oil fund in an oil-exporter country, SWFs can also play a role in industrial development and the pension system. This extends their role by conferring additional status, such as development funds or contingent pension reserve funds.

Oil funds or SWFs in oil-exporter countries have been popular since the 1970s. Yo-Chong (2010) stated that the key characteristic of SWFs is that they are state-owned. In oil-rich countries, state ownership and strict government control raise multiple concerns in the case of non-transparent public governance. This is because SWFs by default play a crucial role in managing a country's absorption capacity after it receives large amounts of revenue. Bahgat (2011) stated that in fast-growing economies such as China and Singapore, oil-rich countries have started to experience current account surpluses following increases in oil prices. This has initiated new attempts to establish oil funds. In turn, this has led to enhanced macroeconomic balance management, as the excess revenue is invested abroad, maintaining inflation levels within the acceptable range. However, the process is not always smooth.

[70] The author investigated Huari and Espinar regions and identified resource curse signs, such as inefficient investments, the dependence of the employment on the mining sector value chains, corruption and fiscal overspending.

Moreover, evidence suggests that SWFs have failed to ensure macroeconomic stability in some oil-rich countries, as they have been unable to decrease the high rates of interdependence between resource earnings and government spending (Davis et al. 2001).[71] In addition, Koh (2017) claimed that the effectiveness of oil funds depends on the country's existing institutional quality; thus, a country with low institutional quality cannot solve macroeconomic stability issues arising from the boom and bust cycles of the economy, even if an SWF is established. This sobering fact demonstrates that even if oil funds are benevolent, their role and association with the rest of the economy must be examined very carefully.

In addition, as oil funds have limited fiscal benefits (Shabsigh–Ilahi 2007), their efficacy is in doubt. The fiscal benefits usually expected from SWFs can be achieved through improved fiscal policies and administration (Shabsigh–Ilahi 2007). Moreover, although SWFs have become highly popular in oil-rich countries, their efficiency depends on the quality of the government and the role of institutions.

In sum, the management of oil revenue in resource-rich countries has failed to achieve high levels of government effectiveness, decreasing the marginal utility of additional revenue (Ossowski et al. 2008). Political and institutional factors play a significant role in determining whether corruption and rent-seeking behavior will decrease the economic benefits of oil revenue in the long run. Thus, public investments, as measured by government expenditure, are a significant transmission channel for the NRC in oil-rich countries.

3.1.2.3. Human capital and education as pathways to the NRC

Human capital is "the skills the labor force possesses and it is regarded as a resource or asset" (Golding 2016). Economic growth cannot be sustained without the necessary dedication to education and human capital development in economic reforms (Ranis et al. 2000). Therefore, human development is an integral part of economic growth in the modern global economy (Bloom et al. 2004; Hartwig 2010). However, the term is relatively new in the jargon of economists (Golding 2016). Still, the relationship between human capital and economic development may not always be so clear cut—it may depend on the country. According to Schultz (1961) and Becker (1964), human

[71] The case of certain countries deserve secial attention (see Davis et al. 2001). For instance, while Norway's experience with SWFs has been successful, Papua New Guinea closed off its Mineral Stabilizations Fund due to failures in smoothing budgetary expenditures. Similarly, Venezuela's Macroeconomic Stabilization Fund failed to smooth its expansionary fiscal policy.

capital characterizes the set of knowledge, experience, expertise, skills, and abilities that an individual gains over time through education, healthcare, and training.

Actually, human capital is as important as corruption as a transmission channel for the NRC in mineral-rich countries (Papyrakis–Gerlagh 2004). This can be traced back to political and institutional factors. Politicians in oil-rich countries do not prioritize human capital development, as their position does not depend on high levels of education or human capital (Wigley 2017). In other words, politicians do not allocate the necessary resources to society because institutional failures ensure their power without the input of the electorate, which displays its will through elections. However, Szirmai and Verspagen (2015) demonstrated that the manufacturing sector can have a positive impact on GDP if a highly educated workforce is employed. Therefore, the education or human capital-related resource curse relies on effects that decrease the time and financial resources invested in the education system (Wadho 2014).

In manufacturing, human capital is one of the most critical production factors. During a resource boom in a given country, institutional failures will lead to decreased human capital accumulation. According to Lucas (1988) and Romer's (1990) popular endogenous growth models, human capital, technology, and research and development are viewed as products of the education system that significantly contribute to the welfare of society. In other words, if human development is neglected, then sustainable economic growth and development will be impossible in the long run. In fact, economic success in advanced and emerging economies is rooted in the education system, human capital development, and investments in information technologies and equipment, which are key drivers of competitiveness in the face of new globalized challenges (Castelló–Doménech 2002; Jorgenson–Khuong 2003; Wilson–Briscoe 2004; Ashton et al. 2005; Kefela 2010). Another reason for human capital's importance to economic growth is that, since 1990, increasing amounts of human capital have been required to achieve higher value-added and succeed among the competition.

Developing the education system and human capital eases technological adoption and provides skilled labor, which are required to manage innovative activities and accelerate economic growth (Awan–Khan 2015). Some even argue that human capital is more important than institutions for economic growth (see Glaeser et al. 2004). Similarly, as a crucial part of human capital development, government health expenditures may boost economic growth. Bloom et al. (2004) concluded that health has a positive and significant effect on economic growth, as measured by the growth of factor inputs, technological innovation, and technological diffusion. More precisely, the authors calculated a 4% increase in output if life expectancy increased by one year. In addition, GDP per capita would increase by 0.5% with a 1% rise in health spending; the same increase in health spending would also boost the survival rate of children aged under 5 years by 0.6% (Beldacci et al. 2008). However, mineral-rich countries were found to underperform with regard to health indicators when child mortality and HIV infection rates were used as proxies (de Soysa–Gizelis 2013).

Countries may ensure effective economic development through rural development, industrialization, the attraction of new firms, and subsequently job creation if high-quality infrastructure is present (Doeksen et al. 1998). The healthcare system and a strong economy are closely interdependent, often in ways that establish sustainable economic development (Ivinson 2002). An increase in health spending guarantees not only an increase in people's quality of life but also direct economic benefits through employment and income (Doeksen et al. 1998). However, in resource-rich countries, spending on education and health is low and human capital accumulation is lower. Moreover, the literature seems to favor human capital as a transmission channel for the NRC among resource-rich countries and regions.

The situation in these countries, however, tells a different story. According to statistical analyses and current literature, skilled human capital grows more slowly in resource-rich economies (Suslova–Volchkova 2012). Studies have frequently observed that education and human capital accumulation do not increase in parallel with resource wealth in such countries (Cabrales–Hauk 2007). Resource abundance and the HDI are negatively correlated; thus, some resource-rich countries fail to provide proportional access to safe water and have an undernourished population (Bulte et al. 2005). Educated workers are the mediators of technological diffusion, which fuels growth. Growth, in turn, is positively and significantly associated with average years of school attainment for men at the secondary and higher levels. Thus, the diminishing utility of education in resource-rich countries endangers non-resource sectors (Barro 2001).

The alarm over commodity-exporter countries arises from a lack of long-term sustainable economic growth and a diversified export basket. In the short term, although natural resource exports increase a country's income level, economic growth will decline without appropriate human capital development (Bravo Ortega–De Gregorio 2005). Gylfason (2001) linked this feature to the fact that resource-rich countries tend to have a capital-intensive rather than a human capital-centered economic structure. In fact, Cockx and Francken (2016) found an adverse relationship between resource dependence and point-source natural resources and public spending on education. This indicates that governments of natural resource-rich countries do not prioritize public education as the share of natural resources of GDP increases over time. Resource-rich countries must invest in education and human capital if they wish to diversify their national economies and sustain long-term economic development and prosperity (Papyrakis–Gerlagh 2004). Barro (2011) also found a nonsignificant association between female school attainment and growth, which suggests the underperformance of female labor utilization in resource-rich countries. Moreover, promoting women's education would indirectly enhance growth by lowering fertility rates.

For the period 1970–2004, Behbudi et al. (2010) demonstrated that human capital is in fact a transmission channel for the NRC if human capital levels are low and petroleum-exporter countries neglect to develop it.[72] In a similar study of 35 resource-rich countries from 1980 to 2015, Shahbaz et al. (2019) found that in countries such as Saudi Arabia, Cameroon, Botswana, and Nigeria, where human capital endowments are low, natural resources were a curse rather a blessing. This was because non-resource productive economic activities were negatively affected by resource dependence.

The wise use of windfall revenue may boost human capital in high-income, resource-rich countries and help prevent a sole specialization in resource production and exports. A key finding of Aldave and García-Peñalosa (2009) was that natural resources create corruption and reduce education, in turn shrinking growth. Thus, resource abundance affects human capital in resource-rich countries.

Moreover, natural resource producer and exporter countries have lower levels of education (as measured by school enrollment level). This is because real exchange rate appreciation decreases the competitiveness of non-resource sectors, thereby lowering the need for human capital to produce manufactured goods (Gylfason et al. 1999). Gylfason et al. (1999) concluded that a low-quality education system raises training costs, which disincentivizes secondary sectors[73] from enhancing worker skills and building innovation-based production processes. Therefore, secondary sectors may suffer from the high cost of hiring, learning, and growing because lucrative primary

[72] Human capital may not only compensate for negative effects arising from the economic dominance of the extractive industry as the Scandinavian example shows. If human capital is abundant, the joint development of high-technology and extractive industrial sectors can occur in parallel if there are strong linkage between resource and non-resource manufacturing (Bravo–Ortega–De Gregorio 2005).

[73] By "secondary sectors" Gylfason et al. (1999) mean non-resource tradeable sectors.

sectors pay higher wages. Secondary sectors may also increase payments to prevent employees from leaving.

Measuring the quantity and quality of education poses a serious challenge due to the variety of ways to conduct surveys and use analytical methods in the literature. For example, Hanushek and Wößmann (2007) measured the quality of education in terms of international test scores and level of education by years of schooling as the main determinants of economic growth.

However, some express contradictions and a degree of skepticism toward the role of education in economic growth. Compared with studies by Mankiw et al. (1992), Mankiw (1997), Benhabib and Spiegel (1994), and Barro and Sala-i-Martin (1995), the cross-country regressions of Caselli et al. (1996) and Pritchett (1996) have demonstrated weak or even negative associations between economic growth and education.

The literature also contains many conflicting results concerning the link between human capital and resource wealth. Pineda and Rodríguez (2010) claimed that the interaction between human development and natural resource abundance is positive and significant. In particular, natural resources significantly affected non-income components of the HDI, such as literacy and life expectancy, from 1970 to 2005. The impact of resources on human development has also been uneven. For instance, the authors found that Latin America has benefited from natural resources less than the average of other resource-rich regions. Moreover, Wigley (2017) found a negative association between oil and gas abundance and child mortality in 167 countries between 1961 and 2011.

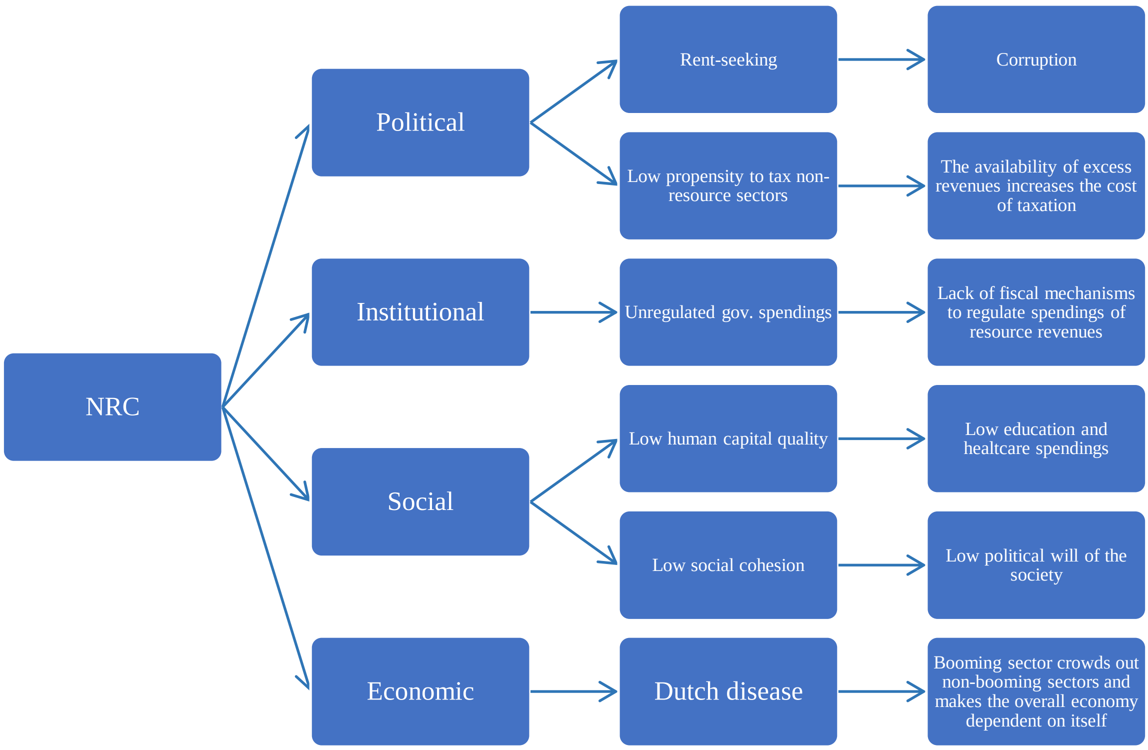
In addition, Shao and Yang (2014) advocated for the efficient allocation of production factors. They claimed that resource abundance and the development of resource-based industries can be a blessing if mineral revenue is properly and efficiently invested into improving education and increasing educational opportunities and quality.[74] Thus, whether natural resource wealth has the effect of a curse or blessing is conditional. If investments in human capital development continue, oil-rich countries

[74] In spite of this, there are opposing ideas. Greasley–Madsen (2010) argued that a country's geological and geographic properties matter more than its institutional and educational standards. Wright and Czelusta (2004) cited the United States, Sweden, and Norway as examples of countries where natural resources were used to initiate the industrialization process and where education and institutional properties were developed only after this process was started. Greasley–Madsen (2010) said that knowledge creation that results from mineral extraction positively affects growth, while land abundance has the opposite effect.

can benefit from resource wealth, eventually reducing the negative effects of oil (Kurtz–Brooks 2011). Nevertheless, it is vital to combat the detrimental effects of extractive industry development, such as real exchange rate appreciation, de-industrialization, and macroeconomic volatility. These are usually considered the curse of natural resources (Shao–Yang 2014) and directly and indirectly affect education and human capital.

Figure 3. 1 summarizes the overall NRC phenomenon in a graphical way.

Figure 3.1: The main transmission channels and results of NRC.



Source: The author's own construction based on the literature review.

3.1.3. The NRC in Azerbaijan

This section examines the relevance of the NRC doctrine in the case of Azerbaijan. Since the mid-1990s, Azerbaijan has been repeatedly mentioned when economists have expressed concerns about upcoming signs of the NRC and DD. This is due to the country's agreements signed with multinational companies in the extractive industries and expectations of huge mineral revenue; specifically, concerned economists have argued that the domestic absorption capacity is lacking for such an influx of capital and revenue (Tsalik 2003). Biresselioglu et al. (2019) classified Azerbaijan as a country highly vulnerable to the NRC, ranking it among the top 10 countries labeled "high," as measured by the Resource Curse Vulnerability Index (RCVI).[75] This indicated a lack of economic diversification, economic planning, and industrial development policies. Consequently, the literature reviewed in this section demonstrates that, starting from the mid-to-late 1990s, a growing body of studies sounded the alarm about the presence of the NRC in Azerbaijan's economy.

Following an analysis of large oil and gas projects, Hoffman (1999) argued that the chances of converting oil revenue into widespread economic growth were low if an appropriate tax-collecting apparatus and independent statistics remained absent in Azerbaijan. Some have argued for the possibility of the NRC or DD while relying on the experiences of other resource-rich countries. The rationale is that, since the NRC has occurred in other resource-rich countries, it could also happen in Azerbaijan. For example, Esanov et al. (2001) argued that domestic energy sectors and fiscal management are two key challenges for Azerbaijan due to a lack of necessary experience in managing oil revenue; similar challenges were observed in other case studies.[76]

In early articles on the NRC in Azerbaijan, the government's decisions and new spending habits were sources of great concern. Some authors claimed that oil revenue was spent in a nontransparent manner that did not support non-oil development, which could ensure long-term sustainable development; in addition, the distribution of benefits was problematic at the national level (Gulbrandsen–Moe 2007). Khanna's (2011) descriptions of Azerbaijan's oil boom period highlighted the government's low willingness to redistribute oil revenue, market-distorting interventions by the state, and the influential position of oligarchs. Achieving independence from the Soviet Union did not appear to inspire Azerbaijan to manage its oil revenue in a desirable way. Consequently, if the management of oil revenue fails, the reasons behind the fiasco point to the relevance of the NRC.

As an economic explanation for the NRC, concerns about DD have been frequently voiced.[77] Singh and Laurila (1999) asserted that DD syndrome was present (due to exchange rate overshooting) in Azerbaijan from the early 2000s. In addition, a low level of democracy and weak rule of law seriously diminished the government's

---

[75] For more details, see Biresselioglu et al. (2019).

[76] Similarly, Bandiera et al. (2008) documented that if Azerbaijan overspends, then it could be a net debtor if the oil prices fall (see also Budina–Wijnbergen 2008). Also, the study from Esanov et al. (2001) incorporated the case studies of Kazakhstan, Turkmenistan, and Uzbekistan.

[77] The results of a literature review on DD in Azerbaijan are elaborated on in Chapter 4 of this dissertation.

capacity to design policies that could successfully manage revenue (Tsalik 2003). Wynne Russel et al. (2004) reported DD and signs of the NRC as economic risk factors for sustainable economic development and the catching-up process after the collapse of Soviet rule in Azerbaijan.

Amineh (2006) claimed that resource-rich post-Soviet countries, such as Azerbaijan, Turkmenistan, and Kazakhstan, would not be able to successfully industrialize due to issues arising from the NRC. Similarly, Esanov et al. (2005) argued that political reforms in resource-rich transition countries do not favor a deterministic model of policy formation.

In fact, according to Kronenberg (2004), substantial differences exist between resource-rich and resource-poor transitional countries. He argued that, while resource-poor Central and Eastern European (CEE) countries performed well in catching up with developed economies, resource-rich countries seemed to lag. This was mainly due to corruption inherited from the Soviet era, which entailed a high level of state capture. Franke et al. (2009) argued in favor of the existence of the NRC in Azerbaijan because of the lack of an alternative political elite as well as a substandard democracy; moreover, they argued that a lopsided economic structure was established after high mineral revenue flowed into the country. Early concerns about the NRC in Azerbaijan were based on a lack of budgetary processes, long-term policy planning, public sector constraints in front of private sector development, and dependence on oil prices (Tsalik 2003). If oil prices crashed, poverty and unemployment would increase (Franke et al. 2009).

Observations and analyses of political and institutional variables in Azerbaijan have supported the relevance of NRC syndrome. Bhatty (2002) considered corruption, weak state capacity, and impediments to trade the main signals of the political and institutional channel for the NRC. Bayulgen (2005) argued that oil rents encouraged an authoritarian regime, resulting in the accumulation of power in the hands of the president. Later, O'Lear (2007) provided evidence of the NRC based on survey data from Azerbaijani citizens. According to his findings, an oil-dominated economy, a high concentration of wealth in the hands of a ruling elite, political legitimacy problems, and centralized political control were clear signs of the NRC. Other indications of the NRC's political and institutional channel include internal and external patronage networks, clientelism (Bayulgen 2005; Guliyev 2009), autocracy (Schubert 2006; Pomfret 2011; Kendall–Taylor 2012; Radnitz 2012), problems with political freedom and democracy (Altstadt 2017), transparency and accountability issues in revenue spending (Wakeman-Linn et al. 2003; Franke et al. 2009), and strong resistance to the development of the private sector (Kalyuzhnova–Kaser 2005). A further indication is neopatrimonialism, which refers to informal personalized rule combined with pyramidal power structures (Franke–Gawrich 2010; Heinrich 2010).

In Azerbaijan's economy, institutional failures have hindered effective macroeconomic management, especially poor revenue management, which originates from SOFAZ (Mirzeyev 2007). Oil revenue created confidence among political circles, leading to inefficiency and poor performance in the taxation of the population (Shaw 2013). In turn, low taxation led to a shallow aspiration for democracy (Almaz 2015). Then, there are no less benign conditions for signs of the NRC to develop in a rentier state, leading to a lack of willingness to diversify the economy. Guliyev (2013) argued that the government and political elites are uninterested in the diversification of Azerbaijan's economy because regime opponents could accumulate power and become autonomous power centers. The voices of civil society and nongovernment organizations (NGOs) being limited was another source of concern regarding the country's deteriorating political and institutional development in 2014 (Sovacool–Andrews 2014). This creates a chain reaction in Azerbaijan's economy, where the effects of the NRC are embodied in the form of weak monitoring of the oil sector and revenue by civil society; notably, the latter could ensure transparency and accountability (Aslanli 2018).

Because of the country's political and institutional failures and oil-dominated economic structure, certain studies have focused on rent-seeking and bribery in Azerbaijan. According to Sadigov's (2014) survey and analysis, bribery in Azerbaijan is strongly correlated with individual respect for the rule of law and the overall jurisprudential system. Higher levels of corruption undermine the power of said system, which leads to unsatisfactory cases in the legal system.

The other possible channel of the NRC in Azerbaijan's economy is FDI. The flow of FDI mainly into extractive industries harms non-resource economic growth because these industries are highly capital-intensive; furthermore, multinational companies (MNCs) cannot generate poverty-reducing employment and wage-boosting economic activities at the national level (Asiedu 2013). Vanderhill et al. (2019) argued that Western FDI in Azerbaijan has not led to positive changes in the institutional environment, which could boost FDI into non-resource sectors. However, Mammadova and Coskun (2015) argued that FDI and technology transfers have had a significant and positive impact on non-oil sectors. According to them, any issues associated with lagging non-oil sectors should be addressed within the fact that Azerbaijan is a developing country and such countries usually face difficulties in catching up with advanced economies. However, in line with early concerns about the NRC in Azerbaijan, Lee (2005) mentioned that FDI only favors the ruling elites, leaving many economically disadvantaged citizens behind.

Along with institutional and revenue management failures, the education system in Azerbaijan has shown signs that point to the existence of the NRC. However, studies that directly assess the impact of natural resources on education and human capital are difficult to find. Based on input–output analyses of 2006, 2008, and 2009, Sadik-Zada et al. (2020) argued that although human capital in Azerbaijan is abundant, the extractive industry's low job creation and production linkages are obstacles to reinvesting mineral revenue for policymakers. This argument supports the belief that manufacturing sectors in Azerbaijan are shrinking, which demonstrates the crowding-out effect of the extractive industry.

Moreover, a shrinking non-oil manufacturing sector reduces the demand for skilled workers and specialists. Thus, the education system in any given country operates within a complex ecosystem of political and institutional subsystems, which are integral parts of a more complex social structure (Ursul–Ursul 2013). One disaster leads to another, creating a vicious circle. For instance, Sadigov (2014) argued that the education system in Azerbaijan fails to teach marketable skills to students; furthermore, a large market exists for acquiring diplomas by dishonest means, as having one is a precondition for obtaining a job or increasing one's social status. This has led to a dual perception of bribery and the education system among citizens. Recently, Shahbazov and Afandiyev (2020) found that Azerbaijani students consider white-collar[78] crimes to be more serious than usual crimes. Although education expenditure (along with gross capital formation and population growth) in Azerbaijan increased with economic growth from 1995 to 2018 (Mukhtarov et al. 2020), whether non-oil tradeable sectors have benefited is unclear.

[78] Based on Sutherland's (1983) definition, white-collar crime means "a crime committed by a person of respectability and high social status in the course of his occupation"

Another integral part of human capital is the healthcare system. Although the government's perceived capability substantially increased just before the oil revenue boom, the quality of medical service delivery remained below par (Ibrahimov et al. 2010; Aliyev et al. 2011). Some have argued that this is due to unofficial out-of-pocket payments and corruption (Habibov et al. 2018); others have mentioned factors such as decision-making, the auditing of budgets, and standardization issues (Ünal–Tagiyev 2016); while others mentioned the inefficient use of healthcare resources (Bonilla-Chacin et al. 2018). The occasional failure of healthcare legislation and a lack of incentives to build an efficient healthcare system—despite the availability of enormous oil revenues—could be viewed as a sign of the NRC (Ibrahim et al. 2010). If the population cannot afford the high cost of medical services because of unofficial payments requested by doctors, then what is so good about being an oil-rich country is unclear (Aliyev et al. 2011). Because of the close nexus between political and institutional incompetence and the healthcare system, Rzayeva (2013) argued that the state has failed to restructure and deliver high-quality medical services to the majority of the population. The state's healthcare expenditure has also remained low (Aliyev et al. 2011). A common perception among Azerbaijani citizens is that the public healthcare system has not changed much since Soviet times and that public policy has failed to eradicate the marginalization of a large part of society (Hohmann 2014). Thus, without the systemic transformation of the healthcare system, human capital cannot be fully developed in Azerbaijan. Although this could be gradually accomplished with the help of oil revenue, some authors are highly skeptical about any radical transformation that could result in a sustainable, efficient, and socially inclusive healthcare system.

Notwithstanding, some authors evaluated the early 2000s in Azerbaijan as economically successful; however, there is still a long way to go. Mehmet (2006) considered Azerbaijan being authoritarian or democratic as equally likely, mentioning successful decisions to manage oil wealth (e.g., the establishment of SOFAZ). An example of a successful attempt to manage oil revenue is the integration of civil society participation in the management process (Bayramov 2009). Clemens (2007) offered several optimistic predictions about the future of Azerbaijan's economy, such as effective anti-corruption drives, the high potential of non-oil sectors, and an upward trend in the development of financial markets. Îlhan (2007) also addressed institutional challenges in Azerbaijan, stressing the need to strengthen domestic and global civil actors to successfully combat the NRC, as Norway did. Other articles have emphasized the successful avoidance of debt accumulation and oil-fueled spending (e.g., Malik 2010). However, the aforementioned articles are not so recent and do not account for the rapidly changing domestic realities of oil revenue management, the development of non-oil sectors, and political transformations.

In addition, Aridemir (2018) outlined some serious steps taken by Azerbaijan with regard to non-oil sectors, especially in cooperation with Turkey to attract FDI. If FDI can be increased in non-oil sectors, then even if domestic institutions fail to redirect oil revenue into them, an opportunity to develop non-oil sectors exists.[79] Weeks (2008) argued that capital controls and the fixed exchange rate of the AZN against USD has helped Azerbaijan to minimize the effects of the NRC. However, tangible progress in non-oil development through FDI is relatively rare.

Hübner (2011) listed several obstacles to non-oil FDI that can impede serious developments. These include sector monopolies, informal barriers to market entry, bribery, and unfavorable monetary conditions. Together, they represent the regime's failure to develop non-oil sectors while FDI flowed exclusively into the energy sector, creating the illusion of good governance (Frayne 2012). However, Hübner (2011) also cited positive developments that have empowered non-oil sectors, such as the rapid development of the banking sector, the proliferation of businesses through the one-stop shop,[80] and the establishment of a state investment company to attract FDI. Overall, FDI provides incomplete insights for understanding the NRC in Azerbaijan.

Another approach to tackling the NRC lies in the view that even if its effects are deeply rooted in the economy, they have not transformed Azerbaijan into an authoritarian regime, since transparency and accountability issues were already prominent in the pre-oil boom period (Walker–House 2008). However, based on British Petroleum (BP) documentation, Flegel (2012) argued that Azerbaijan is part of a tiny group of countries where the main oil and gas projects are publicly available. Moreover, the EITI has supported Azerbaijan's institution-building efforts to manage oil revenue (Öge 2014). However, the country stopped participating in this process in 2017 (EITI 2020).[81] Economists have voiced their concerns about this development as it decreased

---

79 However, this is a vicious cycle. Still, due to the economic channels of the resource curse, non-oil sectors may not seem attractive, and this will hinder the growth of non-oil sectors.

80 By one-stop shop, Hübner (2011) meant "the Azerbaijan Service and Assessment Network, known as ASAN, which means "easy" in Azerbaijani, is a multi-purpose service network that provides easy access to public services and streamlines government-to-citizen communication" (Mehdiyev 2020).

81 Which joined in 2007.

the country's economic attractiveness for developing non-oil tradeable sectors (Alili–Bittner 2017).

Despite the apparent signs of the NRC, economists have expressed a high degree of optimism about the possibility of sustainable economic development in Azerbaijan; said optimism is conditional on oil revenue being effectively managed, trade reforms being implemented, and corruption and rent-seeking behavior being brought under control (Ismayil 2015). A particular policy preference should be given to the strategic use of accumulated revenue to achieve productivity growth that can ensure an increase in competitiveness, which is achievable for the government (Musayev 2016). Nevertheless, a critical approach to successful oil revenue management should not be ignored, as recently Gurbanov et al. (2017) demonstrated that the government's expenditure on capital has not translated into industrial growth; in theory, this should be realizable because the 2015–2020 State Program on Industrial Development was adopted as an economic reform tool for realizing growth in non-oil tradeable manufacturing.[82]

In the case of Azerbaijan, some insights obtained through the literature review largely follow theoretical expectations, but others require further investigation. The inclusion of new variables that measure relevant aspects of the NRC and multiple methodologies would allow for an improved conceptualization of the NRC as well as significantly extend knowledge on the topic. Despite statements by various authors about the government's successful fight against NRC syndrome, they do not have enough explanatory power to allow conclusions to be drawn either way regarding its existence in Azerbaijan. However, the limitations of the NRC should also be noted, which are detailed in the final subsection of the literature review as follows.

3.1.4. Criticism and limitations of NRC theory

Despite the popularity of NRC theory in academic research since the early 1990s, it has also been heavily criticized. Simply assuming an unconditional negative association between resource exports, abundance, and production may lead to misleading results. Mineral economies are not necessarily doomed to experience slower growth because resource revenue provides foreign exchange, which is a source of government spending and resource-based industrialization (Auty–Warhurst 1993). Instead, the so-called NRC has direct and indirect effects, and many things may help to alleviate them. According

[82] See also Hamidova (2018) for the policy recommendations for diversifying the Azerbaijan economy.

to Mapon and Tsasa (2019), the problem of the NRC does not exist; instead, they asserted that it is the failure of government leadership to develop prodevelopmental institutions to suppress the rent-seeking behavior of interest groups that channels mineral revenue toward private benefit. Moreover, several scholars have found that natural resources can have a positive impact on the labor force (Lederman–Maloney 2003), real GDP, and institutional quality (Brunnschweiler 2008). Thus, what the NRC doctrine asserts is questionable.

Certain relationships between economic indicators seem to meet the critical approach to NRC syndrome. In terms of direct and indirect association, natural resource abundance and income per capita do not exhibit a direct negative association (Canuto and Cavallari, 2012). A finding of Ding and Field (2005) was that resource assets are positively associated with growth, but that resource dependency is negatively associated with growth, as predicted by Sachs and Warner (2001).

Lederman and Maloney (2003) based their statement “there is no resource curse” on an analysis of the connection between growth, natural resource exports, and intra-industry trade. The authors found a positive impact of the share of primary exports in total GDP and the labor force on growth and criticized Sachs and Warner’s (1993) NRC syndrome.

NRC theory was also challenged by the cross-country survey of Brunnschweiler (2008), which employed OLS and 2SLS estimation methods. In the study, an examination of natural capital, as measured in USD per capita and selected institutional indicators (i.e., the rule of law), revealed that mineral resources did not have a negative impact on real GDP growth and institutional quality from 1970 to 2000.

Moreover, Brunnschweiler and Bulte (2008) found a negative correlation between resource dependence and income per capita from 1970 to 2000, indicating the validity of the NRC. However, a positive correlation appeared after the explanatory variable was changed from resource dependency to resource abundance. The authors emphasized the endogeneity problem of resource dependence (as an explanatory variable) in the correlation analysis on growth and conflict. They also found just the opposite: a causal relationship among conflicts and weak institutions and the NRC, which would mean that the NRC is a result rather than a cause of underdevelopment.

As mentioned earlier, natural resources are not necessarily an evil and sometimes even lead to improvements in a country’s economic indicators. For instance, evidence from 31 OECD countries (including resource-rich ones) suggested that globalization and natural resources improve financial development (Zaidi et al., 2019). If institutional quality in a resource-rich country is high, the gross savings rate should also be high; however, if corruption hinders institutional quality, genuine savings should substantially decrease (Dietz et al. 2007).

Despite these critical approaches to NRC syndrome, the doctrine was assumed to be valid in the present study to analyze the impact of oil revenue and associated economic activities on economic growth and development. This assumption was also made to ascertain whether observed non-oil economic deterioration can be attributed to the oil sector in Azerbaijan.

3.2. Dutch disease

The history of the DD phenomenon goes back to the economy of the Netherlands, where manufacturing sharply declined after the discovery and exports of North Sea natural gas (Humphreys et al. 2007). This economic phenomenon, which went against the expectation of improved economic and social outcomes in the long run, drew the attention of both academia and popular media. *The Economist* (1977) coined the term "Dutch disease" and, since then, DD has become a popular model for conceptualizing sectoral changes in resource-rich economies.

The Dutch case had several notable characteristics, which served to ground the DD hypothesis. Examples include an overvalued national currency, increased government spending, and decreased non-resource exports. However, why should a country experience adverse effects due to a booming sector? Eerd (2010) argued that declining manufacturing in the Netherlands resulted from the negative macroeconomic effects of large-scale projects and increased government spending occasioned by natural gas revenue. These factors created unsustainable financial mechanisms for financing these large investments in the long run. In particular, previously competitive domestic tradeable sectors lost competitiveness due to higher local prices and real exchange appreciation (Barder 2006). Imports became cheaper, removing an economic incentive for local producers to create value-added. Moreover, Eerd (2012) stressed the role of Dutch politicians, who failed to resist the temptation to spend the revenue that flowed into the country within a short period, which also required little accountability to inject cash into the national economy. Then, increased energy prices multiplied the utility of the Slochteren natural gas field for the Netherlands economy, which in turn impacted growth, inflation, the labor market, the external balance, fiscal accounts, the industrial structure, and social policy (Ciuriak 2014).

Based on the Dutch case, Eerd (2012) asserted that DD could happen in both developing and developed countries. However, Friedman (2006) insisted that only oil-rich countries tend to experience the effects of DD, as they are vulnerable to the impact of oil booms through the oil price channel. In addition, resource abundance and oil prices jointly identify the economic behavior of the state through politicians and political regimes. Unlike Friedman (2006) and Eerd (2010), Wacziarg (2012) failed to find any statistically significant correlation between oil prices and political regimes.

Although mineral resources (especially in oil- and gas-rich countries) serve as well-known case studies for DD, the Australian gold booms of the 19th century, the Colombian coffee boom of the 1970s, and gold and silver extraction by Spanish and Portuguese colonial powers are also considered events that gave rise to DD (Humphreys et al. 2007). In other words, all of the abovementioned economic events changed the economic structure as well as fiscal and monetary policy of countries challenged by sustainable long-term economic development. This brings us to a major point—whether DD could provide an economic explanation for the NRC doctrine.

Today, DD is the most common approach for representing the macroeconomic challenges of resource-rich countries (Henstridge–Roe 2020). It is usually defined as a chronic exchange rate appreciation resulting from foreign currency inflow and inefficient management, which increases price levels in the economy (Van Wijnbergen 1986; Bresser–Pereira 2013; Barder 2006). Sachs and Larrain (1993) argued that the mismanagement of windfall gains harms the productivity and competitiveness of non-mineral tradeable sectors and abruptly decreases the country’s supply of these goods and services. Therefore, the most distinct symptoms of DD are an appreciated exchange rate, domestic inflation, and reduced international competitiveness of domestic exporters as a result of an overvalued national currency (Stiglitz 2005). The main reason for these symptoms are an increase in the price of the main export mineral or agricultural commodities, which in turn triggers a resource misallocation process through relative prices in economic sectors (Badeeb et al. 2016; Murshed 2004). Then, a deindustrialization process occurs (Corden–Neary 1982). De-industrialization refers to a shrinking non-resource manufacturing and industrial capacity (Koritz 1991; Gregory et al. 2009), whereas de-agriculturalization refers to a declining role of agrarian sectors in the economy[83] (Johnston 1970; Gollin 2010).

The first model for the DD hypothesis was presented by Corden and Neary (1982). The model assumes a three-sector economy: a resource tradeable sector (booming) or S_B; a non-resource tradeable sector (lagging) or S_L, which mainly consists of agriculture and manufacturing; and a non-tradeable sector (tertiary sectors, usually services) or S_{NT}. According to Corden (1984),[84] world markets determine prices in both resource tradeable and non-resource tradeable sectors, while domestic markets dictate prices in non-tradeable sectors. Another critical concept in DD theory is the real exchange rate, which is represented as the ratio of non-tradeable sector prices to tradeable sector prices. Other assumptions in the theory are as follows: two production factors exist in the economy (labor and capital); different sectors have various levels of labor-to-capital ratios; capital is fixed but labor is mobile in the short run; the labor market is flexible and full employment exists in the economy; and internal demand in the national economy is determined by household consumption (as summarized by Mironov–Petronevich 2015).

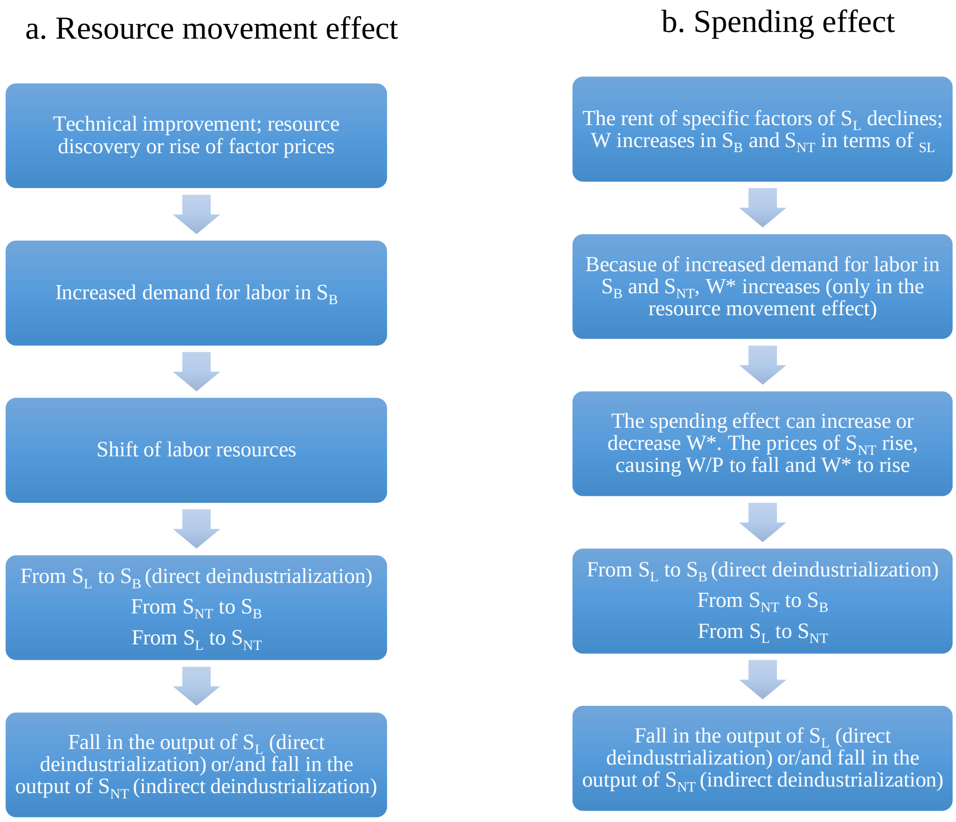
DD occurs through two effects (either alone or jointly): the spending effect and the resource movement effect. According to Corden (1984), sources of the spending effect can direct spending by resource owners (directly through profit-making companies if the government does not own a high share of booming sectors) or government expenditures (indirectly through collected taxes and subsequent state spending). In both cases, there is a higher demand for non-tradeable goods, as this demand drives and leads to an increase in the price levels of non-tradeable sectors in terms of manufacturing goods, which Corden referred to as "real appreciation" (Nülle–Davis 2018). Government spending triggers consumption sourced by imports at the expense of domestic manufacturers, as explained by the DD hypothesis, which discourages necessary non-resource production activities (Humphreys et al. 2007). In addition, the spending effect may be triggered if an expectation exists of high capital

[83] However, one important distinction should be mentioned here. Usually, de-industrialization and de-agriculturalization in developed countries are understood as the economy's natural structural change process against the background of increasing per capita income and productivity. Thus, Corden and Neary's (1982) Dutch disease-related de-industrialization and de-agriculturalization should be understood differently. In other words, de-industrialization or de-agriculturalization are attributable to booming sectors that give rise to the effects of DD (Palma 2008; Üngör 2013).
[84] A non-mathematical summary of the DD model.

inflows into the country due to new agreements for extractive exploration and extraction (Rodriguez–Sachs 1999).

The second effect is the resource movement effect. As the name suggests, because of an increase in marginal labor productivity, labor resources move from lagging sectors toward booming sectors to meet increased need there. Resources moving away from lagging sectors will lead to direct de-industrialization; thus, the market for non-tradeable sectors is not involved and the real exchange rate will not appreciate. However, if labor resources move from non-booming sectors to non-tradeable sectors because of the spending effect (in addition to the resource movement effect), then they will also move from non-tradeable sectors into lagging sectors (a combination of the resource movement and spending effects). Figure 3. 2 (panel *a* and *b*) depicts these effects in more detail:

Figure 3.2: Effects of Dutch disease according to the original theory by Corden and Neary (1982) and Corden (1984).



Source: The author's own construction based on Corden (1984).
Notes: S_B = booming sectors; S_L = lagging sectors; and S_{NT} = non-tradeable sectors. W and P denote wages and prices, respectively.

The literature has provided theoretical frameworks that assist in conceptualizing the effects of DD on an economy; however, measuring these effects entails several challenges due to the difficulty of determining the counterfactual size of tradeable sectors in the economy (Brahmbhatt et al. 2010).[85] Sachs and Warner (1999) argued that the growth-generation process in resource-rich countries depends on increasing returns to scale in economic sectors. If increasing returns to scale occur in non-tradeable sectors, mineral revenue generated from resource booms can be channeled to non-tradeable sectors and increase economic growth. However, if they occur in the tradeable manufacturing sector, resource booms would hinder economic growth due to the effects of DD. In other words, the precise identification of productivity and return to capital indicators is fundamental in DD studies.

Furthermore, resource-based industries are not labor-intensive, resulting in them making a weak contribution to a country's employment rate (Roemer 1979).[86] Oil booms lead to higher wages in booming sectors, overly rapid consumption, and higher government spending, which increase domestic price levels and hence decrease the competitiveness of agriculture and manufacturing. As indicated by the original case of the Netherlands, a declining ratio of non-petroleum products to GDP translates to a loss of competitiveness (Gylfason 1984). Thus, resource booms cannot permanently raise GDP and per capita GDP if the country's exports heavily depend on primary goods. In addition to real exchange rate appreciation, this also leads to high-level protectionism in manufacturing (Auty–Warhurst 1993), which is usually accompanied by rent-seeking behavior by firms.

Overcoming DD is a prerequisite for sustainable long-term growth (Auty–Warhurts 1993). If a country is mineral-rich, it may experience receding economic development due to increasing technological gaps and divergence in productivity vis-à-vis trading partners who are not mineral-rich (Cherif 2013). Therefore, any displacement process of the manufacturing industry in a developing country should be minimized. Otherwise, the strong positive externalities resulting from diversification and adaptation to the current economic environment cannot be provided by the

[85] According to Chenery and Syrquin (1975) and Brahmbhatt et al. (2010), the counterfactual refers to measuring what would have been the size of tradeable sectors in the absence of natural resources.

[86] Of course, exceptions do exist. In the south-central United States, there have been no signs of the resource curse despite the prominent role of the natural gas sector. According to Weber (2014), this is because every gas-related job created at least one non-mining job, and the resources did not have a crowding-out effect on non-resource sectors. However, Weber (2014) also highlighted the volatility of resource revenue, which creates risks for local and state government revenue and spending. And, environmental and health effects deserve a mention here.

economic structure. However, the growth-enhancing potential of lagging economic activities should also be studied; otherwise, support for non-competitive and economically unviable sectors may fuel rent-seeking behavior (Ciuriak 2014).

In addition, Auty (2007) mentioned three institutions that can limit DD: a capital fund that smoothes the revenue or spending stream and ensures a competitive exchange rate; cooperation with the Extractive Industries Transparency Initiative (EITI) to decrease rent-seeking possibilities and establish organizational units to evaluate public investments; and the establishment of a public investment evaluation unit to regulate mineral rent deployment and increase the government's propensity to invest in productive economic activities. Stiglitz (2005) also mentioned stabilization funds as an institutional tool and integral part of macroeconomic policies for countering the NRC. Stabilization funds can play a significant role by diminishing the rent-seeking activities of governments of resource-rich countries, establishing transparent spending frameworks, and decreasing the natural propensity of central governments to spend mineral revenue. However, depending on the political regime, sovereign wealth funds may fail in their mission if resource wealth becomes easily manipulated.

Nevertheless, DD may not pose a serious risk to economies compared with other transmission channels for the NRC. Sala-i-Martin and Subramanian (2013) argued that waste and corruption from oil resources, rather than the DD hypothesis, are the true sources of long-term economic underperformance.[87] Moreover, theoreticians and scholars have asserted that DD is not a "disease" but rather an adjustment process of the economy toward comparative advantage (Sachs–Warner 1955); furthermore, it can be viewed as a form of structural disequilibrium rooted in booming sectors and macroeconomic failures (Davis 1995; Kojo 2014).

Thus, even the conceptualization of developing and developed countries within DD syndrome is a scientific puzzle. Still, DD presents a valuable opportunity worth examining in resource-rich countries as well as a useful analytical framework for explaining their economies (Ebrahim-Zadeh 2003). A careful examination of a national economy according to booming, lagging, and non-tradeable sectors is a prerequisite for diagnosing the DD phenomenon or simply tracking its signs. Notably, for mineral-rich

[87] The authors gave an example taken from Nigeria arguing that all Nigerian citizens should have a right to benefit from oil revenue directly. They address the popular policy solutions for the economic mismanagement sourced by huge mineral revenue such as prudent macroeconomic policies and fiscal policy. Privatization and trade liberalization are irrelevant. This should allow for the Nigerian government to address the key issue related to the oil abundance, namely oil revenue management. Still, it is hard to argue that DD is directly related to the rule of law (Mehlum et al. 2006).

countries, DD as a theoretical explanation for economic underperformance or a transmission channel for the NRC is not a strict rule; rather, it should be treated as an expectation (Davis 1995).

3.2.1. Dutch disease in Azerbaijan

In this section, a brief literature review of the DD phenomenon is provided only in the case of Azerbaijan's economy. In Azerbaijan, the main theory used by economists to model the economy has been the DD theory since the beginning of the recovery period (1995–2004). While some researchers have merely expressed concern about the expected effects of DD, which typically occur in oil-rich countries, others have provided empirical evidence of their existence. In other words, some economists have not been able to point to any meaningful patterns of DD in Azerbaijan, while others have vehemently defended them. However, since the commodity supercycle ended (2014–2015), the popularity of studies using DD has increased, with Azerbaijan serving as an example due to the devastating external shocks observed in 2015. Therefore, the obvious signs of DD in Azerbaijan's economy paint a complicated picture for scholars. Further studies are required to clarify the underlying mechanisms responsible for the DD syndrome in Azerbaijan's economy. Such a clarification would assist in understanding the process of the de-industrialization of certain non-oil manufacturing sectors.

This literature review section is divided into three subsections, namely early studies (4.1.1), direct studies (4.1.2), and indirect studies on DD (4.1.3). This classification allows for the critical evaluation of the results obtained through empirical methods as well as an investigation of the possible presence of DD in Azerbaijan's economy.

3.2.1.1. Early studies

In Azerbaijan, economic growth has been driven by extractive industries since 1994, when the Contract of the Century was signed.[88] Since then, the non-oil manufacturing sectors have been neglected by the incumbent government. Within 4 years of the Contract of the Century, the government's exclusive focus on the oil sector was criticized by scholars and economists. They stated that this one-sided policy could lead to the NRC and DD in the long run if policy makers do not make the necessary changes.

[88] See Chapter 2 for more details.

Early studies on the relevance of DD to Azerbaijan's economy mostly lacked precise research based on country-specific data and careful reasoning. They addressed concerns about the resource-based development of the economy compared with that of other mineral-rich countries. By contrast, later studies adopted a more focused approach (e.g., Hasanov 2013, Majidli 2022). Several authors have believed that DD could manifest due to the Azerbaijani government's lax attitude toward reforms in the non-oil sector, low incentives for private sector development, and weak institutional and governmental capacities. For example, Singh and Laurila (1999) noted the euphoria of Azerbaijani officials after they signed oil and gas contracts with Western MNCs due to easy money in the form of FDI. The authors also argued that the upcoming boom in oil revenues could overshadow non-oil industrial development. Governmental authorities could always race for oil rents and neglect the work required to reform non-oil manufacturing sectors. Moreover, Singh and Laurila (1999) highlighted the possibility of exchange rate overshooting, which could result from rising oil revenues in the medium and long term. This tends to occur when governments continue reckless public spending policies fueled by high oil revenues. These claims were well founded and based on the experience of other mineral-rich countries examined for the NRC or DD. Reports by the World Bank (1996; 1999; 2003), the EBRD (1995; 1997; 2000; 2003), and the IMF (1995; 1998) also warned Azerbaijani officials of the possible DD effects of economic development focused unilaterally on the oil industry. Nevertheless, from a methodological perspective, the simple assumption that DD is caused by the role of the extractive industry in Azerbaijan's economy is unsatisfactory. A more targeted and specific approach should be adopted to track the signs and symptoms of DD.

After empirically comparing FSU and CEE countries, De Broeck and Sløk (2001) claimed that exchange rate appreciation posed a real threat to post-Soviet countries. The authors found that in the 1990s, exchange rate appreciation was caused by productivity growth in CEE. However, resource-rich post-Soviet countries failed to cope with undesirable exchange rate appreciation in parallel with low productivity growth rates. However, as Laurens (2002) noted, prior to the implementation of the largest pipeline project (i.e., the BTC), there was only concern about the signs of DD, not the necessary preconditions for it in Azerbaijan.[89] Among these concerns was the lack of incentives for the Azerbaijani government to promote the non-oil sectors. Before

[89] However, O'Lear (2001) emphasized the increasing role of oil prices in the Azerbaijan economy could be seen even 4-5 years before the BTC became operational.

the construction of the BTC, a bonanza of oil revenues did not occur and the signs of DD were not clear enough in official statistics. After the oil boom, some experts expected significant growth in non-oil production through domestic investment and diversification policies. Azerbaijan actually lacked the financial resources as well as the will to sponsor any significant non-oil manufacturing projects until 2005. As official statistics and published articles demonstrate, this situation did not change after the oil boom began in 2005 and peaked in 2011 (Ibadoghlu 2021).

Although Rosenberg and Saavalainen (1998) were optimistic about the management of Azerbaijan's oil revenues, they still suggested taking action against the expected signs of DD. They observed high inflation, low public consumption, rising output of the oil and non-tradeable sectors, and a shrinking non-oil manufacturing sector. Following Laurila and Singh (2001), one can conclude that the lack of preparation for the huge mineral revenues was due to the high level of corruption in the government. Simultaneously, a weak financial sector, an underdeveloped private sector, and a lack of political democracy exacerbated expectations of negative effects from oil-driven economic growth. Moreover, concerns about DD were usually accompanied by reasons related to the political economy and economic diversification. Therefore, when Kaser (2003) and Mahnovski (2003) stated that the low levels of political and economic diversification of Azerbaijan's economy posed a risk and fell under the NRC or DD, this can be understood as a logical conclusion to observations of Azerbaijan at that time. Their main argument was based on similar economic expectations of the resource-based development strategies in the Caspian Basin countries. These were authoritarian and exhibited rent-seeking behavior, which was a common political and economic reality.

Furthermore, Kamrava (2001) was one of the first to predict that DD in Azerbaijan's economy was likely. The author focused on the uneven outcome of the privatization campaign, inefficient bureaucracy, and transparency problems. These were the main institutional challenges to building sustainable economic development. A heavy dependence on oil, corruption, and a reluctance to privatize the banking sector exacerbated the problems in Azerbaijan's economy (Kryukov 2005). Political, governance, and institutional failures following a systemic change usually lead to failure in efficiently managing windfall revenues and building a diversified economic structure (O'Lear 2001). These developments resulted in the inability of domestic economic sectors to absorb the colossal oil revenues and productivity.

Studies that have directly analyzed the signs and symptoms of DD in Azerbaijan's economy were mostly conducted in 2009 and 2010, but the process is still ongoing. The authors cited in the next subsection took a more focused approach, and the available statistical data allowed them to be more methodologically conclusive.

3.2.1.2. Direct investigations

Gahramanov and Fan (2002) conducted the first empirical and direct analysis of DD in Azerbaijan's economy. They used an adapted version of the Balassa–Samuelson model, which explains how a country's national currency appreciates in value due to efficiency growth in tradeable sectors. Indeed, the oil boom in Azerbaijan occurred in a tradeable sector. In other words, domestic inflation and REER appreciation are the main signs of DD in the oil sector, and they were also included in the Balassa–Samuelson model. Thus, this approach could explain why REER appreciation by the oil industry is possible. However, the authors excluded the possibility of DD in Azerbaijan's economy because the expected monetary signs of DD, such as oil-related inflation and exchange rate appreciation, were absent. Notably, however, in 2001/02 when the paper was written/published, the full extent of the oil boom was not yet apparent. Moreover, the statistical data were poor for such a study. When the BTC became operational in 2005 and 2006, more statistical data, systematic studies, and empirical research on DD in Azerbaijan began to appear. In fact, Hwang et al. (2010) argued that there was no well-established long-term relationship between oil prices and the Azerbaijani exchange rate before the construction of the BTC. Therefore, the work of Gahramanov and Fan (2002) lacked the data necessary to fully investigate the DD phenomenon in Azerbaijan.

Hwang et al. (2010) concluded that due to the construction of the BTC, increased oil exports and oil prices affected the exchange rate more than domestic productivity growth. This strengthened the local currency and weakened the competitiveness of non-oil manufacturing sectors. Hasanov and Samadova (2010) documented a negative impact of REER appreciation on non-oil GDP[90] between 2002 Q3 and 2009 Q3 by applying the vector error correction method (VECM). Similarly, Hasanov (2010) demonstrated that Azerbaijani currency appreciates by 0.7% when oil prices increase by 1%. Moreover, the author discussed the signs of DD in light of the cointegration relationship between oil prices and real exchange rates. Studies by Huseynov (2009), Ağazade (2018), and Dikkaya and Doyar (2017) have also found

[90] Not only non-oil manufacturing, but also non-tradeable sectors.

similar relationships between oil price shocks and price levels in Azerbaijan. The aforementioned studies have emphasized the patterns of chronic exchange rate and inflation increases coinciding with DD syndrome.

As available statistical data accumulated with developments in Azerbaijan's economy, more thorough studies also appeared on DD. Hasanov (2013) conducted one of the most crucial. According to his results, a positive long-run relationship exists between public spending and non-oil GDP. They also indicated that the spending effect of DD is more pronounced compared with the resource movement effect, as oil revenues are the main source of government spending. In other words, the transfers from SOFAZ to the state budget financed public spending rather than tax revenues. In Azerbaijan, the weak presence of the resource movement effect is mainly related to the capital intensity of the oil sector. Uçan and Ünal (2018) also found evidence of the spending effect of DD by applying methods such as FMOLS regression and the Granger causality test between 1996 and 2016 in Azerbaijan.

Yun (2018) argued that Azerbaijan has undergone significant de-industrialization—a crucial element of DD theory—because the oil industry has dominated GDP output and exports and crowded out non-oil tradeable sectors. Furthermore, chronic appreciation of the REER exacerbated the decline in non-oil competitiveness, even more so than in other oil-rich FSU countries (e.g., Russia and Kazakhstan). This provides support for claims of oil-related de-industrialization in Azerbaijan (Niftiyev 2020a; Azizov 2021). Moreover, Yun (2018) recommended that policymakers implement structural reforms to overcome vulnerabilities to international commodity markets; otherwise, oil prices will continue to determine the main directions of the ongoing de-industrialization of Azerbaijan's economy.

Zulfugarov and Neuenkirch (2019) analyzed the decline in quarterly oil and non-oil GDP after negative oil price shocks in Azerbaijan between 2002Q1 and 2018Q1. Applying linear vector autoregressive models, they found that GDP per capita and total trade turnover had been positively affected by oil price increases (Zulfugarov–Neuenkirch 2019; Mukhtarov et al. 2021). In addition, oil price slumps have significantly affected Azerbaijan's economy through reduced government subsidies for non-oil sectors and the less profitable oil sector (Zulfugarov–Neuenkirch 2019). Recent studies by Czech and Niftiyev (2021) and Shahin et al. (2021) have also demonstrated that oil prices strongly determine the value of the manat. During periods of high oil prices, the national currency appreciates, resulting in low competitiveness of non-oil manufacturing exports. By contrast, during periods of low oil prices, such exports become more competitive.

Since 2014–15 (i.e., the end of the commodity boom), the number of studies examining DD syndrome in Azerbaijan's economy has increased. For instance, Niftiyev and Czech (2020) documented the impact of DD on vegetable export markets. According to their findings, vegetable exports were lower during periods of high oil dependence, as measured by the extractives dependence index (EDI). Moreover, vegetable exports were higher when the EDI decreased. The EDI considers many DD-related economic indicators, such as the share of booming and non-booming sectors in value-added, the revenues they generate, and the fiscal balance of the economy. The study of Niftiyev and Czech (2020) suggested that DD's impact can occur not only at the aggregate level, such as oil, non-oil, or non-tradeable, but also at the subsector level.

In Azerbaijan's economy after the recession period (1991–94), the dependence on oil, appreciation of the national currency, increase of real wages in the mining sector, slowdown of the non-oil industry, and growth of the state-sponsored non-tradeable sector coincided. Niftiyev (2020a) claimed that these signs of DD were present in the economy. Niftiyev (2020b) applied the same logic to labor markets to determine whether there were signs against REER appreciation. He concluded that the resource movement effect was rather weak compared with the spending effect of DD, which was also reflected in employment dynamics.

Moreover, Yıldırım Mızrak and Gurbanov (2013) stated that the spending effect was more visible due to high government spending on infrastructure projects. A certain strand of literature also focused on the sloppy application of techniques that led some to conclude that signs of DD existed in Azerbaijan. They either predicted the wrong trends in economic indicators or failed to examine the necessary and crucial parts of DD syndrome based on the original theory of Corden and Neary (1982) and Corden (1984). Bayraç and Çemrek (2019), for example, erroneously concluded that Azerbaijan has signs of DD. This was based on a causal relationship between oil consumption and economic growth. The finding was not supported by any DD-based theoretical framework, and the authors overlooked critical aspects of DD, such as the movement of resources from lagging to booming sectors and government spending. The same fallacy was committed by Şanlisoy and Ekinci (2019) when they analyzed the relationship between GDP and crude oil prices. The authors ignored the fact that DD cannot be identified solely by examining the relationship between GDP and crude oil prices. They, like Bayraç and Çemrek (2019), also attempted to examine DD in Azerbaijan's economy, but they failed to examine the crucial elements of the DD framework, such as the REER, distribution of sectoral output, and employment. This led the authors to categorically deny the existence of DD syndrome in Azerbaijan's economy.

Furthermore, Majidli (2022) found that non-oil exports are negatively affected by oil production, mainly through the resource movement effect of DD. He also found that an increase in oil prices positively affects non-oil exports in the long run. This positive effect is due to the subsidies that the Azerbaijan government usually provides after oil revenues are transferred from SOFAZ to the state budget.

3.2.1.3. Indirect investigations

Indirect investigations of DD in Azerbaijan's economy mainly include studies that analyze fiscal policy, government spending behavior, or domestic inflation dynamics, which are the key aspects of DD. Such studies are all mainly concerned with the spending effect of DD.

The main features of the spending effect include high government spending during periods of increased commodity prices (procyclical fiscal policy) and high shares of windfall transfers to the state budget. Non-tradeable sectors also increase their share of total value-added due to increased state-sponsored infrastructure projects. Usui (2007) noted that Azerbaijan was careless with its oil revenues and spent immediately during oil price spikes. No institutional regulations were implemented, and the government saved less for future generations. This has led to procyclical fiscal policies and made the country vulnerable to unpredictable oil price fluctuations. After applying OLS, autoregressive distributed lags (ARDLs), and other techniques, Aliyev et al. (2016) also found a positive long-run relationship between public spending and non-oil GDP between 2000Q1 and 2015Q2. Their results were consistent with those of Hasanov (2013), who found that oil revenues are the main source of public expenditure. They also drive up domestic prices.

An oil boom drives up expectations and contributes to authorities' overestimation of further revenues. Hayat et al. (2013) noted an appreciation of the REER in Azerbaijan due to the government overestimating oil reserves and relying more on mineral revenues. This in turn leads to a loss of control over government expenditure, especially when the government embarks on costly public infrastructure projects. Such projects are also often accompanied by foreign borrowing. The overall result is a loss of fiscal discipline, which fuels inflation, foreign debt accumulation, and the spread of corruption. Therefore, in the case of Azerbaijan, an expected nexus may exist between economic growth and government spending, which is actually a significant part of the spending effect of DD. For instance, Sabiroglu and Bashirov (2013) tested Wagner's law, which examines the relationship between economic growth and the public sector's share of the economy. Although their study did not address DD syndrome, the authors examined the role of oil prices in government spending in Azerbaijan. They found that public sector spending increased sharply after favorable oil price peaks, beginning in 2005. Their findings support the results of an earlier study by Koeda and Kramarenko (2008), who found that non-oil sector growth and total factor productivity growth in Azerbaijan were caused by high government spending. Moreover, Guliyeva et al. (2021) claimed that oil revenues and government spending in Azerbaijan's state budget are strongly linked to oil prices, resulting in inefficient and procyclical fiscal policies.

The appreciation of the national currency may reflect the change in trade dynamics. For example, Dikkaya et al. (2018) analyzed the relationship between oil prices and the volume of imports from Turkey to Azerbaijan. The authors reported an increase in imports during periods of higher oil prices, implying that Azerbaijan has more purchasing power because of oil revenues. Simply put, imports became cheaper, leading to a high propensity to consume during the oil boom period. These results highlight the importance of currency appreciation and depreciation in relation to key macroeconomic indicators. Similarly, Bahmani-Oskooee and Jamilov (2014) reported positive and significant responses of non-oil sectors in Azerbaijan to currency devaluation shocks. When the local currency is devalued, exports to major trading partners in the EU increase. These authors' conclusion invites a reexamination of the impact of DD on trade patterns (i.e., harmful and debilitating effects of an appreciated exchange rate).

In summary, the aforementioned studies, even if they did not deal directly with DD, have covered the crucial elements of the theory, such as oil prices, government spending, exchange rate appreciation, and reckless fiscal policy.

3.3. De-industrialization

This section discusses the literature on de-industrialization at both the global and Azerbaijani levels. It then presents the chemical industry as a whole and its major trends.

3.3.1. Concepts of industrialization and de-industrialization

The Merriam-Webster English dictionary defines a nation's industry as "manufacturing activity as a whole," which essentially means "the process of producing products through the use of machinery and factories" (Merriam–Webster 2021). Industrial production enables the production of material goods that cannot be cultivated on land (Hewitt et al. 1992). Due to productivity advantages over other sectors and higher positive externalities resulting from its growth, industrialization—particularly manufacturing that produces durable goods—is considered an engine of economic growth throughout the global economy (Szirmai 2012). These definitions assume that industrialization is a society-wide process of increasing the production of goods and services, in turn leading to greater wealth (Kiely 2005). Manufacturing has played a central role in raising the level of economic development and contributed to poverty reduction (Szirmai 2012). By contrast, de-industrialization can be seen as a threat that forces policy makers to continue wealth creation through industrialization.[91]

A consensus exists that Clark (1957) followed by Kaldor (1966) were the first to use the term "de-industrialization" in their articles (Kandžija et al. 2017). De-industrialization has been defined as the decline in the share of industry in total output and employment (Saeger 1997; Tregenna 2014; Rodrik 2016), which is the opposite of industrialization. Nevertheless, it differs from terms such as destructuring or restructuring of industry (Koritz 1991).[92] Similarly, Gregory et al. (2009) described de-industrialization as a decline in industrial activity and capacity, particularly in manufacturing. Villanueva and Jiang (2018: 162) defined de-industrialization "as the

[91] Industrialization necessitates a greater use of new technological processes and ways of research and development, as well as a more skilled and productive labor force and entrepreneurial cadre (Cypher–Dietz 2008). Industrialization increases physical capital investment at the enterprise level and across the economy, including the creation of physical and social infrastructure (Cypher–Dietz 2008). As a result, the key message of this literature review is that authorities should pay attention to role and share of manufacturing in national economies and take action if the de-industrialization phenomenon occurs on a large scale as manufacturing positively impacts economic growth (Szirmai–Verspagen 2015; Cantore et al. 2017; Attiah 2019).

[92] Sood and Kohli (1985) describe restructuring of the industry as the natural response to the challenges like declining productivity, economic losses, and diminishing market shares. Therefore, the restructuring of industries or enterprises allows them to adjust for increased competitiveness. Also, unlike de-industrialization, restructuring does not lead to massive industrial employment and output collapse.

change in the production technique that involves a decrease in labor productivity and an increase in capital productivity." In the UK in the 1960s and 1970s, concerns about the slowdown in economic development caused by industry led economists to begin studies of de-industrialization. For instance, Kaldor (1966) focused on the British case, and Singh (1977) characterized de-industrialization as a structural imbalance in the UK. While productivity and price competitiveness were rising in the UK, manufacturing was losing its overall competitiveness due to inefficiencies in production. Put differently, Singh (1977) argued that a decline in manufacturing employment cannot be considered de-industrialization if productivity and output levels remain the same. In the UK, de-industrialization was a symptom rather than a cause of structural problems.

The process of economic development and becoming a developed nation is attributed to the evolution of economies from agriculture to manufacturing, and from manufacturing to services (Clark 1941; Kuznets 1957; Chenery 1979; Fuchs 1980; Cypher–Dietz 2008). Economic development and growth lead to structural changes "in what is produced, in how production is organized, in labor use, and for whom production is ultimately destined" (e.g., the domestic market versus the export market; Cypher–Dietz 2008: 268). Economic research took off in the second half of the 20th century, with a clear emphasis on the importance of manufacturing and industrialization.

Manufacturing boosts economic growth by shifting from activities with low to those with high productivity levels (as cited in Pandian, 2017; Lewis 1954; Cornwall 1977). This provides a way out of an unfavorable specialization in primary goods (Frank 1967). Supply and demand—and hence price levels for primary goods and natural commodities—tend to be volatile. According to Prebisch (1950, 1959, 1964) and Singer (1950, 1975), the so-called old orthodoxy argues that as countries' economies continue to grow, demand for manufactured goods will increase more than the demand for primary goods. In turn, the terms of trade (TOT) for exporters of primary goods will deteriorate relative to those of industrialized countries.[93] Countries that overproduce, exporting primary goods and importing mostly manufactured goods, do not only experience instability in their TOT due to volatile commodity prices; their purchasing power for manufactured goods will also deteriorate in the long term (Cypher–Dietz 2008). Kindleberger (1956, 1958) supported Prebisch and Singer's

[93] The Prebisch–Singer hypothesis.

thesis but found no evidence for the difference in TOT between primary and manufactured goods at that time; rather, he found a significant difference between the TOT of underdeveloped and industrialized (developed) countries.[94] This was actually a roundabout way of confirming the Prebisch–Singer hypothesis. Later, Harvey et al. (2010: 376) provided more direct evidence. They found that "overall, eleven major commodities[95] provide new and robust evidence of a long-run decline in their relative prices." Thus, industrialization creates a productive domestic economic structure for achieving higher economic growth, which allows developing countries to have similar export and import patterns (Cypher–Dietz 2008). Ultimately, the message of the old orthodoxy was that no country can develop without a strong manufacturing sector because the economic value of primary goods is unstable (Acharya 2007).

Rowthorn and Ramaswamy (1997) argued that manufacturing is a technologically advanced sector of the economy in which more can be produced over time with less labor. This is not readily possible in other sectors. In particular, manufactured products are highly standardized and mass produced, while certain services (e.g., medical care and catering) cannot be easily standardized. Although the telecommunications sector is as technologically advanced as manufacturing, productivity growth in key service subsectors is slower. Therefore, as the role of services in the economy increases and the share of manufacturing decreases, the average long-term growth of the economy will depend on productivity growth in the service sector. In the short and medium term, however, the service sector may not be able to support the growth of the economy.

In the literature, more recent examples demonstrate the importance of industrialization for a country to reach a higher level of prosperity. For example, Fagerberg and Versbagen (1999, 2002) regressed real GDP growth rates and manufacturing growth rates in 76 countries. They concluded that industrialization led to higher growth rates in Latin America and the East Asian region. By contrast, the benefits of industrialization were smaller in advanced economies, with the exception of the 1950–1973 period. Other recent studies have focused on low- and middle-income countries, such as South Africa and other African countries (Olamade–Oni 2016;

94 Between 1913 and 1952, "the net barter terms of trade of Western Europe improved by 50% vis-a-vis the "underdeveloped areas of the world outside of Europe" (Kindleberger, 1955, p. 290).

95 Aluminum, coffee, jute, silver, sugar, tea, wool, zinc, hide, tobacco, and wheat are just a few examples.

Moholwa 2017), Turkey (Ozturk–Altinoz 2018), and some Central and Eastern European countries (Ulbrych 2017). They have attempted to defend the thesis that manufacturing plays a crucial role in the growth of the economy.

Industrialization has also played a vital role in emerging economies catching up with high-income countries (Rodrik 2011; Szirmai et al. 2013). Hausman et al. (2007) and Hidalgo et al. (2007) have demonstrated that manufacturing helps achieve higher levels of economies of scope "with countries that can produce larger varieties of goods" (Haraguchi et al. 2019). Thus, developing countries can rapidly grow their economies. Rodrik (2007) argued that rich countries become rich because of the wide variety of goods they produce, not just because of their ever-increasing industrial output per se. Rodrik (2013) also analyzed a large sample of countries and documented unconditional convergence of productivity only in manufacturing. This gives low-income countries the opportunity to rapidly exploit their economic potential to catch up with high-income countries. However, both developed and developing countries face major risks from de-industrialization.

According to Rowthorn and Wells (1987), de-industrialization can be both positive and negative. If the service sectors can absorb the excess labor created by unemployment in manufacturing, then this is positive de-industrialization. However, if the service sector cannot absorb the excess labor, the economy would experience negative de-industrialization.[96] Rowthorn and Wells (1987) also proposed a third type of de-industrialization, namely trade de-industrialization. This occurs when net manufacturing exports move away from non-manufacturing exports of goods and services. Trade de-industrialization illustrates the external factors that can lead to de-industrialization. In other words, the following are usually considered internal factors of de-industrialization: "result[s] of the interactions among changing preference patterns between manufactured and services, the faster growth of productivity in manufacturing

[96] Felipe et al. (2018) argued that manufacturing employment is more important than manufacturing output, as in the countries where manufacturing employment takes more than a share of 18% of overall employment, the economic well-being—measured by the population income—is high. This is not surprising, as the literature pointed out that manufacturing sectors successfully absorb the excess agriculture labor force (McMillan–Rodrik 2011; Timmer et al. 2015), and manufacturing share of employment statistically significantly affect economic growth (Pandian 2017). Also, manufacturing employs social labor rather than isolated labor, thus benefiting the overall economy when the state must protect and nourish industries to support nation-building according to Frederick List's approach (German-U.S. economist who believed tariffs on imported goods would stimulate domestic development, Cowen–Shenton 1996). However, agriculture and industry employment has been decreasing across the global economy since the 1970s to reach 30% in overall employment altogether (Iversen–Cusack 2000). Notwithstanding, the importance of manufacturing employment for economic growth is still important for both developed and less developed countries (Pandian 2017).

compared to services, and the associated relative decline in the price of manufactured goods" (Rowthorn–Ramaswamy 1999: 34).

A particular type of de-industrialization is also found in middle-income and developing countries, which Rodrik (2016) termed "premature de-industrialization." Premature de-industrialization means that certain developing countries peak in manufacturing at earlier stages of economic development than developed industrialized nations do. Haraguchi et al. (2019) highlighted that the rise of the service sector and the rapid development of breakthrough technologies—such as automation—have led to a decline in the role of industrialization in developing countries' economic growth. However, in transitional and post-socialist countries, de-industrialization may occur due to the transition process from a command economy to a market economy. Mickiewicz and Zalewska (2001, 2002, 2006) referred to this type of de-industrialization as "forced de-industrialization." Tomljanović et al. (2018) summarized the aforementioned authors' main ideas and concluded the following: If the transition period is efficient, industry employment is low only during the transition period; once the economy recovers from severe transition shocks, industry employment increases; however, if the transition period is inefficient, then only industrial employment in the primary sectors will prevail.

Su and Yao (2017) argued that the weak performance of the manufacturing sector and the strong position of the service sector may send bad signals to the governments of developing countries, as only the manufacturing sector provides positive externalities on services. Furthermore, according to their findings, the manufacturing sector not only creates incentives for saving among the population but also promotes technological accumulation in the country. Nevertheless, between 1990 and 2010, manufacturing employment began to have a less positive effect on growth in less developed countries worldwide (Pandian 2017). Pandian's findings invite one to consider the importance of manufacturing employment in a more complex sense. That is, the reorganization of manufacturing activities worldwide is changing the ability of manufacturing to contribute to growth in less developed countries. Nevertheless, manufacturing has a positive impact on growth and is necessary for development.

Here, the following question arises: Do the most current studies support the assumption that there is de-industrialization in developing countries? Kruse et al. (2021) argued that it was too early to state that developing countries have experienced de-industrialization. The authors documented significant employment industrialization for many countries in sub-Saharan Africa and Asia. They mentioned that a noticeable de-industrialization process occurred until the early 2000s, but then the trend was reversed (Kruse et al. 2021). Although Erubman and Vries (2021) supported these findings, they also reported low and even negative productivity levels for many sub-Saharan African countries, where poverty cannot be reduced due to sluggish structural transformation. In other words, even if developing countries somehow defeat de-industrialization, they will repeat the success stories of the old industrialized countries. This is because productivity growth in manufacturing, measured by the median level of per capita income, does not approach that of high-income countries.

Although some countries de-industrialize faster than others, Rowthorn and Ramaswamy (1999) argued that de-industrialization is not necessarily undesirable. They argue that the majority of the labor force is employed in manufacturing and services; therefore, the evolution of employment shares is largely determined by output and productivity growth in these two sectors. Despite similar growth rates in output, the authors found that labor productivity grew much faster in manufacturing than in services. Thus, unemployed workers in manufacturing are absorbed by the service sector, but the service sector has slow productivity growth (also see Rowthorn–Ramaswamy 1997).

De-industrialization is the systematic reduction of the productive capacity of the economy (Bluestone–Harrison 1982, as cited in Kandžija et al. 2017; Bluestone 1984). Its determinants and causal factors can be internal or external. The main internal determinants include the following: GDP per capita, economic expansion or recession, structural changes (Kandžija et al. 2017), labor productivity growth, investment in manufacturing, and declining demand for manufactured goods—or a shift in consumer spending to services (Rowthorn–Ramaswamy 1997). The external factors of de-industrialization include trade patterns (Kucera 2003; Bogliaccini 2013) and globalization (Saeger 1997; Alderson 1999; Van Neuss 2018). In fact, several studies once argued that increased North–South trade led to de-industrialization among the advanced economies—namely the USA, European countries, Japan, and even the Asian Tigers—due to the rapid growth of labor-intensive manufacturing in low-income countries (Rowthorn–Ramaswamy 1997).[97] The literature has clearly captured the role of North–South trade in de-industrialization (Burgstaller 1987; Sachs–Shatz 1994;

[97] This is the model that explains how trade between the North or core and the South or periphery leads to the growth of developing countries (Abdenur 2002).

Wood 1994, 1995; Saeger 1997); however, Rowthorn and Ramaswamy (1997) argued that it has little to do with de-industrialization. De-industrialization began in successful advanced countries as the result of effective economic development due to productivity growth and the rise of services (Rowthorn–Ramaswamy 1997). Moreover, real domestic spending on manufactured goods remained relatively stable; instead, it was spent on imported goods (Rowthorn–Ramaswamy 1997). Kang and Lee (2011) demonstrated that de-industrialization is mainly caused by internal and external factors, namely labor productivity growth, changes in demand, and trade patterns.

Although it is increasingly difficult to follow the classical industrialization-led economic growth based on productivity growth, recent studies have reported the growth-enhancing role of FDI in manufacturing. In some economies, FDI in services fails to boost overall growth and even leads to de-industrialization (Doytch–Uctum 2011). Moreover, advanced economies are responding to growing competitive pressures from China and India with the Fourth Industrial Revolution (Industry 4.0[98,99]), which provides flexibility and quality in production systems to meet the demands of innovative business models (Khan–Turowski 2016). Manufacturing that generates high added value and ensures sustainable production requires a higher degree of digitalization (Möller 2016) and "the promotion of a tight connection between science and the economy" (Zhou 2013: 7). In other words, industrial production continues to evolve but retains its role as growth engine, despite the ongoing de-industrialization in developed and developing countries.

3.3.2. De-industrialization in the case of Azerbaijan

De-industrialization as a separate issue has received little attention in Azerbaijan's economy (for early reflections, see Malik 2010; Gurbanov 2013). Some studies have mentioned de-industrialization or relative de-industrialization based on the increasing role of the service sector due to government spending (e.g., Hasanov 2013). Other studies have been descriptive and unable to clearly explain the de-industrialization process (e.g., Niftiyev 2018). To study the broader economic outcomes of oil-led growth and development since 1991 and gain a thorough understanding of their impact

[98] Khan and Turowski (2016: 17) defined Industry 4.0 as "a revolution enabled by the application of advanced technologies (like IT) at the production level to bring new values and services for customers and the organization itself."

[99] Industry 4.0 and the idea of sustainable growth are examples of an "industrial renaissance," which Yoshikawa (1995) said were necessary to keep manufacturing as a source of growth and prosperity.

on the diversification status of the national economy, the de-industrialization process in Azerbaijan must be analyzed.

Since their independence in 1991, post-Soviet resource-rich countries have been studied for signs of DD- or REER-induced de-industrialization. Usually, empirical studies use the REER as an indicator of the competitiveness of tradeable sectors. For example, Egert (2012) reported significant REER and NEER appreciations in Southwest Asia—including Azerbaijan—when oil prices increased. Yun's (2018) recent study on selected post-Soviet oil-exporting countries demonstrated that DD and de-industrialization pose real threats to post-Soviet countries. His results indicated that the de-industrialization process is more pronounced in Azerbaijan than in Russia and Kazakhstan, as measured by the decline in manufacturing employment. However, he did not find any significant impact of REER appreciation on manufacturing employment in Azerbaijan or other oil-exporting post-Soviet countries.

According to Mikayilov and Najafov (2019), not only did REER appreciation negatively impact the share of manufacturing in Azerbaijan's GDP but also high interest rates. High interest rates prevented manufacturing firms achieving sustainable production levels due to limited access to financial capital. Noteworthily, the authors found a negative correlation between the ratio of credit to value-added and the share of manufacturing in GDP. High interest rates contributed negatively to manufacturing firms' costs, reducing their competitiveness and production capacity (Mikayilov–Najafov 2019).

The de-industrialization literature on Azerbaijan's economy is sparse, as this process has hardly been studied. Therefore, the present study contributes to the literature by by elucidating a specific non-oil manufacturing subsector, namely the chemical industry. Thus, it provides a focused perspective on the industrial realities in Azerbaijan.

3.4. The chemical industry at a glance

Heaton (1993) asserted that although the use of chemicals dates back to ancient civilizations, the chemical industry in its present form did not emerge until the Second Industrial Revolution of the 1800s. The chemical industry makes extensive use of "fossil-resources such as minerals, natural gas, oil, coal, air, and water as raw materials to produce more than 60,000 different chemical-based products" (Mohan–Katakojwala 2021: 1). In the early years of this industry's rise, alkali for soapmaking, silica and sodium carbonate for glassmaking, and bleaching powder for cotton were the main inorganic chemicals that it produced for other manufacturing sectors (Heaton 1993). Then, in the 1860s, the organic chemical industry began to develop following "William Henry Perkin's discovery of the first synthetic dyestuff—mauve" (Heaton 1993: 1). From 1950 onwards, the organic chemical industry experienced explosive growth, which accelerated with the development of petrochemicals in the 1960s and 1970s; in particular, this was because of the increasing demand for synthetic polymers, such as nylon, polyester, epoxy resins, polypropylene, and polyethylene (Heaton 1993). The chemical industry started to provide various resources for a wide range of economic sectors.

The products of the chemical industry are used in "health, agriculture, transportation, food, energy, environment, consumer goods, etc., [and] include the product categories of pharmaceuticals, agrochemicals, pesticides, basic and specialty chemicals, fibers, detergents, functional materials, petrochemicals, polymers, and fuels" (Mohan–Katakojwala 2021: 1). The chemical and petrochemical industries supply inputs to technology-related companies in the form of reagents or intermediates. However, the chemical industry supplies the most critical inputs for certain sectors of the economy, including the following: pharmaceuticals, rubber and plastic products, construction, computers and electronic equipment, furniture, cars and trailers, agricultural product and food packaging, and containers (e.g., bags, trays, and mats; Abbasov–Aliyev 2018). The chemical industry takes small quantities of raw materials, such as oil and natural gas, and converts them into high value-added industrial or consumer goods (Heaton 1993). The relative value of typical petrochemical products is 10 times that of crude oil, while typical consumer goods have a value 50 times that of the raw material (Heaton 1993). In addition, the chemical industry is a high-technology industry that benefits from recent advances in electronics, engineering, and computer technology, which are capital- rather than labor-intensive (Heaton 1993). The chemical industry has high value per unit as opposed to high-volume products (Heaton 1993).

Following the First Industrial Revolution, the chemical industry experienced different growth rates in different countries. According to Aftalion (2001), each country concentrated on specific areas of the European continent. Germany, for example, established its first chemical laboratories and, by 1914, the German chemical industry had a 75% share of the world market (Lesch 2000). Italy produced over 900,000 tons of superphosphates per year at the time (Aftalion 2001). The Nitro Nobel Company, founded by Alfred Nobel in Sweden in 1864, specialized in the production of dynamite (Aftalion 2001). The production of fertilizers, carbides, and chlorates also took off in Sweden due to increasing hydroelectric power generation. Aftalion (2001) stated that the French Revolution isolated France from the rest of the world, which favored the chemical industry. The decline in imports from countries such as Italy, Spain, the UK, Peru, and India forced local elites to focus on domestic raw materials to produce various chemicals for the rest of the economy. As a result, by the end of 1810, French industry was able to produce "20,000 tons of sulfuric acid, 10,000–15,000 tons of Leblanc soda, and 600 tons of hydrochloric acid" (Aftalion 2001: 14). By 1835–36, Britain's chemical industry was self-sufficient, producing sulfuric acid, Leblanc soda, hydrochloric acid, and similar chemicals (Aftalion 2001).

In developed countries today, it is safe to assume that the chemical industry has already matured and even slowed. However, around the early 1990s, oil-rich developing countries such as Saudi Arabia and Mexico expanded their production of basic alkene and aromatic petrochemical intermediates, achieving high rates of growth in chemical manufacturing (Heaton 1993). Developing energy-rich countries focused on the specific chemical subsectors, where they could obtain stable raw materials and cheap energy sources (Jonnard et al. 1985). As a result, countries such as Russia, Brazil, India, Indonesia, China, and South Africa increased their share of annual global chemical sales from 13% to 28% (UNEP 2012). Moreover, despite its late entry into the chemical market, China has been the world's largest chemical producer in terms of revenue since 2011 (Hong et al. 2019, as cited in Chen–Reniers 2021). All of this demonstrates the importance of considering the chemical industry as a critical component of the industrialization of developing countries, of which Azerbaijan is one. Azerbaijan is rich in oil, natural gas, and other minerals. In the years of the USSR, chemicals represented one of the main directions of industrialization; however, the years since independence present a complicated picture.

3.5. The chemical industry and Azerbaijan's economy

The development of Azerbaijan's chemical industry was closely connected to oil refining. The first commercial and industrial oil extraction in the world occurred on the Absheron Peninsula in 1847; later, the Dubin brothers opened an oil refinery in 1859 (Bagirov 1996). Since the mid-18th century, oil production and refining in Azerbaijan have steadily developed and opened up new opportunities for other industries, such as the chemical industry. In 1913, for example, the Nobel brothers succeeded in producing sulfuric acid using the Tentelev contact process in Baku (Aftalion 2001). Sulfuric acid was used primarily in oil refineries to wash impurities out of gasoline and other refined products (The Columbia Electronic Encyclopedia 2012). Moreover, sulfuric acid produced in Baku was intended for the production of other chemicals, such as sodium sulfate, hydrochloric acid, chlorine (through the Weldon process), and bleaching powder (Aftalion 2001). The production of sulfuric acid continued during the Soviet Union period. At the beginning of the 20th century, the chemical industry established various factories in Azerbaijan, which produced, among others, sulfuric acid and caustic soda. Among these chemical enterprises, Azerbaijani entrepreneurs accounted for 10% of all owners (Seyidzada 1998).

In 1928, five-year plans (1928/29–1932/33) aimed at developing industry were adopted (Ibrahimli–Aziz 2011). However, few industries were developed in the early years of the Soviet Union. The rapid development of the chemical industry in Azerbaijan actually dates back to the 1950s and 1960s.

In 1938, the construction of synthetic rubber factories and other chemical plants began in Sumgait, Azerbaijan’s second largest city. With the outbreak of the Second World War, the construction works in Sumgait were stopped. After the war ended in 1945, however, heavy industrial plants—chemical, pipe-rolling, synthetic-rubber, aluminum, and superphosphate—were put into operation there. The Sumgait Chemical Plant, commissioned in 1966, was considered the largest petrochemical plant in Europe at the time (Azerbaijans.com). In the 1970s and 1980s, these factories were operating at full capacity, exporting products to almost all parts of the FSU. This economic growth helped to make Sumgait one of the largest cities in Azerbaijan (Azerbaijans.com).

In 1981, the construction of the EP-300 complex for the production of ethylene and propylene, a valuable petrochemical product, began in Sumgait, based on modern, high performance, and waste-free technology with a high production capacity. Today, based on the EP-300 plant, the Sumgait Ethylene-Polyethylene Plant currently produces high-quality polyethylene, which is in high demand in world markets. It is also a crucial source of raw materials for the growing chemicals complex in Azerbaijan (Strategic Road Map for the National Economic Prospects of the Republic of Azerbaijan 2016).

The recent development of the chemical industry has also benefited significantly from Azerbaijan's rich hydrocarbon resources. However, compared to the years before and during the Soviet Union, the post-Soviet years were mainly known for the fact that the chemical industry was supported by SOCAR. In other words, not only the inputs for the production process, but also the constant state financing and investments were tied to the oil sector. Nevertheless, in terms of production, the chemical industry is a part of Azerbaijan's economy that is not part of the oil sector.

Suleymanov and Turkan (2019) summarized the main developments in the Azerbaijan’s chemical industry as of 2001 as follows: To successfully develop one of the key sectors of the Republic of Azerbaijan (i.e., the chemical industry), lead it out of the crisis, and solve related problems, the state-owned enterprise Azerikimya Production Union (PU) was established on the basis of existing enterprises. Since the establishment of Azerikimiya PU did not lead to the desired results, the Decree of the President of the Republic of Azerbaijan dated March 21, 2001, titled “On Privatization of Enterprises of the Chemical Industry,” privatized most of the enterprises that were part of Azerikimiya PU. Four enterprises remained as part of Azerikimya PU: Sintez-Kauchuk, Organic Synthesis, Surfactants, and Ethylene-Polyethylene. Later, the Sintez-Kauchuk Plant was transferred to the Ethylene-Polyethylene Plant, and by the Decree of the President of the Republic of Azerbaijan dated April 2, 2010, titled “On Improvement of Management Mechanisms in Petrochemical Industry,” Azerikimiya PU was transferred to SOCAR.[100]

Kerimli et al. (2021) reported that a new era began with the establishment of SOCAR Polymer LLC in 2013, the first public–private partnership in Azerbaijan in the chemical and petrochemical industry: “The company’s polypropylene (PP) and high-density polyethylene (HDPE) production facilities are located at the Sumgait Chemical Industrial Park (SCIP) site” (socarpolymer.az). Kerimli et al. (2021) assumed that Azerbaijan’s Absheron economic region can develop clusters of SMEs to exploit existing oil and gas resources. However, obstacles exist to achieving stability in the chemical industry, the largest of which are as follows: bureaucratic barriers, difficulties in financing business activities, political sanctions that increase the costs and risks of operations, and a high tax burden encouraging the shadow economy (Kerimli et al. 2021). Nevertheless, recent developments in the chemical and petrochemical industries in Azerbaijan, as well as in the institutional, economic, and political environment, have provided new opportunities and challenges for shaping the non-oil manufacturing sector.

[100] The Azerkhimiya PU was made a part of SOCAR by a decree from the President of the Republic of Azerbaijan on April 22, 2010.

After the painful devaluation decision in 2015, the Azerbaijani government adopted a document titled "Strategic Roadmap for the National Economic Prospects of the Republic of Azerbaijan," which prioritized the chemical and petrochemical industries. In the 21st century, developing Azerbaijan's chemical industry is crucial. The post-oil boom era is characterized by increasing global economic influences and lower oil prices; thus, the country needs to develop industries outside of the oil sector that are competitive and capable of contributing to the growth of the national economy (Gamidova 2017).[101]

Various infrastructure supports were also considered for the budding chemical companies.[102] The government claimed the following:

> *Work continued on the creation of external and internal infrastructures in the Sumgait Chemical Industrial Park, office, consulting, laboratory, business start-up, training and vocational education services, and other necessary infrastructure facilities for the effective implementation of entrepreneurial activities. The implementation of the "Polymer" project by the State Oil Company of the Republic of Azerbaijan in the Park is the largest project of its kind and scale in the petrochemical industry of Azerbaijan in the last 40 years. In addition, large-diameter corrugated polyethylene pipes, steel pipes, mechanical and hydraulic equipment, and glass panels based on float technology are produced at the park (rolling in a hot bath). The country's first pesticide production plant has been put into operation.* (New Production Facilities and Prospects, Strategic Roadmap for the National Economic Prospects of the Republic of Azerbaijan 2016)

Although certain development programs have prioritized the development of the chemical industry, such as the aforementioned Strategic Roadmap and "Azerbaijan 2020: Vision for the Future," FDI in these sectors remains low or nonexistent;

---

[101] The Ministry of Agriculture, together with the Ministry of Economy, will consider providing the necessary support to the private sector in setting up fertilizer (as well as biofertilizer) plants, if necessary. One of the potential opportunities in the oil and gas sector is the construction of fertilizer plants, and the measures taken in the agricultural sector will be coordinated according to such opportunities. The work to be done in this area is taken into account in the 3rd strategic goal of the "Strategic Roadmap for the Development of the Oil and Gas Industry (including chemical products) of the Republic of Azerbaijan." Measure 4.5.5: Promoting local fertilizer production, Strategic Road Map for the Republic of Azerbaijan's National Economic Prospects 2016).

[102] SME entities representing different sectors can make better use of the opportunities created by special zones. For example, entities operating in the chemical industry may participate in the joint management of costly sewerage and wastewater infrastructure (7.1.6. Priority 1.6. Special industrial zones and on the creation of clusters for SMEs, Strategic Road Map for the National Economic Prospects of the Republic of Azerbaijan 2016).

moreover, energy efficiency is low, production capacity is small, and export participation could be better (Abbasov–Aliyev 2018). The production of household chemicals (e.g., detergents and drain cleaners) is also weak in Azerbaijan's economy. This limits the development of subsectors of light industry as they are deprived of cheap inputs (Abbasov–Aliyev 2018). The expansion of oil refining is expected to produce raw materials, which can be used to increase the capacity of large technological units in the country's chemical and petrochemical enterprises (Gamidova 2017). However, some subsectors of the chemical industry, such as chlorine, hydrochloric acid, caustic soda, liquid soda, sulfuric acid, and isopropyl alcohol, have either declined sharply or simply ceased operations (SSCRA 2020).

Overall, despite the chemical industry's enormous economic potential and other benefits that it offers many countries, it is a controversial manufacturing sector because of the high risks that it poses (Malich et al. 1998, as referenced in Dakkoune et al. 2018). Environmental pollution and safety problems are typical negative externalities of this industry (Chen–Reniers 2020). For example, its facilities are usually located in densely populated areas and operate with hazardous materials (Reneirs et al. 2006, as referenced in Dakkoune et al. 2018). Thus, severe industrial accidents could seriously damage the surrounding environment and urban areas, which the government must consider in industrial planning (Gomez et al. 2008). Even though the chemical industry has played a key role in the development of manufacturing, countries are now using new economic models, such as the circular economy and Industry 4.0, to achieve sustainable levels of growth and development (Cucciniello–Cespi 2018; Cortés Serrano et al. 2018; Keijer et al. 2019).

Table 3.1. summarizes the key literature examples and their messages in a tabular way.

Table 3.1: A quick overview of the key literature examples.

Author(s)	**Main findings, factors and messages**
Natural resource curse (NRC)	
Auty (1993; 2001); Sachs and Warner (1997; 1998; 1999; 2001)	Slower growth of resource-poor countries compared to resource-rich countries.
Gylfason and Zoega (2006)	The NRC's general framework: macroeconomic and social institutions.
Ross (2013)	A strong emphasis on oil as a reason for NRC
Sala-i-Martin and Subramanian (2003), Murshed (2004), and Isham et al. (2005)	Agreed with Ross (2013) that point-source natural resources lead to NRC.
Isham et al. (2005), Mehlum et al.	Strong emphasis on non-democracies where natural resources

(2006), and Wick and Bulte (2009)	become a "curse" rather than a "blessing."
Auty and Warhurst (1993); Mapon and Tsasa (2019); (Brunnschweiler 2008)	These authors critiqued the NRC phenomenon by simply pointing to the role of institutions and governance and highlighting some positive effects of natural resources on labor and institutions.

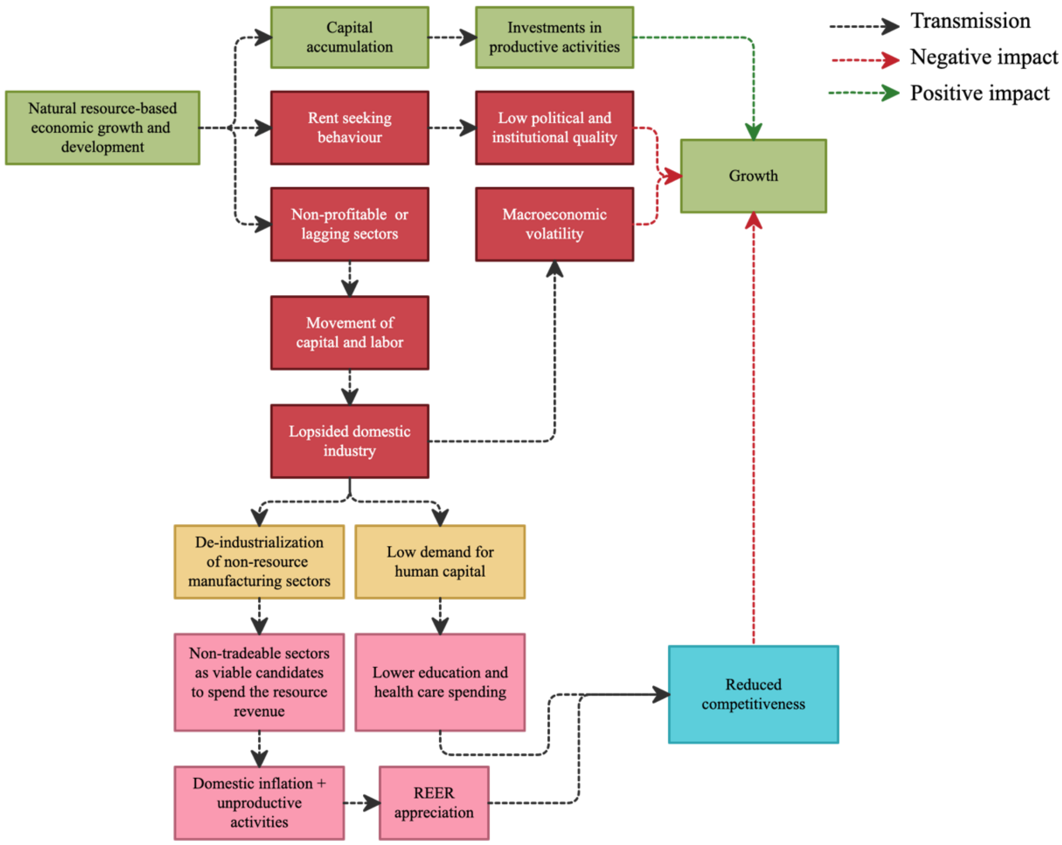
Dutch disease (DD)	
Corden and Neary (1982) and Corden (1984)	The first original theory of DD.
Gahramanov and Fan (2002)	The first empirical study of DD on the example of Azerbaijani economy. The authors rejected DD due to lack of monetary signs of the theory.
Hasanov (2013)	The first comprehensive work demonstrating the presence of DD in the Azerbaijani economy due to the strong co-integration relationship between oil prices and GDP and inflationary pressures from government spending.
Niftiyev (2021) and Majidli (2022)	Comprehensive study of the DD phenomenon in Azerbaijan, indicating the presence of resource movement and the spending effects of the theory.
Bayraç and Çemrek (2019)	These works concluded that there are no DD signs or effects in Azerbaijan.
De-industrialization	
Clark (1957) and Kaldor (1966)	The authors were the first to use the term "de-industrialization" in their articles.
Kandžija et al. (2017); Rowthorn and Ramaswamy (1997)	The main internal determinants include the following: GDP per capita, economic expansion or recession, structural changes, labor productivity growth, investment in manufacturing, and declining demand for manufactured goods-or a shift in consumer spending to services.
Kucera (2003); Bogliaccini (2013); Saeger (1997); Alderson (1999); and Van Neuss (2018)	External causes of de-industrialization: international trade and globalization.
Rodrik (2016)	Referred to as "premature de-industrialization."
Malik (2010); Gurbanov (2013) and Hasanov (2013)	Initial reflections on the phenomenon of de-industrialization in the Azerbaijani economy.
Niftiyev (2020a); Azizov (2021) and Niftiyev (2022)	Targeted study and identification of the visible patterns of de-industrialization outside the oil sector in Azerbaijan.
Yun (2018)	A panel study identifying Azerbaijan as a prominent country that de-industrialized while the REER soared.

Source: The author's own construction based on the literature review.

3.6. Theoretical framework of this dissertation

Based on the literature review, Figure 3.3 represents the theoretical framework of this dissertation. In order to address the NRC-triggered DD-led de-industrialization process in the Azerbaijani economy, the chosen theoretical framework should clearly describe the complex interactions between the key aspects of both theories. Figure 3.3 shows the key fundamentals and outcomes of resource-based economic growth and development by integrating the key NRC and DD aspects relevant to economic growth in an oil-rich country. The discussion in the subsequent paragraphs provides detailed theoretical explanations of how DD relates to the de-industrialization of lagging sectors and how it affects economic growth.

Figure 3.3: Theoretical framework of the dissertation based on NRC and DD theories.



Source: Author's own construction based on the literature review.

While natural resources could have a positive impact on growth if there is capital accumulation and adequate investment in productive activities, the key observation is that windfall revenues lead to a "rentier state" effect, where easy access to resource revenues discourages the government from collecting non-resource taxes. This also results in the government being less responsive to citizens' demands (Mlambo 2022) and failing to manage oil revenues, leading to corruption and a poor institutional environment (Kurečić–Seba 2016, as cited in Mlambo 2022). Low political and institutional quality, in turn, has a direct negative impact on economic growth, as recent studies by Natkhov and Polishchuk (2019), Bosco and Poggi (2020), Olabisi (2020), Butkiewicz and Yanikkaya (2010), Ullah (2020), and Oyinlola et al. (2020) show. In other words, according to the above studies, low political, institutional, and governance quality hinders SMEs' access to financial capital, increases income inequality, fails to contribute to poverty reduction, and fails to accumulate adequate human capital that could provide value-added processed products to resource-rich countries. Indeed, the deleterious effects of weak institutions and poor governance are still evident in many oil-rich countries (Ajida–Soyemi 2022; Aziz 2022; Kansheba–Marobhe 2022). As indicated in the conceptual framework in Chapter 1, low social trust in politicians could lead to sufficient leeway for a few rent-seeking groups to benefit from high oil revenues in Azerbaijan.

The next more complicated and DD-oriented part of the theoretical framework describes how natural resource-based growth makes certain sectors unprofitable and leads to crowding-out effects when labor and capital begin to move between sectors of the economy. In short, if capital and labor are mobile in the three-sector model of the economy, a sector that experiences a boom will attract labor and capital, making some sectors unprofitable and unproductive. This leads to a lopsided economic structure in which only one good is normally produced and exported. In this case, the non-tradeable sectors become the next best sector for labor and investment. However, governments of resource-rich countries tend to invest in unproductive activities that do not increase the productive capacity of the economy, so the absorptive capacity of the economy is low. Moreover, this leads to inflation and appreciation of the REER, which reduces competitiveness and thus hampers growth.

Figure 3.3 shows that a lopsided economy has an indirect negative impact on growth as the economy requires less human capital and macroeconomic instability increases as commodity price fluctuations lead to lower national incomes due to low economic complexity. Domestic inflation, usually due to imprudent procyclical fiscal policies in commodity-rich countries, leads to higher costs of domestic production for tradeable sectors. As a result, less human capital is demanded by the economy. If this government and market failure is not corrected, commodity revenues will only be invested in non-tradable sectors. In this scenario, the price level of non-tradeables will further raise the general domestic price level, leading to an appreciation of the REER. Thus, due to the appreciation of the REER and macroeconomic volatility, the lopsided economic structure has a negative impact on long-term growth.

Although NRC and DD theories explain the main expectations of resource-based economic growth and the directions of its effects, individual-level aspects (e.g., de-industrialization of subsectors) have not yet been studied in depth. It is difficult to say whether system-level events can be generalized to individual-level cases. This gap suggests taking a case study approach after aggregate-level analysis and operationalizing new variables to model more accurate reflections of NRC or DD phenomena. Accordingly, this dissertation uses newly constructed variables such as EDI, MPC, the oil boom, and economic shocks (dummy variables) to answer this theoretical question. The rationale for using these variables is that traditional variables such as oil prices and oil industry output may not be sufficient to capture the impact of the oil sector on the non-oil sectors of the economy.

3.6. The topicality of NRC and DD for the time being

From recent debates and publications, we can see that NRC and DD are still among the most important challenges facing resource-rich countries and their regions or provinces. Certainly, much has changed since the early 1980s and 1900s, when scholars first defined and modeled the key drivers of NRC and DD (Auty 1993). While 30–40 years ago the focus was on long-term sustainable growth and development without heavy reliance on international commodity markets, today there are additional factors. For example, green growth, the Sustainable Development Goals (SDGs), and institutions are the main motivators for continuing NRC and DD studies because economic growth and the creation of tangible wealth is a gradual and evolutionary process rather than an immediate one. For example, previous and current studies on the role of natural resources have discussed that resource rents should serve the prosperity of society, but this has been slow or nonexistent. A few publications are cited below to demonstrate the continuing relevance of these theories to resource-rich economies.

In the case of single-country studies of large economies, Lee–He (2022) showed that resource-rich Chinese provinces were unable to achieve high green total factor productivity, while resource-poor provinces were able to achieve higher levels. In addition, Lee–He (2022) also sheds light on the importance of the role of institutions, a much-debated topic in the case of resource-rich economies. For example, market-oriented institutions have helped turn the "resource curse" into a "resource blessing" by increasing the allocative efficiency of markets and firms in China. Yu et al. (2022) reached similar conclusions to Lee–He (2022) in the case of the Chinese economy, but also emphasized the harmful effects of a special situation called resource dependence. In other words, the resource wealth of certain regions did not hinder the economic growth or productivity of those regions, but when a region becomes dependent on resource rents, there is a clear sign of NRC. The approach used by Yu et al. (2022) was a generalized weighted least squares support vector panel regression model for the data sample between 2009 and 2018.

In panel data studies, NRC continues to dominate the literature when resource-rich poor countries and developing countries are analyzed in terms of their key economic indices. For example, Ajide (2022) examined sub-Saharan African countries between 1995 and 2018 and concluded that natural resource dependence or overdependence has hindered the economic complexity of African countries. In other words, the parallel growth of non-commodity-producing sectors vis-à-vis extractive industries has not been sustained by the government, indicating the practice of rent mismanagement. The recent study by Inuwa et al. (2022a) reached similar conclusions: the ten most commodity-rich African countries suffer from the negative effects of commodity dependence, particularly in terms of institutional quality and financial development. Other panel data-based studies by Inuwa et al. (2022b) also found a negative relationship between natural resources and their impact on growth in the GCC region and emphasized the crucial role of institutions in the whole process. In the MENA region, the quality of institutions also remains low (e.g., widespread corruption), while oil revenues are a large part of the economy (Chebab et al. 2022). As a result, resource-rich regions continue to dominate the literature in the absence of conclusive attempts to manage resource rents in a more inclusive and sustainable manner.

It seems that the importance of the NRC theory continues to be supported by studies from a single country. Dell'Anno and Maddah (2022) studied rent-seeking behavior and resource rents in the case of Iran and claimed that institutions play a crucial role in transforming resource rents into long-term sustainable development when a certain threshold is not exceeded in terms of resource dependence. The other example comes from Kazakhstan, where DD has been a long-debated academic topic. Kelesbayev et al. (2022) found that oil prices largely determine the main dynamics of the REER and CPI. There is also clear DD evidence in the Kuwaiti economy, as Azom (2022) found that the non-oil manufacturing sector declined while the non-tradeable sector increased due to positive oil productivity shocks based on the dynamic stochastic general equilibrium model. As a result, key macroeconomic indicators are highly correlated with economic activity related to the oil sector (vulnerability to commodity price shocks).

Other empirical studies reached a different conclusion: Gombodorj and Pető (2022) found no negative impact of mining on agriculture in Mongolia, but commodity wealth does not contribute to poverty reduction either. Similarly, in the case of Algeria, Maachi and Benloulou (2022) found no important empirical evidence for the DD signs.

Maachi and Benloulou (2022) argued that the exchange rate channel was well controlled, and oil prices in Algeria did not lead to an appreciation of the national currency between 1990 and 2016.

We observe more sophisticated methodological tests and up-to-date data sets that improve our understanding in the case of single-country and panel data, as presented in some of the publications cited above. In all studies, the institutional and human capital channels showed statistically significant results in relation to the NRC doctrine. Considering the current data samples and methodologies, all these studies show the timeliness of NRC and DD, as there is still no conclusive evidence that resource-rich countries have been able to transform their resource wealth into economic prosperity. While some countries, such as Chile, Norway, and Malaysia, have been able to diversify their economies by redirecting resource rents to productive sectors of their economies, the vast majority of resource-rich countries remain dependent on resource rents (Lashitew et al. 2021). This dependence is based on public spending by domestic actors and less transparent policies (Brollo et al. 2013). The fact that so few countries have been able to break free of NRC and DD reflects the complex nature of resource-based economic growth and development and the quality of the choices their economies have had to make.

CHAPTER 4

DATA AND METHODOLOGY

In this section, it is possible to find all the data and methodological explanations of the empirical analysis of the dissertation. Because the study included three major empirical phases—the NRC analysis, the DD analysis, and the chemical industry analysis—the methodological aspects of each phase are discussed in separate subsections.

4.1. Data and methodology of the analysis of NRC in the Azerbaijan's economy

To test the validity of the NRC thesis in Azerbaijan, the present study collected indicators related to institutions, governance, and human capital (i.e., health and education spending) to examine whether any statistically significant associations could be found with oil-related variables. In addition, a figure analysis of the main political, institutional, and governance indicators was conducted in the initial stage of the empirical analysis to allow comparisons between the oil boom and post-boom periods. Lastly, a bottom-up perspective was applied through the evaluation of qualitative data from World Values Survey (WVS). The selected survey questions were related to the importance of politics, trust in politicians and the government, and Azerbaijani citizens' propensity to take political action, reflecting the changing societal perceptions of the political government between 1994 and 2020.

4.1.1. Dependent variables

Table 4.1 lists the dependent variables that were used in the principal component analysis (PCA) and regression analysis. In the main, these are the index variables that were used to measure institutional quality in Azerbaijan. The total government expenditure on education (TGEE) and out-of-pocket expenditure on health care services (OP_EXP) represent the percentage shares of GDP and current health care expenditure, respectively.

The political and institutional channel of the resource curse in Azerbaijan was traced through the following variables: political stability and absence of violence/terrorism (POL_ST; hereinafter "the political stability index" or "political stability"), the rule of law (RULE_O_LAW), the voice and accountability index (VO_AND_ACC), and latent human rights protection scores (H_RIGHTS; hereinafter "human rights scores"). The first four variables were obtained from the Worldwide Governance Indicators (WGI) provided by the World Bank, while the last variable was taken from the data set of Schnakenberg and Fariss (2014), referred to by Fariss (2019) as "Latent Human Rights Protection Scores."

Table 4.1: Dependent variables used in the study.

Variable name	**Abbreviation**	**Measurement**	**Source**	**Resource curse channel**
Political stability and absence of violence	POL_ST	Index value: −2.5 (weak) to 2.5 (strong)	World Bank – Worldwide Governance Indicators (Schnakenberg & Fariss, 2014; Fariss, 2019)	Political and institutional channel
Rule of law	RULE_O_LAW			
Voice and accountability	VO_AND_ACC			
Human rights scores	H_RIGHTS	−3.8 (weak) to 5.4 (strong)		
Government effectiveness	GOV_EFFEC	Index value: −2.5 (weak) to 2.5 (Strong)	World Bank (Worldwide Governance Indicators)	Capacity to manage oil revenue channel
Regulatory quality	REG_QUAL			
Government integrity	GOV_INT	Scale from 0 to 100, where 100 indicates very little corruption		
Total government expenditures on education	TGEE	% of GDP	World Bank	Education and human capital channel
Out-of-pocket expenditures on health services	OP_EXP	% of current health expenditure		

Furthermore, POL_ST measured perceptions of the likelihood of political instability or politically motivated violence, including terrorism. The control of corruption captured perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, and state "capture" by elites and private interests. RULE_O_LAW represented perceptions of the extent to which agents have confidence in and abide by the rules of society, particularly the quality of contract enforcement, property rights, and the police and courts, as well as the likelihood of crime and violence. VO_AND_ACC captured perceptions of the extent to which citizens can participate in selecting their government as well as freedom of expression, association, and the press. Finally, H_RIGHTS measured the quality of the overall environment for human rights in a country.

All of the variables related to the political and institutional channel, excluding human rights scores, ranged between −2.5 and +2.5 (the higher the better). Human rights scores ranged from −3.8 (minimum) to 5.4 (maximum). The examined period was from 1996 to 2019.

4.1.2. Independent variables

Table 4.2 lists the explanatory variables applied in this study's regression analysis. Similar to the dependent variables, the time period covered was 1996 to 2019. Of the independent variables, only the extractives dependency index (EDI) was calculated according to Hailu and Kipgen's (2017) methodology. The formula and accompanying explanations are as follows:

$$EDI = \sqrt{[EIX_t \times (1 - HTM_t)] * [Rev_t \times (1 - NIPC_t)] * [EVA_t \times (1 - MVA_t)}\ , \quad (1)$$

where

EDI is the extractives dependence index for a country at time *t*;
EIX is the revenue from the extractive industry, expressed as a share of total export revenue;
HTM is the export revenue from high-skill and technology-intensive manufacturing as a share of global HTM exported in year *t*;
Rev is the share of revenue from the extractive industry in total fiscal revenue;
NIPC is non-resource income, including tax revenue, profits, and capital gains as a percentage of GDP;
EVA is the share of the extractives industries' value-added in GDP; and
MVA is the countrywide non-resource manufacturing potential, as measured by per capita manufacturing value-added.

Table 4.2: Explanatory/independent variables used in the study.

Variable name	Abbreviation	Levels of measurement and description	Source
Extractive dependency index (EDI)	EDI	Index value	Calculation based on Hailu–Kipgen (2017)
Oil rents	OIL_RENTS	% of GDP	World Bank
Oil exports/GDP	OIL_ EXP	Share of oil exports in GDP, %	
Oil foreign direct investment (FDI)	OIL_FDI	Annual FDI to oil sector	Mehtiyev (2019)
SOFAZ's share of the state budget	SOFAZ's_SH	% of total state budget	Annual reports from SOFAZ
Economic shocks	ECON_SHOCK	Dummy variable where 1 = 2008–2009 and 1 = 2014–2015	Based on economic downturn years provided by the

EDI is a multidimensional variable that captured the share of natural resource and non-natural resource sectors in the national economy. Oil rents (OIL_RENTS) represented the difference between the value of crude oil production in international prices and the total cost of production, while the oil exports to GDP ratio (OIL_ EXP/GDP) represented the role of exports in the overall economy in Azerbaijan. FDI in the oil industry (OIL_FDI) was another potential channel for booming sectors to influence the variables of interest. SOFAZ's share of the state budget (SOFAZ's_SH) measured the state budget's performance in relation to the oil revenue transfers from SOFAZ. Lastly, economic shocks (ECON_SHOCK) was a dummy variable for the global financial crisis in 2008 and 2009 and sharp commodity price downturns in 2014 and 2015.

All additional information (e.g., descriptive statistics, normality tests) on the data analyzed in Chapter 5 related to NRC can be found in the Appendix section (see Table A4.1 and A4.2).

4.1.3. Empirical strategy

Considering the wide range of the collected data set, the main empirical stage started with PCA. PCA is beneficial when the data set is large and several variables need to be examined (Bro–Smilde 2014). Jolliffe's (1990) early study on PCA stressed that if the correlation between variables is strong, it may be decreased to discover "a true dimension" of the data set that would deliver the same information with the least information loss. This reduction yields "components," which help one to identify patterns across various data series (Ringnér 2008). Ringnér (2008) also emphasized the independence of components rather than them being uncorrelated. If the original variable quantity *a* can be reduced to *b* using newly constructed index variables or components, a large amount of information can be analyzed using a relatively simple technique. PCA is often used as a pre-analysis of variables of interest and also as an analytical bridge for further investigation.

Here, PCA provided the main components for analyzing institutional quality and its relation to the oil sector. Varimax rotation was used in the PCA to maximize the variance of the factor loadings (Dien 2010). The main components were then saved as individual time series and regressed against each other using the dynamic ordinary least squares (DOLS) method. The model specification is as follows:

$$Institutional\_quality_t = \beta_0 + \beta_1 Oil\_factor_t + \sum_{i=-m}^{i=m} \Delta\beta_1 Oil\_factor_t + \in_t \text{ , } (2)$$

where institutional_quality is the first component of PCA at time t; Oil_factor is the second component of PCA at time t; and ∈ is the error terms. Furthermore, Oil_factor was added along with lags, allowing to find the best way to build the model and to test how stable the results were.

This study also used the ordinary least squares (OLS) technique to test the impact of individual oil-related variables on the selected human capital variables. Three models related to this are presented as follows:

$$OP\_Expenses_t = \beta_0 + \beta_1 Oil\ Rents_t + \beta_2 EDI_t + \beta_3 Oil\ Exports_t + \\ + \beta_4 Economic\ Shocks_t + \in_t \quad (3)$$

$$TGEE_t = \beta_0 + \beta_1 Oil\ Rents_t + \beta_2 EDI_t + \beta_3 Oil\ Exports_t + \\ + \beta_4 Economic\ Shocks_t + \in_t \quad (4)$$

$$Human\ Rights_t = \beta_0 + \beta_1 EDI_t + \beta_2 Mining\ industry_t + \beta_3 SOFAZ'share_t + \in_t \text{ (5)}$$

In the above-listed models, *OP_Expenses* denotes the out-of-pocket expenses on health care; *TGEE* is the total government expenditure on education; *Human Rights* is the human rights scores at time t; and β_0 is the intercept in all models. Then, *Oil rents, EDI*, *Oil Exports*, *Economic Shocks*, *Mining Industry*, and *SOFAZ's share* are the explanatory variables at time t. Lastly, $\in_t$ is the error terms at time t.

Lastly, large-scale cross-national WVS questions were evaluated to apply a bottom-up perspective on Azerbaijan's institutional quality between 1994 and 2020. More specifically, the survey results were from the WVS waves between 1994 and 1998, 2005 and 2009, 2010 and 2014, and 2017 and 2020 when the respondents from Azerbaijan participated in the surveys. Individuals from dozens of nations worldwide self-report their values, attitudes, and beliefs regularly to the WVS (Barrios 2015). People are asked how they feel about their lives, including how happy they think they are. They are also asked questions about politics and society in general, including what they think of competition. The surveys also ask each person about their gender, income, and religious beliefs, among other things (Barros 2015). Thus, the WVS was a valuable source for assessing the social perceptions and cohesion in Azerbaijan and how they have changed over economic development stages (e.g., recession, transition, oil boom, and post-boom).

4.2. Data and methodology of the analysis of DD in the Azerbaijan's economy

This section presents the data and methodology of the study. First, Section 4.2.1 provides an overview of the data sources, sample size, variables and their measures, and sources. Then, Section 4.2.2 discusses the empirical strategies used to test the DD hypothesis for Azerbaijan.

4.2.1. Data and variables of interest

The main data sources for this study were the State Statistical Committee of the Republic of Azerbaijan (SSCRA) and the World Bank. The collected data were aggregated (grouped) into the following three sectors, as in the literature review section: S_B – booming sectors that comprise the extraction of crude oil and natural gas as well as petroleum manufacturing; S_L – lagging sectors that comprise non-oil manufacturing, the production of utilities, and agriculture; and S_{NT} – non-tradeable/tertiary sectors that are a combination of service sectors, such as construction, transportation, and trade.

Table 4.3 contains the names and descriptions of the explanatory variables, units of measurement, sources, and the section in which they are used. Descriptive statistics, outlier years, missing values, and the Shapiro–Wilk normality test for the explanatory and dependent variables presented in this chapter can be found in the Appendix (see Table A4.3 and A4.4).

The first subsection of DD chapter (5.2.1) contains monthly oil prices (i.e., the average spot price of Brent). A VAR model was constructed to test whether international oil prices lead to an appreciation of the Azerbaijani REER. The second subsection (5.2.2) reports how the REER, nominal effective exchange rate (NEER), oil prices, oil rents, and EDI affected the three-sector model of Azerbaijan's economy between 1990 and 2019. Effective exchange rates were included in two forms, namely nominal (NEER_66) and real (REER_66) terms based on 66 trading partners.

Separating the exchange rates into real and nominal allowed the exchange rate to be tracked with and without inflation effects. The third and fourth subsections (5.2.3 and 5.2.4) present results on the resource movement and spending effects of DD, respectively. Compared with other studies (e.g., Hasanov 2013), this study analyzed two effects of DD theory separately, which allowed for an enhanced conceptualization of DD in Azerbaijan.

Table 4.3: Independent (explanatory) variables used in the analysis.

Section	Variable name	Description	Measurement unit	Source
5.2.1.	OIL_PRICES	Crude oil, average spot price of Brent, Dubai and West Texas Intermediate, equally weighted	USD per barrel, monthly	IndexMundi
	REER_66	Real effective exchange rate based on 66 trading partners	In percent, 2007 = 100%, annual	Bruegel data sets, Real effective exchange rates for 178 countries: A new database
	NEER_66	Nominal effective exchange rate based on 66 trading partners		
5.2.2.	OIL_PRICES	Europe Brent Spot Price FOB, Brent trademark	USD per barrel, annual	U.S. Energy Information Administration
	OIL_RENTS	Oil rents of Azerbaijan's economy	% share of GDP, annual	The World Bank
	EDI	Extractives dependence index	Index value, annual	Calculation based on Hailu–Kipgen (2017)
	OIL_BOOM	Oil boom period	2005–2014=1, annual	Dummy variable
5.2.3.	OUTPUT_SB_GR	Output growth rate of booming sectors	In %, year-over-year	SSCRA
	OUTPUT_SL_GR	Output growth rate of lagging sectors		
	OUTPUT_SNT_GR	Output growth rate of non-tradeable sectors		
	INC_AZN	Population income in the Azerbaijani manat	In AZN, annual	
	INC_USD	Population income in USD	In USD, annual	
	REER	Real effective exchange rate	Index value, quarterly	Bruegel data sets
	Oil_P	Oil prices of the BRENT trademark	In USD, quarterly	International Energy Agency
	MIN_EMP	Mining employment	In thousands of persons, quarterly	SSCRA
	SERV_EMP	Services employment		
5.2.4.	MPC	Marginal propensity to consume	Calculated values	Own calculation based on SSCRA data

OUTPUT_SNT	Output of non-tradeable sectors	In AZN, annual	SSCRA
INC_POP_AZN	Population income in the Azerbaijani manat		
INC_POP_USD	Population income in USD	In USD, annual	
GOV_SPEND_USD	Government spending	In USD, annual	
GOV_SPEND_SHARE_GDP	Government spending as a share of GDP	In %, monthly	World Bank
ST_BUD_EXP	Expenditure of the state budget	In millions AZN, monthly	CBAR

Table 4.4 lists the dependent variables of the study. In the first subsection (5.2.1), only one dependent variable is used, namely the REER (REER_66). In the second subsection (5.2.2), 10 dependent variables are used to outline the sectoral distribution of the influence of REER, NEER, oil prices, oil rents, EDI, and the oil boom period. Only two of them, namely exports of booming (SB_EXP_SH) and lagging sectors (SL_EXP_SH), are experimental in nature, since DD studies do not usually examine how the sectoral manifestations of DD show up in exports.

Table 4.4: Dependent variables used in the analysis.

Section	Variable name	Description	Measurement unit	Source
5.2.1.	REER_66	Real effective exchange rate based on 66 trading partners	In %, quarterly	Bruegel data sets
5.2.2.	SB_OUT_SH	Share of booming sectors in industrial production	% of overall industrial production, annual	State Statistical Committee of the Republic of Azerbaijan (SSCRA)
	SM_OUT_SH	Share of manufacturing/lagging sectors in industrial production		
	SM_VA_SH	Manufacturing value-added	% of GDP, annual	World Bank
	SA_VA_SH	Agriculture, forestry, and fishery value-added		
	SNT_VA_SH	Services value-added		
	SB_EMP_SH	Share of booming sectors in overall employment	% of total employment, annual	SSCRA, World Bank
	SL_EMP_SH	Share of lagging sectors in overall employment		
	SNT_EMP_SH	Share of non-tradeable sectors in overall employment		
	SB_EXP_SH	Share of booming sectors in total exports	% of total exports, annual	
	SL_EXP_SH	Share of lagging sectors in total exports		
5.2.3	OUT_SB_GR	Output growth rate of booming sectors	In year-over-year %, annual	SSCRA

	OUT_SL_GR	Output growth rate of lagging sectors		
	OUT_SNT_GR	Output growth rate of non-tradeable sectors		
	EMP_SB_GR	Employment growth rate of booming sectors		
	EMP_SL_GR	Employment growth rate of booming sectors		
	EMP_SNT_GR	Employment growth rate of booming sectors		
	MAN_EMP	Manufacturing employment	Quarterly, thousand people	
5.2.4	CPI_GR	Consumer price index growth rate		
	REER_GR	Growth of the real effective exchange rate	In %, annual	Central Bank of the Republic of Azerbaijan (CBAR)
	NEER_GR	Growth of the nominal effective exchange rate		
	CPI_ANAVE	Consumer price index	Annualized average, in %, monthly	

The export and import data provided by SSCRA are limited to the period 1996–2019. Missing values for the period 1990–1995 were taken from World Bank statistical handbooks (1993, 1996) and inserted into the data set. There were also missing values for the EDI (for 1990–1993) because data for individual components of the index were not available for these years. Therefore, the missing values were filled using the Trend function of the online Google Sheets application using the least squares method. Since OLS and FMOLS are sensitive to outliers, the outlier values were examined using boxplots and then Winsorized using the "Trimming and Winsorizing" add-in of Eviews version 11.

Section 5.2.3 analyzes how the growth rate of output and employment of one sector affects the output or employment of another sector, for which the OLS technique was used based on annual data. The initial linear models revealed that manufacturing employment may be negatively affected by the DD-related variables. For this reason, quarterly manufacturing employment between 2000 and 2020 was analyzed in the context of REER, oil prices, services, and mining employment (see Subsection 5.2.3 for more details).

Similar to the estimation of the resource movement effect, the spending effect was also modeled using the OLS technique. Subsequently, a BVAR model was constructed for a more targeted approach, which involved analyzing the short-term relationship between CPI and state budget spending using monthly data.

4.2.2. Empirical strategy

This section summarizes the main empirical strategies that were used to obtain the results presented in each subsection of Section 5.2.

4.2.2.1. Empirical strategy for REER appreciation

The methodology used to obtain the results in Section 5.2.1 was the standard unrestricted VAR model. This was used to identify the responses of Azerbaijan's REER to oil price shocks. The empirical form of the VAR analysis is defined as follows:

$$\Delta REER_t = \beta_{10} + \beta_{11}\Delta OILP_t + \cdots + \beta_{1j}\Delta OILP_{t-n} + \epsilon_{1t} \text{ ,} \quad (6)$$

where $\Delta REER_t$ is the REER at time t; $\Delta OILP_t$ denotes oil prices at time t; and ϵ_{1t} is the error term. The expected relationship from the VAR model was positive responses of REER to oil price shocks.

4.2.2.2. Empirical strategy for sectoral implications of REER, NEER, oil prices, and oil rents

According to the original theory by Corden and Neary (1982) and Corden (1984), testing the sectoral effects of the key variables of DD was crucial. To achieve this goal in the case of Azerbaijan's economy, the FMOLS method was applied, which is an optimal single-equation linear modeling approach (Philips–Loretan 1991). It effectively addresses problems of serial correlation and endogeneity among independent variables based on the OLS technique (Philips–Hansen 1990). Serial correlation and endogeneity usually occur due to the presence of interactions of the cointegrating process among the explanatory variables in linear models (Rahman et al. 2021). Moreover, FMOLS effectively addressed the nonstationarity of the data set by adding linear and quadratic trends as well as deterministic regressors, which allowed the quality of the modeling to be improved. Therefore, the sectoral distribution of the impacts of REER, NEER, oil prices, and oil rents in Azerbaijan was tested, and the results are presented in Section 5.2.1. The only control variable used was the exchange rate (NEER and REER). The distinction between the NEER and the REER allowed the inflation effects to be observed and whether sectoral output or employment was affected by oil-related inflationary pressures to be determined. The model used in Section 5.2.2 was as follows:

$$S_{x,t} = \beta_0 + \beta_1 EDI_t + \beta_2(REER_t; NEER_t) + \beta_3 OIL\_BOOM_{Dummy} +$$
$$\beta_4 OIL\_PRICES_t + + \beta_5 OIL\_RENTS_t + \ \beta_6\, TREND + \varepsilon_t] \text{ ,} \quad (7)$$

where β_0 is the intercept, $S_{x,t}$ is the given sector (i.e., booming, lagging [agriculture, manufacturing, or combined], or non-tradeable) at time t, EDI_t is the EDI at time t, $REER_t$ is the REER at time t, $NEER_t$ is the NEER at time t, OIL_BOOM is a dummy variable, OIL_PRICES denotes oil prices at time t, OIL_RENTS denotes oil rents as the share of GDP at time t, and TREND is the linear trend of the models. REER and NEER were the control variables used in the analysis.

4.2.2.3. Empirical strategy for the resource movement effect

The empirical strategy employed to obtain the results in Section 5.2.3 was modeled after Mironov and Petronovich's (2015) study on the Russian economy. They applied the OLS estimation technique to analyze the three-sector model of DD in the Russian case.

OLS estimation is one of the most popular statistical methods in the social sciences (Hutcheson–Sofroniou 1999); furthermore, it remains one of the most widely used multivariate techniques for quantifying hypothesized relationships among variables of interest (Krueger–Lewis–Beck 2008). The empirical model for the resource movement effect of DD for Azerbaijan is as follows:

$$Output\ GR_t/Employment\ GR_t = \beta_0 + \beta_1 S_B GR_t + \beta_2 S_L\ GR_t + \beta_3 S_{NT}\ GR_t + \\ + \beta_4(Popuation\ income\ in\ USD_t; Population\ income\ in\ AZN_t) + \varepsilon_t\ , \tag{8}$$

where *Output GR* and *Employment GR* are the output and employment year-over-year growth rates of a given sector (S_B, S_L or S_{NT}) at time t; β_0 is the intercept; $\beta_1, \beta_2, \beta_3$, and β_4 are the coefficients of the explanatory variables; and $S_B GR, S_L GR$, and $S_{NT} GR$ are the year-over-year growth rates of the sectors at time t. Furthermore, $Population\ income\ in\ USD$ and $Population\ income\ in\ AZN$ are the population income in two currencies, namely USD and AZN, which were the control variables, and ε_t is the error term of the equation at time t. Notably, the abbreviation "GR" means growth rate among the listed formulas; moreover, "/" does not indicate the division sign but rather multiple dependent variables in the same formula.

To ensure a more focused approach to the resource movement effect and reveal direct or indirect de-industrialization processes in manufacturing employment in Azerbaijan's economy, the following unrestricted standard VAR model was applied for the time period 2001Q1–2020Q4:

$$Z_t = \alpha + \sum_{j=1}^{p} \pi_j Z_{t-j} + \sum_{j=0}^{m} \varphi_t X_{t-j} + \delta_t + \epsilon_t \ , \tag{9}$$

where Z_t is the vector of endogenous variables, π_j is a matrix of k autoregressive coefficients at lag i, X_t is a vector of q exogenous variables, φ_t is a matrix of q exogenous variable coefficients, and ϵ_t is the error term in the macro-econometric technique. As in Koitsiwe and Adachi's (2015) paper, the error term was assumed to have no serial correlation and covariance matrix.

This econometric technique was developed following a thorough analysis of the work of Koitsiwe and Adachi (2015; a DD study on Australia). Equation (4) can also be expressed as follows:

$$\Delta MANEMP_t = \beta_{10} + \beta_{11}\Delta OILP_t + \cdots + \beta_{1j}\Delta OILP_{t-n} + \beta_{12}\Delta REER_t + \cdots$$
$$+ \beta_{1j}\Delta REER_{t-n} + \beta_{13}\Delta MINEMP_t + \cdots + \beta_{1j}\Delta MINEMP_{t-n} + + \beta_{14}\Delta SERVEMP_t +$$
$$+ \cdots \beta_{1j}\Delta SERVEMP_{t-n} + \epsilon_{1t} \ , \tag{10}$$

where $OILP$ is the oil price, $REER$ is the real effective exchange rate, $MINEMP$ is mining employment, $SERVEMP$ denotes the services employment figure, and ϵ is the error term. The data were transformed to their first difference because the time series in their leveled form had a unit root.

4.2.2.4. Empirical strategy for spending effect

Similar to the resource movement effect of DD, this study tested the spending effect of DD through OLS. The model for this is represented by the following formula:

$$CPI\ GR_t/REER\ GR_t/NEER\ GR_t = \beta_0 + \beta_1 MPC_t + \beta_2 S_{NT_t} + + \beta_3 POP\_INC\_USD_t +$$
$$+ \beta_4 (GOV\_SPEN\_USD_t; GOV\_SPEN\_SH\_GDP_t) + \varepsilon_{\ t} \ , \tag{11}$$

where $CPI\ GR_t, REER\ GR_t,$ and $NEER\ GR_t$ are the year-over-year growth rates of the CPI, REER, and NEER; β_0 is the intercept; $\beta_1, \beta_2, \beta_3$, and β_4 are the coefficients of the explanatory variables; MPC is the marginal propensity to consume at time t; S_{NT} denotes the output of the non-tradeable sectors; POP_INC_USD is the population income in USD at time t; GOV_SPEN_USD is the government spending in USD; GOV_SPEN_SH_GDP is the percentage share of government spending in GDP; and ε_t is the error term of the equation at time t.

To ensure a more focused analysis on the spending effect, Bayesian vector autoregression (BVAR) was also applied using the following formula:

$$CPI\_ANAVE_{i,t} = \alpha_{10} + \sum_{i=1}^{n} \beta_1 ST\_BUD\_EXP_{t-i} + \epsilon_{1i,t} \ , \tag{12}$$

where *CPI_ANAVE* is the annualized average monthly consumer price index at time *t* and lag *i*, α is the coefficient, β_1 is the coefficient, *ST_BUD_EXP* is the expenditure of the state budget, and $\in_{i,t}$ is the error term at time *t* and lag *i*.

BVAR has become popular for macroeconomic estimation with data of a small sample size, relatively simple systems, and with few or multiple predictors (as cited in Petrevski et al. 2015; De Mol et al. 2008; Banbura et al. 2010; Koop–Potter 2003; Wright 2003; Stock–Watson 2005, 2006). In a BVAR model, coefficients are often treated as random values centered around a mean (Chandramowli–Lahr 2012). Most importantly, BVAR requires one to consider several prior types when estimating a model. Model parameters in BVAR are treated as stochastic variables with prior probabilities rather than constant values, unlike typical VAR models. A study demonstrated priors in BVAR models to be highly beneficial for reducing difficulties in overparameterization (shrinkage), regardless of whether forecasting or estimating (Koop–Korobilis 2010). These shrinkages imposed by the set of priors can take the form of constraints on parameters. They can also be equal to zero. According to Koop and Korobilis (2010), this has led to a significant increase in the use of Bayesian approaches because prior knowledge provides a rational and formally consistent way to introduce shrinkage.

The Normal–Wishart prior, selected for this study, is a special version of the Minnesota prior. The Normal–Wishart prior is a standard approach in macroeconomics (see Kadiyala–Karlsson 1997; Banbura et al. 2010). Moreover, it relaxes some assumptions of BVAR, which was a necessary step in estimating the spending effect of DD in Azerbaijan's economy, since the model was small and simple, rather than large and multidimensional. According to Koop and Korobilis (2010: 11), the Normal–Wishart prior "assumes that each equation has the same explanatory variables and it restricts the prior covariance of the coefficients in any two equations by making them proportional to one another."

Next, hyperparameters had to be chosen for the BVAR modeling. These are often set to values previously reported in the literature (Amir-Ahmadi et al. 2020). There are two types of priors in BVAR under the Normal–Wishart prior, namely coefficient and residual priors, and their values range from 0 to 1 (Chandramowli–Lahr 2012). Here, the AR(1) coefficient prior (Mu1) was set to 1 due to the nonstationarity of the data (Ouliaris et al. 2016: 57), while the overall tightness residual prior (Lambda1) was set to 0.5 to manage the variance of the higher-order lags of the endogenous variable (Ouliaris et al. 2016), since the maximum lags are 12 months. The result of these steps proved fruitful, as the estimate reflected the expected direction of the nexus between CPI and the state budget spending according to DD theory.

Lastly, lag selection was set to 12 based on the monthly data type, as the AIC and other lag selection tests did not yield meaningful results. Variables in the BVAR model were estimated without any transformation and were in their nonstationary form.

4.3. Data and methodology of the analysis of de-industrialization in the Azerbaijan's economy

Because both quantitative and qualitative data were used in this study, the following subsections describe the sources and strategies used to collect data (subsections 4.3.1 and 4.3.2). Subsequently, the quantitative and qualitative methods are explained in subsections 4.3.3 and 4.3.4.

4.3.1. Quantitative data

In a given country, the employment and output shares of industries in total employment and value-added are the standard measures for estimating industry dynamics (Mayer 2018). The analysis presented in this chapter was based on the natural volume of production in the chemical industry. After a descriptive review of official data, it became clear that output at current or real prices does not capture the elements of non-oil manufacturing required to understand de-industrialization.

Empirical modeling was applied to the data range of 1995–2020. Table 4.5 describes the variables and their explanation, measurement, and source. An initial figure analysis of chemical industry subsectors was performed to select the dependent variables. The selection of explanatory variables was based on DD theory and recent literature on Azerbaijan's economy. For example, Majidli and Guliyev (2020) found that oil prices played a statistically significant role in the growth of Azerbaijan's non-oil GDP from 2005 to 2019. The importance of the REER in studies of Azerbaijan's non-oil economy has been repeatedly documented (Hasanov 2010; Hasanov et al. 2017; Zulfigarov–Neuenkirch 2019). Considering the original DD theory of Corden and Neary (1982) and Corden (1984), variables such as service sector employment (SERVICES_EMP) and oil boom (OIL_BOOM) were included in the econometric models. A dummy variable (OIL_BOOM) was also included to determine what impact the oil industry's production, revenue, and export boom might have on chemical subsectors. Finally, the real labor productivity variable in the chemical industry (RLP_CHEMICAL) tested whether the de-industrialization of Azerbaijan's economy is due to productivity gains or losses or to the oil industry.

Table 4.5: Dependent and explanatory variables of the quantitative analysis.

Variable name	Explanation of the variable	Measurement	Source
Explanatory variables			
REER	Real effective exchange rate	in %; 2007 = 100%; calculated based on 170 trading partners	Bruegel
OIL_PRICE	Global crude oil prices	USD per barrel	British Petroleum – Statistical Review of World Energy
SERVICES_EMP	Employment of the service sector	in thousands of persons	State Statistical Committee of the Republic of Azerbaijan
RLP_CHEMICAL	Real labor productivity in the chemical industry	Ratio of output over employment in the chemical industry	
OIL_BOOM	Dummy variable for the oil boom period between 2005 and 2014	2006–2014 = 1, other years = 0	Author's own construction based on macroeconomic data
Dependent variables			
CAUS_SODA	Production of caustic soda	in tons	State Statistical Committee of the Republic of Azerbaijan
CHLORINE	Production of chlorine		
HYD_ACID	Production of hydrochloric acid		
IZOP_ALC	Production of isopropyl alcohol		
LIQ_SODA	Production of liquid soda		
SUL_ACID	Production of sulfuric acid	thousands of tons	

No data were missing in the data set. The only missing value—for chlorine production for 2018—was replaced by linear interpolation based on the data range of 1995–2017. The descriptive statistics for the variables of interest are presented in Table 4.6.

The descriptive statistics indicated that, among the explanatory variables, oil prices and labor productivity in the chemical industry have high volatility, as measured by the coefficient of variation. The skewness estimation results indicated that the REER and labor productivity in the chemical industry are skewed, while oil prices and employment data in the service sector have a fairly symmetrical distribution.

Table 4.6: Descriptive statistics of the variables of interest for 1995–2020.

	Min	Max	Mean	St. Dev.	Coef. Of Variation	Skewness	Kurt.
Explanatory Variables							
REER	79.00	139.56	102.59	18.56	0.18	0.66	−0.95
OIL_PRICE	12.72	111.67	54.66	31.78	0.58	0.48	−0.93
SERVICES_EMP	841.00	1418.10	1125.50	157.72	0.14	0.00	−1.00
RLP_CHEMICAL	0.03	0.31	0.09	0.06	0.70	1.83	3.91
Dependent variables							
CAUS_SODA	0.00	7647.80	1263.92	2190.42	1.73	1.56	1.45
CHLORINE	0.00	17035.00	4661.31	4879.59	1.05	0.92	−0.03
HYD_ACID	0.00	8.10	3.81	2.91	0.76	−0.10	−1.53
IZOP_ALC	0.00	24159.20	12248.39	6155.20	0.50	0.11	0.04
LIQ_SODA	0.00	36400.00	14575.23	12523.37	0.86	0.03	−1.45
SUL_ACID	0.00	52.50	16.41	14.66	0.89	0.57	−0.17

Notes: 1) Min, max, St. Dev., and Kurt. denote minimum, maximum, standard deviation, and kurtosis respectively; 2) coefficient of variation (Coef. Of Variation) is the ratio of standard deviation over the mean of a variable.

Noteworthily, all subsectors studied here had minimum values of 0, implying a complete collapse of production, high standard deviation, and variance. In particular, caustic soda and chlorine production varied considerably, as measured by a coefficient of variation of 1.73 and 1.05, respectively. Furthermore, the skewness and kurtosis values indicated that the distribution of the dependent variables was symmetrical, except for caustic soda production (skewness = 1.56).

4.3.2. Qualitative data

The data sources for the qualitative analysis were semistructured and structured expert interviews. In this study, the experts were people with extensive knowledge or skills in a particular area based on their research, experience, or professional background. In a broader sense, an expert is someone who is an authority in their field—in this case, the field was the chemical industry and its economics. A total of 16 expert interviews were conducted in February and March 2022. The experts interviewed included 10 industry specialists and six economists. The interview process was in accordance with the Charter of Fundamental Rights of the European Union and the European Code of Conduct for Research Integrity. The industry experts were selected through recommendations from universities and research centers in Azerbaijan. In addition, professional social media networks such as LinkedIn were used to select potential respondents based on their professional experience. Furthermore, the economists were selected based on their experience, publications, and other research activities related to industrial development and the chemical industry in Azerbaijan. Moreover, before each interview, the aim and scope of the research were explained to them and they were assured of the anonymity of their answers. Thus, it was possible to create a genuine atmosphere of conversation around the research topic. Moreover, all interviewees were asked for their consent to be recorded. Only one interviewee—an industry expert—declined this request. Nevertheless, structured notes were taken to record the process of data generation. These were then reviewed and a written text of the interview was reproduced for the qualitative analysis software package Quirkos. Table 4.7 presents key information about the qualitative data sources:

Table 4.7: Technical details about the interview process and interviewees: Industry experts (Nos. 1–10) and economists (Nos. 11–16).

No.	Code	Name of Institution	Experience in Years	Language of the Interview	Type of Interview	Date
1.	TG1	SOCAR Polymer	3	ENG	Video interview	12/02/2022
2.	NN7	Sangachal Garadagh Oil and Gas Terminal, Middle East Petroleum	20	AZE	Video interview	16/02/2022
3.	OA9	Sobsan LLC	7	AZE	Video interview	17/02/2022
4.	MH4	SOCAR Polymer	7.5	ENG	Video interview	19/02/2022
5.	MH1	Synthetic rubber production, SOCAR, Azerikimya PU	57	AZE	Voice call interview	26/02/2022
6.	AB6	Former soda PF	40	AZE	Voice call interview	01/03/2022
7.	RG6	Heydar Aliyev Oil Refinery	40	AZE	Voice call interview	07/03/2022
8.	IE2	Azerikimya PU	1.5	AZE	Voice call interview	09/03/2022
9.	ISH8	Azerikimya PU	35	AZE	Voice message interview	17/03/2022
10.	EA1	Former chlorine PF	15	AZE	Reproduced from the interview notes	16/03/2022
11.	GI7	London School of Economics		AZE	Video interview	28/02/2022
12.	AM3	Azerbaijan State University of Economics	32	AZE	Video interview	03/03/2022
13.	IA8	Khazar University, Eurasia Extractive Industries Knowledge Hub	20	AZE	Video interview	01/03/2022
14.	SB1	Entrepreneurship Development Foundation	27	AZE	Written interview	14/03/2022
15.	ERS8	Ruhr-Universität Bochum	15	ENG	Written interview	16/03/2022
16.	EB4	Azerbaijan State University of Economics	16	AZE	Written interview	12/03/2022

Notes: Each code consists of the interviewee’s first and last names combined with a random number. PU stands for production union; PF means production facility; and ENG and AZE are the English and Azerbaijani languages, respectively.

The qualitative analysis followed a similar data generation procedure to that of Montrone et al. (2021). Initially, only a small sample of industry experts was identified through the reference procedure. Following the initial set of interviews, the initial sample size was iteratively expanded through the snowballing procedure (Gardner 2009; O’Reilly–Parker 2013). In addition, industry experts from leading chemical plants and factories were sought on professional networking platforms (e.g., LinkedIn). When the thematic saturation reached a minimum, the search for experts was stopped (Montrone et al. 2021; O'Reilly–Parker 2013). However, it should be noted that the number of experts in the field of Azerbaijan's chemical industry is extremely low; therefore, considering time and location constraints, 10 was deemed the optimal number of interviewees for the qualitative analysis.

A final sample of 16 experts was analyzed separately in two different groups, namely the industry expert group and the economist group. Two industry experts (AB6 and EA1) were the directors of former production plants in the chlorine and soda subsectors. One industry expert (MH1) was a former synthetic rubber production engineer who also worked for SOCAR and Azerikimya PU. The remaining industry experts were currently working in the industry, mainly in state-owned enterprises or public–private partnerships (TG1, NN7, MH4, etc.). Only one respondent was from the private sector of the chemical industry (OA9). The experts' experience ranged from 1.5 years to 40 years. The qualitative data of 9 of the 10 interviewees came from the recorded video and audio interviews, which were transcribed. The data from one interviewee came from the interview notes, which were used to reconstruct the interview. Most of the virtual face-to-face interviews were conducted using communication platforms such as Zoom, WhatsApp, or Skype. However, one interviewee (ISH8) shared his ideas through voice messages on WhatsApp. Azerbaijani was the main language of the interviews, but two experts in the field were interviewed in English (TG1 and MH4), as was a written interview with one economist (ERS8). All non-English recordings were translated into English.

4.3.4. Methodology of the quantitative analysis

First, the chemical industry subsectors were analyzed with the pool of explanatory variables using stepwise/OLS regression to create an initial baseline model with two regressors. The sample size was small and based on annual data; therefore, for feasibility, a stepwise regression algorithm was ordered to select only the two most important regressors for each chemical industry subsector. The econometric formulation of the first model is presented as follows:

$$y_{i,t} = \beta_0 + \beta_1 Z_t + \beta_2 Z_t + \epsilon_{i,t} \,, \tag{13}$$

where y is the output of the specific subsector of the chemical industry i in natural value (tons or thousands of tons) at time t; β_0 is the intercept coefficient; β_1 and β_2 are the coefficients of the selected explanatory variables from the vector of Z at time t; and ϵ is the error term of the model i at time t.

Second, FMOLS regression was applied to the baseline model (Model 2), which provided an optimal estimate of the cointegrating regressors. FMOLS modifies the stepwise/OLS regression methods to unfold the serial correlation and endogeneity effects in the regressors resulting from the cointegration relationship (Mehmood–Shehid 2014). Third, the CCR technique of Park (1992) was applied to the baseline model to check for robustness (Model 3). CCR has several advantages over OLS and FMOLS, namely that it not only yields consistent constants and error terms but also an asymptotically efficient and unbiased median (Ogaki et al. 1996). Moreover, the obtained asymptotic distributions of the coefficients are free of nuisance parameters and normally conditioned (Ogaki et al. 1996). Ogaki et al. (1996) claimed that this property is an integral part of hypothesis testing and allows conventional interpretations of standard errors. Most critically, CCR is better suited to annual data and a small sample size, thus providing a method for testing robustness (Mehmood–Shehid 2014). However, as Nazemzadeh et al. (2015) argued, FMOLS and CCR rely on the very strong assumption that the cross-sectional error terms are independent. However, since this analysis was based on only one country, this concern was not an issue with the time-series data.

In Model 4 of the quantitative examination, the REER was included as an "essential variable" variable in the stepwise algorithm. A re-estimation of the baseline models was performed to determine how the initial model changed. A formal representation of Model 4 is presented as follows, where the variables are the same as in Formula 1:

$$y_{i,t} = \beta_0 + \beta_1 REER_t + \beta_2 Z_{i,t} + \beta_3 Z_{i,t} + \epsilon_{i,t} \tag{14}$$

To identify the long-run relationship, robust least squares (RLS) was applied to the level data with outliers. Essentially, two models were created using RLS. One was the long-run estimate of the baseline model specified with stepwise/OLS (Models 1–3), and the second RLS estimation included the adjusted model with the REER specified as the "essential variable" regressor (Model 4). The last strategy allowed the impact of DD on the specific lagging subsectors of Azerbaijan's economy to be examined more closely.

Tables A5.1, A5.2, and A5.3 in the Appendix present the unit root tests, correlation, and Johansen cointegration analysis, respectively. According to the results, the variables were nonstationary in their level form. Therefore, their first difference was used for the regression estimates. Pearson’s R correlation coefficients revealed a strong negative correlation between the chemical industry subsectors and DD-related variables. Finally, long-run models could be built for the analysis because the variables of interest displayed a cointegration relationship.

4.3.5. Methodology of the qualitative analysis

The methodology for the qualitative analysis consisted of semistructured and structured expert interviews. A total of 14 questions were asked to the industry experts, which were divided into five categories. The first category was aimed at understanding the integration of Soviet-era technologies into Azerbaijan’s post-Soviet production capacity; the second category concerned market structure, labor supply, domestic and foreign investment, and competitiveness; the third category concerned oil prices and the impact of the oil industry on chemical subsectors; the fourth category covered specific subsectors of the chemical industry, with the main objective of understanding why certain subsectors have collapsed while others have developed; lastly, the fifth category collected data on the challenges, problems, and sustainable production potential in the chemical industry.[103]

The interviews with the economists was based on both structured and semistructured interview techniques, as some economists agreed to be interviewed through online communication tools, while others only allowed written interviews. According to Montrone et al. (2021), the results of qualitative research based on expert interviews may contain subjective elements as they depend on the authors’ own judgment. To strive for maximum objectivity and reproducibility, only experts who would be able to answer the questions completely and objectively were selected. The written interviews were structured, while the video interviews were semistructured, which allowed for interactive discussions.

The questions posed and the theoretical framework for the qualitative analysis referred to DD theory and the process of de-industrialization provided by Corden and Neary (1982) and Corden (1984). The chemical industry was considered a non-oil manufacturing industry in this study, although it is closely related to the oil and gas sector.

[103] For the complete list of the interview questions, see Table A5.4 in the Appendix section.

The most critical part of the qualitative analysis was the coding. Linneberg and Korsgaard (2019) mentioned that a code allows large amounts of qualitative data, such as paragraphs, sentences, or words, to be broken down into small pieces to prepare the data for analysis. A code is "a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (Saldaña 2015: 3, as cited in Linneberg–Korsgaard 2019). On average, 44.6% of all text data from the expert interviews were coded.

Coding was both inductive and deductive, meaning that some codes were designed before the coding process began while some emerged during the reading and coding of the interview data. The software package used for the coding and analysis was Quirkos version 2.4.1. Quirkos allows users to work interactively with data by iteratively coding and recoding research-related themes. To establish coherence, each new transcript was reviewed and compared with those already classified. To present the results clearly, ideas expressed only once were not coded, while statements that occurred repeatedly in the interview transcripts were coded. This is a standard and widely used approach to coding (see Read et al. 2020, who used the same coding procedure in the case of a health care study). The codes and their groupings are presented in Figures A5.8 and A5.9 in the Appendix.[104]

[104] The analysis of the economists involved adopting a slightly different coding and grouping strategy because the economists also offered their opinions about the non-oil industrialization policy of the Azerbaijan government. The codes and their groupings can be seen in Figure 5.2A.

CHAPTER 5

RESULTS

This section reports the results from examining the collected data through quantitative and qualitative methods. Section 5.1 reports on the analysis of NRC in the Azerbaijani economy. Section 5.2 reports on the economic explanation of NRC, namely DD as a precondition for de-industrialization. Finally, 5.3 analyzes a specific sector of the non-oil industry, namely the chemical industry. Each section begins with a brief description of the general analytical process that should be expected from that section and concludes with a summary subsection.

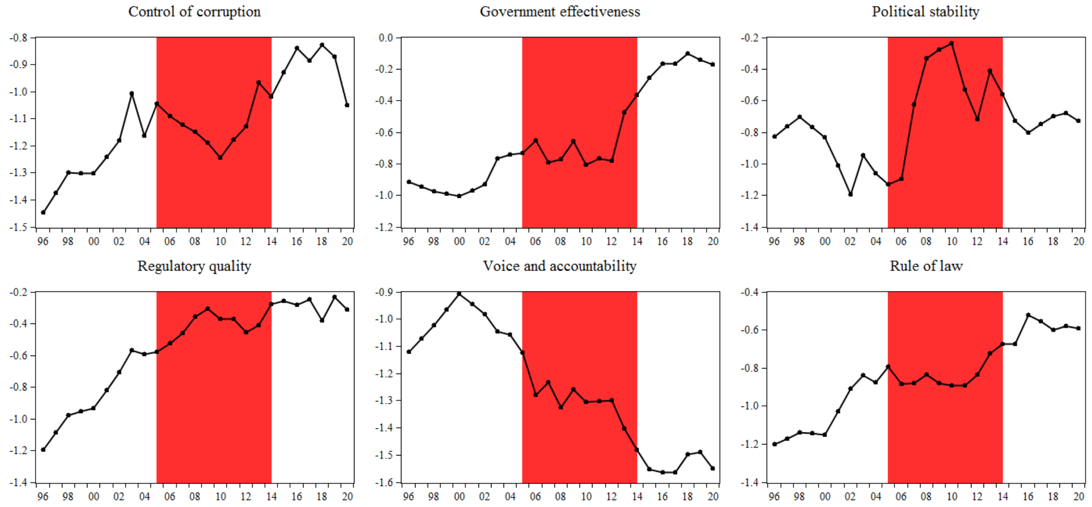
5.1. The Analysis of Natural Resource Curse Theory in the Azerbaijan's Economy

The focus of this section is the NRC phenomenon in Azerbaijan. This was analyzed by figure analysis, t-test, PCA, regression estimates, and interpretations of WVS.

5.1.1. Figure analysis

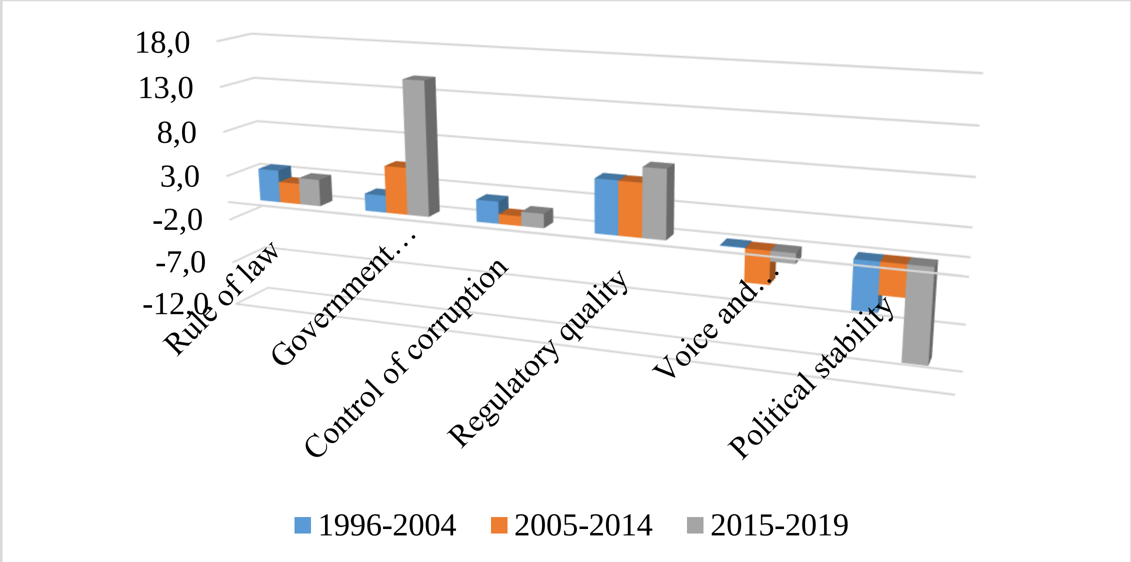
Figure 5.1 indicates that indices such as control of corruption, government effectiveness, and rule of law experienced either a downward trend or a slowdown as soon as the oil boom started in 2005. However, political stability dramatically improved starting from 2006 but fell between 2011 and 2013. Interestingly, political stability values during the post-boom period were lower than in the first half of the oil boom period. Next, regulatory quality started to decline in 2009 but recovered after 2012. Among the selected institutional variables, voice and accountability display a strong negative trend starting in 2000. Lastly, it seems that there were positive developments in the rule of law index in 2006 and a recovery after 2012. All of these observations pointed to the relevance of the adverse effects of the oil boom on Azerbaijan's economy. This led this study to systematically investigate oil-related variables in connection with institutional quality.

Figure 5.1: Worldwide governance indicators for Azerbaijan, 1996–2020.



Source: Author's own calculations based on World Bank Worldwide Governance Indicators.
Notes: Red denotes the oil boom period between 2005 and 2014.

Figure 5.2: Distribution of year-over-year average growth rates for institutional quality, based on the development phases of Azerbaijan's economy (index values).



Source: Author's own calculations based on World Bank Worldwide Governance Indicators.

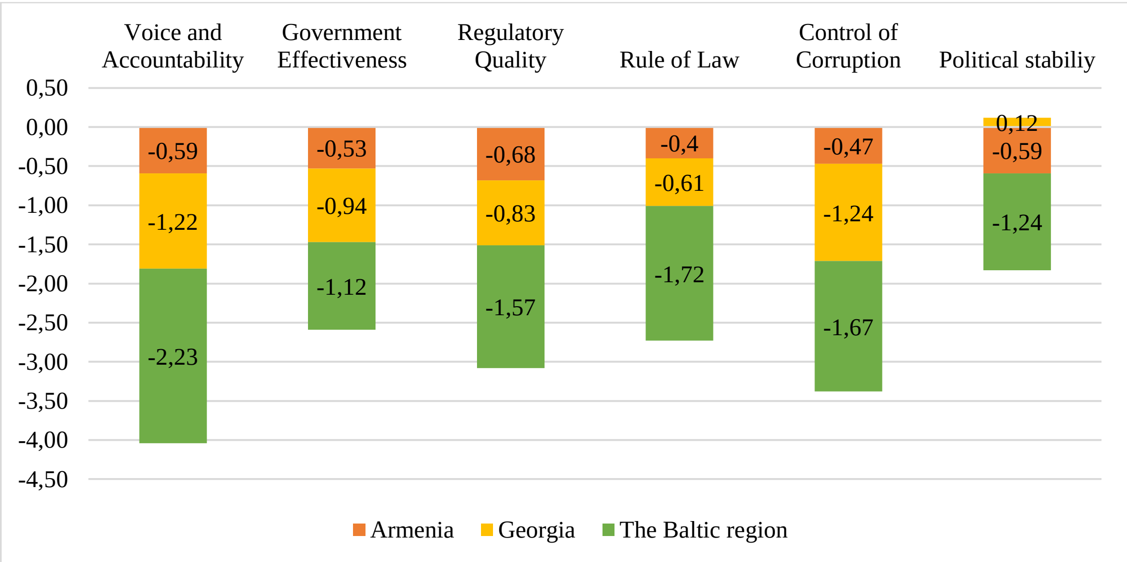
The year-over-year growth rates illustrated in Figure 5.2 indicate that of the six institutional variables, four were associated with lower development during the oil boom period, which is 50% more compared with the results in Figure 5.1. Specifically, the rule of law, control of corruption, regulatory quality, and the voice and accountability indices displayed a lower average growth rate compared with the catch-up period of Azerbaijan's economy. During the post-boom period, only one indicator—

the political stability index—had a severe deterioration. Further analyses of the collected data uncovered more information about institutional quality in Azerbaijan's economy.

5.1.2. Results of one-sample t-test and international comparison

According to the results of a one-sample t-test, Azerbaijan's mean institutional quality was lower than those of oil-poor Armenia, Georgia, and the Baltic region during the oil boom years (see Figure 5.3). Overall, the largest difference was with the Baltic region; with Georgia the difference was large; while with Armenia it was the smallest. Only in terms of the political stability index did Azerbaijan perform better than Georgia with a mean difference of 0.12. The following subsections present the results of the PCA and OLS regression and discuss them in detail.

Figure 5.3: Comparison of institutional quality of Azerbaijan with non-resource post-Soviet countries during the oil boom period (2005–2014).



Source: Author's own calculations based on the collected data.
Notes: (1) The values are mean differences obtained from a one-sample t-test; (2) all mean differences are statistically significant at the 5% level, excluding the mean difference with Georgia in the case of political stability.

5.1.3. Results of PCA

PCA allows researchers to reduce large data sets into more manageable principal components that account for the most variation in the variables. Before the PCA, the relevance of the data set for PCA had to be analyzed, for which the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were applied. To produce optimal principal components, the data set was analyzed in its original form, and then irrelevant variables were dropped (see Jaba et al. 2009 for similar PCA adjustments). If KMO values are higher than 0.300, then PCA is recommended (Kaiser 1974). As presented in Table 5.1, the KMO value was 0.772 in the first analysis phase; moreover, Bartlett's test of sphericity revealed high significance, suggesting that at least one correlation was significant among the variables. In the second phase of the analysis, the KMO value dropped to 0.624, but it was still higher than the expected threshold values and still highly significant according to Bartlett's test of sphericity.

Table 5.1: Kaiser–Meyer–Olkin (KMO) values and Bartlett's test results.

1st phase		
KMO measure of sampling adequacy		0.772
Bartlett's test of sphericity	Approx. chi-square	303.784
	df	55
	Sig.	0.000
2nd phase		
KMO measure of sampling adequacy		0.624
Bartlett's test of sphericity	Approx. chi-square	142.479
	df	21
	Sig.	0.000

Source: Author's own calculations based on the collected data.

The applicability of PCA is heavily dependent on communalities (i.e., common features). In PCA, a variable's communality value reveals how much of the variation is explained by the extracted component. A number larger than 0.35 is suitable for PCA analysis to reach a significance level of 0.05 and a level of power of 80% (Tsiouni et al. 2021). The greater the communality value, the more it explains the variance of the original variable of interest. The extraction was high in variables such as control of corruption, rule of law, and government effectiveness indices (see Table 5.2.). Oil rents and the oil boom had values of 0.764 and 0.766, respectively. EDI and the government integrity index had the lowest extraction values, but they still exceeded the level of 0.600.

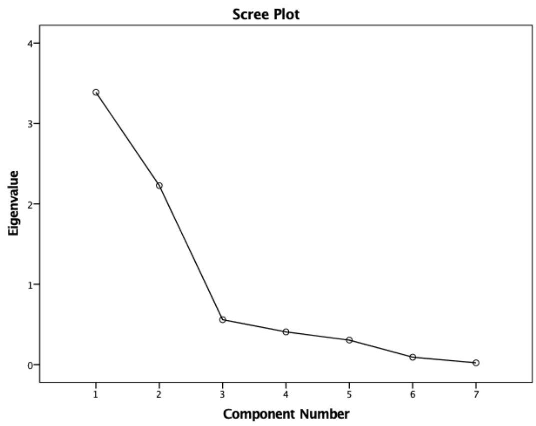
Table 5.2: Communalities of the variables related to institutional quality and the oil sector in Azerbaijan's economy.

Communalities		
	Initial	**Extraction**
COC	1	0.920
ROL	1	0.944
GOVEFF	1	0.927
GOVINT	1	0.634
OIL_RENTS	1	0.764
EDI	1	0.660
OIL_BOOM	1	0.766

Source: Author's own calculations based on the collected data.
Notes: Extraction method = principal component analysis.

The first component accounted for 47.7% of the variation based on rotation sums of squared loadings. The second component individually accounted for 32.6% but cumulatively 80.2% of the variation in the data set. Although the main variables were reduced to two principal components, the fact that these numbers are high indicates that enough information was stored (see Table A5.1, Appendix section).

Figure 5.4: Scree plot of the variables related to institutional quality and the oil sector in Azerbaijan's economy.



Source: Author's own calculations based on the collected data.

Next, the scree plot in Figure 5.4 indicates that the optimal number of components out of the original variables is 2 because the eigenvalues drop below 1 if the number of the components is higher than 2.

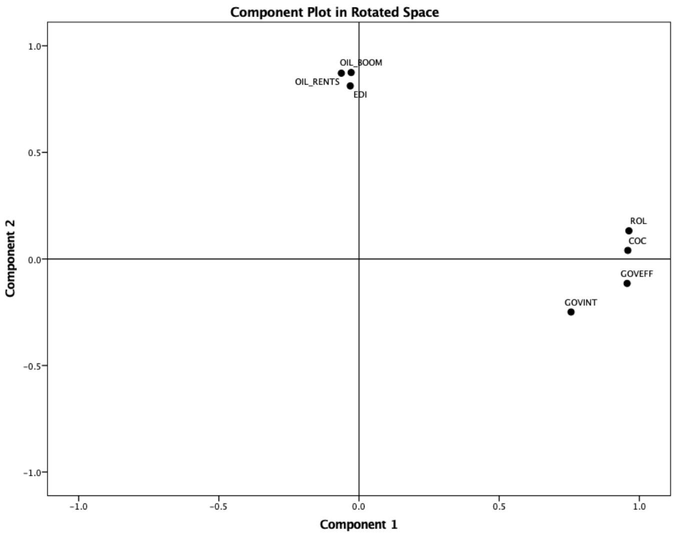
Table 5.3 presents the main results of the PCA, including the component matrix and rotated component matrix. From both matrices, it became clear that the first component covers the variation among variables such as control of corruption, rule of law, government effectiveness, and government integrity, as they loaded high and positively on it. Similarly, the second component was the most optimal subset of the oil-related variables, such as oil rents, EDI, and oil boom. Therefore, the first component should be called "institutional quality" and the second component should be called "oil factor." Visual representations of the loadings are depicted in Figure 5.5.

Table 5.3: Component matrices of the principal component analysis (PCA) related to institutional quality and the oil sector in Azerbaijan's economy.

Component Matrix[a]			**Rotated Component Matrix[b]**		
	Component			**Component**	
	1	**2**		**1**	**2**
COC	0.929	0.24	COC	0.959	0.04
ROL	0.913	0.331	ROL	0.963	0.132
GOVEFF	0.959	0.088	GOVEFF	0.956	−0.115
GOVINT	0.792	−0.085	GOVINT	0.756	−0.249
OIL_RENTS	−0.245	0.839	OIL_RENTS	−0.063	0.872
EDI	−0.201	0.787	EDI	−0.031	0.812
OIL_BOOM	−0.211	0.849	OIL_BOOM	−0.028	0.875
Extraction method: PCA			Extraction method: PCA. Rotation method: Varimax with Kaiser normalization.		
a – two components extracted.			b – rotation converged in three iterations.		

Source: Author's own calculations based on the collected data.

Figure. 5.5: Component plot in rotated space of institutional quality and the oil sector in Azerbaijan's economy.



Source: Author's own calculations based on the collected data.

5.1.4. Results of the DOLS and OLS analyses

Before performing a regression analysis of the extracted components, the stationarity of the variables of interest was checked. Table A5.2 (Appendix section) presents the augmented Dickey–Fuller (ADF) unit root test results of the principal components. All variables became stationary at their first difference; therefore, the DOLS models also used their first difference form.

The DOLS model of the principal components with one lead and one lag identified a statistically significant and negative impact of the oil factor on institutional quality in Azerbaijan (see Table 5.4). The sign of the coefficient related to the oil factor was always negative in the DOLS model and the intercept was positive and statistically significant.

Table 5.4: Dynamic ordinary least squares (DOLS) results of the oil factor and institutional quality in Azerbaijan's economy.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
C	0.13**	0.11**	0.15**	0.15**	0.15**
	(2.18)	(1.75)	(2.86)	(2.62)	(2.35)
Oil factor	−0.23	−0.30	−0.42**	−0.28	−0.30
	(−1.68)	(−1.68)	(−2.48)	(−1.30)	(−1.51)
R-squared	0.11	0.14	0.24	0.30	0.30
S.E. of regression	0.32	0.31	0.26	0.27	0.29
Long-run variance	0.08	0.08	0.05	0.06	0.08
Jarque–Bera	1.04	0.55	0.34	0.51	0.55
	[0.595]	[0.759]	[0.843]	[0.777]	[0.757]
Wald test – F-stat.	3.55**	2.63*	6.35***	4.01**	3.30*

Source: Author's own calculations based on the collected data.
Notes: Model 1: without lags and leads; model 2: one lag, zero leads; model 3: one lag, one lead; model 4: two lags, one lead; model 5: two lags, two leads.

The next part of the regression analysis included some individual indicators that were definitely related to the NRC doctrine (see Table 5.5). They were out-of-pocket expenditures on healthcare (OP_EXP_HC), total government expenditure on education (TGEE), and human rights (HUM_RIGHTS). These variables were regressed against the following oil-related variables: oil rents, share of oil exports in GDP, EDI, economic shocks, oil FDI, mining industry's share of overall industrial production, and share of SOFAZ in the state budget.

The human rights scores provided unambiguous results regarding the NRC as EDI, oil FDI, mining industry's share of overall industrial production, and share of SOFAZ in the state budget exhibited negative and statistically significant coefficients. Next, oil rents and EDI negatively and statistically significantly influenced TGEE.

However, the share of oil exports in GDP and economic shocks positively impacted TGEE. Lastly, out-of-pocket expenses on health care tended to rise when EDI rose and economic shocks occurred, but oil rents and oil exports as a share of GDP negatively affected out-of-pocket expenses on health care.

All of the models were statistically significant according to significant F statistics, moderate R-squared values, and no multicollinearity issues as the variance inflation factors (VIFs) were less than 10.0. Moreover, CUSUM and CUSUMSQ tests indicated that the models were stable. Furthermore, the models were functionally correct, without any serial correlation and heteroscedasticity problems. Lastly, the Wald test indicated that all coefficients differed from zero in a statistically significant manner.

Table 5.5: OLS results of individual NRC-related indicators against oil-related variables.

Dep. Var.	**OP_EXP_HC**	**TGEE**	**HUM_RIGHTS**
C	13.34**	−0.17***	0.01
	(2.88)	(−3.25)	(0.15)
Oil Rents	−2.84***	−0.01	
	(−3.02)	(−0.74)	
Oil Exp/GDP	−108.24**	1.15*	
	(−1.89)	(1.77)	
EDI	5.11*	−0.19**	−0.01**
	(1.84)	(−2.78)	(2.24)
Econ. Shocks	33.38**	0.43***	
	(2.82)	(3.21)	
Oil FDI			−3.44***
			(−3.84)
Mining Industry			−0.01**
			(−2.76)
SOFAZ's Share			−0.01*
			(−1.94)
R-squared	0.76	0.64	0.58
Adj. R-squared	0.71	0.54	0.46
F-stat.	12.10	6.23	4.76
F-stat. prob.	0.00	0.00	0.01
Variance inflation factors	All <10.00	All <10.00	All <10.00
CUSUM	Within 5% sig.	Within 5% sig.	Within 5% sig.
CUSUMSQ	Within 5% sig.	Within 5% sig.	Within 5% sig.
Ramsey reset test	Functional spec. is true	Functional spec. is true	Functional spec. is true
Wald test (F-stat.)	16.04***	7.40***	6.60***
Wald test ($\chi 2$)	80.22***	37.92***	33.02***
JBN test	0.48	0.11	1.80
JBN test Prob. value	0.79	0.94	0.41
Serial corr. (F-stat.)	0.17	1.77	0.76
Serial corr. (Obs*R2)	0.53	4.33	2.13
Heteros. (F-stat.)	1.82	2.02	1.76
Heteros. (Obs*R2)	6.48	6.96	6.37

Source: Author's own calculations based on the collected data.

Notes: (1) Dep. var = dependent variable; (2) OP_EXP_HC = out-of-pocket expenditure on health care; (3) TGEE = total government expenditure on education; (4) HUM_RIGHTS = human rights; (5) *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively; (6) the figures were rounded to two decimal places for compactness; (7) values inside parentheses indicate standard errors and those inside brackets are t-statistics.

5.1.5. Results of the WVS analysis

The NRC doctrine emphasizes the importance of political, institutional, and governance factors in resource-rich countries when it comes to managing their resource wealth. The increasing body of literature—including this study—is focused on macroeconomic indicators that reflect institutional quality, political and governance trends, and human capital and education. However, although it is difficult to diagnose the exact cause–effect relationship between institutional failures and resource wealth, their reflection on society among citizens' perception of NRC-related channels may offer insight into the presence of NRC in a qualitative manner. In other words, if members of society are not interested in managing the politics of the country, democracy and governance quality will be endangered and the opportunistic behavior of politicians will be readily supported through rent-seeking activities.

The levels of trust and confidence that society has in government transparency determine the institutional capacity to manage resource wealth. If citizens have little faith in political and governance institutions, resource wealth will not contribute to the country's economic development. These findings are documented in the NRC literature, but they have been based on quantitative data. Therefore, qualitative data are worth examining even if they are limited (e.g., by the number of respondents) and to some extent prone to bias (e.g., bad answers to survey questions). An evaluation of WVS results could provide insight into the relevance of NRC syndrome in Azerbaijan's economy and fill some gaps in the literature.

First, survey results related to the importance of and interest and confidence in politics and political parties in Azerbaijan were examined, mainly between 1994 and 2020. Then, political actions such as voting, signing of petitions, and boycotting were examined.

This study found that the importance of politics for Azerbaijani citizens decreased from 10% to 4% between 1994 and 2020, as measured by the "very important" category of the survey question that identified the importance of politics (see Table 5.6). The number of respondents evaluating politics as "rather important" decreased during the first and second halves of the oil boom period compared with the recession period (27% between 1994 and 1998); however, this figure rose to 31%

between 2017 and 2020 from lows such as 24% and 18% between 2005 and 2014. Notably, the number of citizens who were uninterested in politics increased during the oil boom period. However, a decrease occurred in the number of people who viewed politics as “not very important” or “not at all important” during the same period (from 43% between 2010 and 2014 to 35% in 2017 and 2020). Lastly, the percentage of respondents who were uncertain about the importance of politics in their lives increased from 2% during the oil boom period (2005–2014) to 3% between 2017 and 2020. Overall, not many citizens regarded politics as important during the oil boom period; most citizens actually viewed politics as unimportant.

Table 5.6: Importance of politics among Azerbaijani citizens (in %), Question wording: *For each of the following aspects, indicate how important it is in your life – **Politics**. Would you say it is very important, rather important, not very important, or not important at all?*

	1994–1998	2005–2009	2010–2014	2017–2020
Very important	10	19	8	4
Rather important	27	24	18	31
Not very important	42	30	43	35
Not at all important	21	26	31	26
Don’t know	1	2	0	3
(N)	**2,002**	**1,505**	**1,002**	**1,817**

Source: World Values Survey (WVS)
Notes: Due to technicalities in the rounding process for the data section of the WVS webpage, the summary of each column exceeds 100% in some cases.

While the importance of politics may be high for many citizens, their interest in it may be less certain. Political actions are required to engage with the government apparatus because resource-rich countries are notorious for repressing the political will of their citizens. Although interest in politics exhibited a modest increase of 1 percentage point between 2005 and 2009 compared with 1994–1998, the survey results indicated that only 6% and 4% of respondents were “very interested” in politics in 2010–2014 and 2017–2020, respectively (see Table 5.7). Additionally, the percentage of respondents who were “somewhat interested” rose to 37% during the first half of the oil boom compared with the recession period. However, the smallest number of people expressed an interest in politics during the second half of the oil boom period (2010–2014). Conversely, most of the responses fell into the “not very interested” and “not at all interested” categories. The percentage of respondents who were “not at all interested” experienced the sharpest and steepest increase after 1994–1998, rising from

24% to 36% in 2017–2020. Moreover, uncertainty among survey participants declined from 2% and 5% during the 1994–1998 and 2005–2009 periods, respectively, to 0% and 1% during the 2010–2014 and 2017–2020 periods, respectively.

Table 5.7: Interest in politics among Azerbaijani citizens (in %), Question wording: *How interested would you say you are in politics?*

	1994–1998	2005–2009	2010–2014	2017–2020
Very interested	8	9	6	4
Somewhat interested	33	37	18	27
Not very interested	32	47	44	32
Not at all interested	24	1	32	36
Don't know	2	5	0	1
(N)	**2,002**	**1,505**	**1,002**	**1,817**

Source: World Values Survey (WVS)

Note: Due to technicalities in the rounding process for the data section of the WVS webpage, the summary of each column exceeds 100% in some cases.

The importance of and interest in politics would partially reflect the social reality if the NRC is present in Azerbaijan. Actions such as signing petitions and participating in boycotts demonstrate the real intentions of citizens when they are dissatisfied with the government. Therefore, people who have already undertaken or may undertake such actions can serve as a proxy indicator for the suppressed political will of a society. Table 5.8 indicates that the categories of "have done" and "may do" fluctuated from 1994 to 2020, corresponding to the low shares in the overall answers. However, the percentage of respondents who said that they would never sign a petition reached 91% between 2010 and 2014—the highest since the recession period. However, this decreased to 63% during the post-boom period. There was also a dramatic increase of 10 percentage points regarding uncertainty about signing a petition between 2017 and 2020 compared with the oil boom period. Thus, the oil boom period weakened the will of citizens to politically act if necessary through tools such as petitions and demonstrations.

Table 5.8: Intensity of political action in Azerbaijan, as measured by willingness to sign a **petition** (in %), Question wording: *Now I'd like you to look at this card. I'm going to read out some different forms of political action that people can take, and I'd like you to tell me, for each one, whether you have actually done any of these things, whether you might do it or would never, under any circumstances, do it.*

	1994–1998	2005–2009	2010–2014	2017–2020
Have done	9	13	4	7

May do	15	31	6	19
Would never do	69	56	91	63
Don't know	6	0	0	10
No answer	0	0	0	2
(N)	**2.002**	**1.505**	**1.002**	**1.817**

Source: World Values Survey (WVS)
Note: Due to technicalities in the rounding process for the data section of the WVS webpage, the summary of each column exceeds 100% in some cases.

Similarly, people who participated in a boycott as a political action declined from 19% between 2005 and 2009 to 0% between 2010 and 2014; there was a moderate increase of 1 percentage point from 2017 to 2020 (see Table 5.9). Between 1994 and 2014, the percentage of respondents who said that they might participate in a boycott exhibited a downward trend (from 12% to 5%); however, between 2017 and 2020, 14% of respondents said they would agree to participate in a boycott. The percentage of respondents who said that they would never participate in a boycott peaked between 2010 and 2014 (95%). Uncertainty about whether to participate in a boycott increased during 2017–2020, with 2% and 9% of respondents choosing "no answer" and "don't know," respectively. Like signing petitions, a decreased propensity to join a boycott was also negatively associated with the oil boom period.

Table 5.9: Intensity of political action in Azerbaijan, as measured by willingness to participate in a **boycott** (in %), Question wording: *Now I'd like you to look at this card. I'm going to read out some different forms of political action that people can take, and I'd like you to tell me, for each one, whether you have actually done any of these things, whether you might do it or would never, under any circumstances, do it.*

	1994–1998	2005–2009	2010–2014	2017–2020
Have done	2	19	0	1
May do	12	7	5	14
Would never do	80	72	95	74
No answer	0	1	0	2
Don't know	6	1	0	9
(N)	**2,002**	**1,505**	**1,002**	**1,817**

Source: World Values Survey (WVS)
Note: Due to technicalities in the rounding process for the data section of the WVS webpage, the summary of each column exceeds 100% in some cases.

Regarding confidence in political parties, the highest expression of confidence on the survey was captured through the answer category of "a great deal" (see Table 5.10). In Azerbaijan, confidence in political parties sharply declined from 16% (1994–

1998) and 26% (2005–2009) to 10% and 7% during 2010–2014 and 2017–2020, respectively. However, 26% of respondents indicated that they had confidence in the government from 2005 to 2014. Similarly, those who had confidence in politicians (i.e., those who chose “quite a lot” as a response) rose from 31% during the recession period (1994–1998) to 39% between 2005 and 2009; however, the figure fell by 7 and 15 percentage points during the second half of the oil boom and the post-boom period, respectively. Meanwhile, the percentage of respondents who did not trust political parties peaked at 36% between 2010 and 2014; this figure was 26% between 1994 and 1998 and 17% between 2005 and 2009. During the post-boom period, the number of citizens who had little trust in political parties decreased to 28%. Similarly, the percentage of respondents who completely distrusted political parties (i.e., those who chose “none at all” in the survey) increased to 23% between 2010 and 2014; this remained the same for 2017–2020. In addition, the number of people who were uncertain or did not know how to feel toward political parties (i.e., the sum of the “don’t know” and “no answer” categories) rose to 17% between 2017 and 2020. Thus, it can be argued that, compared with the recession period and the first half of the oil boom, citizens’ confidence in the government decreased during the second half of the oil boom. In addition, a significant group of people remained uncertain about their confidence in the government during the post-boom period.

Table 5.10: Confidence in political parties in Azerbaijan (in %), Question wording: *I am going to name a number of organizations. For each one, could you tell me how much confidence you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence, or none at all? (Political parties)*

	1994–1998	**2005–2009**	**2010–2014**	**2017–2020**
A great deal	16	26	10	7
Quite a lot	31	39	32	24
Not very much	26	17	36	28
None at all	14	16	23	23
Don’t know	14	2	0	15
No answer	0	0	0	2
(N)	**2,002**	**1,505**	**1,002**	**1,817**

Source: World Values Survey (WVS)

Note: Due to technicalities in the rounding process for the data section of the WVS webpage, the summary of each column exceeds 100% in some cases.

Voting remains one of the most critical indicators of the political involvement of citizens. Therefore, voting data at both the local and national levels can provide information about ongoing trends related to the actuality of NRC syndrome in Azerbaijan. As seen in Table 5.11, the percentage of respondents who "always" voted at the local level increased by 2 percentage points between 2017 and 2020 compared with 2010–2014. However, at the national level, a decrease occurred from 39% to 34% for the same category. Respondents who "usually" voted comprised the largest group between 2017 and 2020, accounting for 40% and 41% of the sample at the local and national levels, respectively. However, it is interesting that 43% of respondents never voted at the local level and 32% never voted at the national level between 2010 and 2014. Moreover, there was an overall increase of four and five percentage points (measured by summing the categories "don't know" and "no answer") in the voting behavior of citizens between 2017 and 2020 compared with 2010 and 2014. Although it is difficult to argue that high levels of low voting behavior are directly related to the NRC phenomenon, the percentage of people who voted during the post-boom period increased compared with the oil boom period.

Table 5.11: Voting participation of Azerbaijani citizens in local and national elections (in %), Question wording: *Vote in elections: National level; Vote in elections: Local level*

	Local level		**National level**	
	2010–2014	**2017–2020**	**2010–2014**	**2017–2020**
Always	30	32	39	34
Usually	28	40	29	41
Never	43	23	32	20
Not allowed to vote	0	0	0	0
Don't know	0	1	0	3
No answer	0	3	0	2
(N)	**1,002**	**1,817**	**1,002**	**1,817**

Source: World Values Survey (WVS)
Note: Due to technicalities in the rounding process for the data section of the WVS webpage, the summary of each column exceeds 100% in some cases.

Next, Azerbaijani citizens' perception of the government reflects the political mood, which might be relevant when seeking to observe signs of the NRC. Although confidence in the government decreased from 37% to 22% between the late recession and catch-up period and the first half of the oil boom (measured through the answer category of "a great deal"), confidence grew to 47% during the second half of the oil boom, followed by a decrease of 6 percentage points between 2017 and 2020 (see Table 5.12). Meanwhile, the percentage of respondents who answered "quite a lot" exhibited a gradual drop during the oil boom period (from 49% in 1994–1998 to 36% and 33% in 2005–2009 and 2010–2014, respectively) but recovered to 49% during the post-boom period. The responses “not very much” and “none at all” indicated low to no confidence in the government. During the first half of the oil boom period, people’s lack of confidence in the government increased from 7% to 40% (as measured by the sum of the categories “not very much” and “none at all”) but decreased at the end of the oil boom and post-boom periods. There was also a slight increase of 3 percentage points in uncertainty among citizens between 2017 and 2020, as measured by the sum of the categories “don’t know” and “no answer.”

Table 5.12: Level of confidence in the government among Azerbaijani citizens (in %), Question wording: *I am going to name a number of organizations. For each one, could you tell me how much confidence you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence, or none at all? The government (in your nation’s capital).*

	1994–1998	**2005–2009**	**2010–2014**	**2017–2020**
A great deal	37	22	47	41
Quite a lot	49	36	33	49
Not very much	5	22	10	6
None at all	2	18	10	1
Don’t know	7	2	0	2
No answer	0	0	0	1
(N)	**2,002**	**1,505**	**1,002**	**1,817**

Source: World Values Survey (WVS)
Note: Due to technicalities in the rounding process for the data section of the WVS webpage, the summary of each column exceeds 100% in some cases.

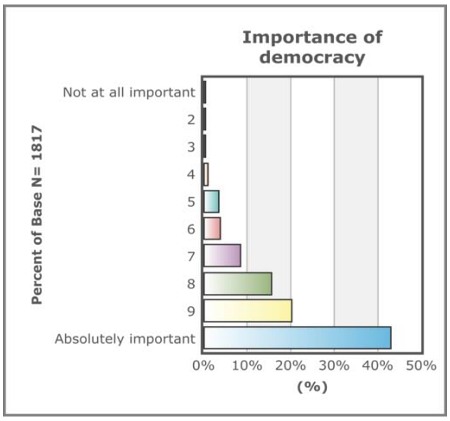
Another part of the WVS examined the perception of democracy among citizens (see Figure 5.5, panel *a*). Democracy is among the main set of values of people worldwide and is an essential indicator of social and economic dynamics. The survey found that 87.2% of respondents valued democracy in their lives. Moreover, 66.5% of respondents between 2017 and 2020 viewed the government as the main provider of or as responsible for individual well-being in Azerbaijan (see Figure 5.5, panel *b*).

As an organizing tool that enables workers to defend their rights, labor unions are critical. In the survey, the highest confidence level in labor unions was represented by the answer category of “a great deal.” The percentage of respondents who selected this answer notably increased by 18 percentage points between 2005 and 2009 from 4%

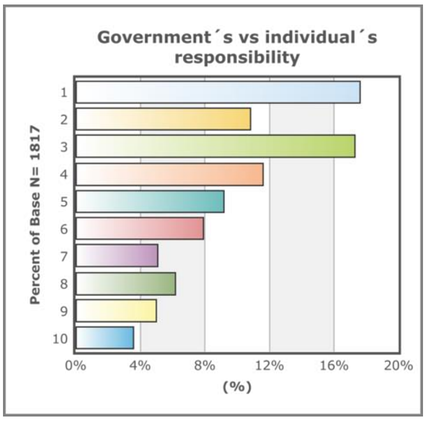
between 1994 and 1998 (see Table 5.13). This increase was followed by a decrease to 9% and 10% from 2010 to 2014 and 2017 to 2020, respectively. Citizens increased their confidence in labor unions from 1994 to 2014—first from 23% to 34%, and then to 36%. However, a decrease of four percentage points occurred between 2017 and 2020, as measured by responses in the "quite a lot" category. The highest distrust in labor unions (44%) occurred between 1994 and 1998. The percentage of respondents who answered "not at all" peaked at 24% during the second half of the oil boom period, but then decreased by 14 percentage points during the post-boom period. Interestingly, the percentage of people who responded "don't know" also dramatically increased from lows of 0–1% during the oil boom period to 23% between 2017 and 2020. Thus, the state of confidence in labor unions in Azerbaijan was ambiguous.

Figure 5.6: Democracy and government responsibility in Azerbaijan, 2017–2020.

a. How important is it for you to live in a country that is governed democratically? On this scale, where 1 means it is "not at all important" and 10 means "absolutely important," what position would you choose?



b. Government vs. individual responsibility (1 = the government should take more responsibility to ensure that everyone is provided for or 2 = people should take more responsibility to provide for themselves).



Source: World Values Survey (WVS).

Furthermore, Azerbaijani citizens' confidence in the justice system and courts rose during the first half of the oil boom compared with the recession period (from 5% to 27%, see Table 5.14). However, this upward trend was interrupted during the second half of the oil boom (decreasing from 27% to 23% in 2005 and 2009 and to 10% in 2010 and 2014), as measured by the percentage of respondents who answered "a great deal." Most respondents (41%) answered "quite a lot" between 2005 and 2009; then, this declined to 26% between 2010 and 2014 before rising again to 48% between 2017 and 2020. Although many respondents were not confident in the justice system and courts during the late recession and early transition periods (42% did not have much trust), 20–23% of respondents indicated slight distrust—as measured by the "not very much" category—toward the justice system and courts in Azerbaijan between 2005 and 2020. The second half of the oil boom saw the highest percentage of respondents who had little or no confidence in the justice system (19%), which declined by a further 13 percentage points from 2017 to 2020. A noticeable increase occurred in the uncertainty level among citizens who were asked about their confidence in the justice system. The categories of "don't know" and "no answer" rose to 16% and 1%, respectively, between 2017 and 2020 from 0% in 2010 and 2014. Overall, the majority of respondents had confidence in the justice system and courts, although the percentage with a doubtful perception of the justice system is rising.

Table 5.13: Confidence in labor unions among Azerbaijani citizens (in %), Question wording: *I am going to name a number of organizations. For each one, could you tell me how much confidence you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence, or none at all? (Labor unions)*

	1994–1998	2005–2009	2010–2014	2017–2020
A great deal	4	22	9	10
Quite a lot	23	34	36	32
Not very much	44	31	31	23
None at all	20	12	24	10
Don't know	10	1	0	23
No answer	0	0	0	1
(N)	**2,002**	**1,505**	**1,002**	**1,817**

Source: World Values Survey (WVS).
Note: Due to technicalities in the rounding process for the data section of the WVS webpage, the summary of each column exceeds 100% in some cases.

5.1.6 Summary of the section

In this chapter, the typical signs of NRC syndrome in Azerbaijan's economy were examined through figure analysis, PCA, DOLS, OLS regressions, and an evaluation of WVS results. The use of both quantitative and qualitative methods enabled an analysis of the underlying government- and society-related dynamics of the NRC to relate it to economic concepts such as DD. To this end, data related to institutions, governance, and human capital in Azerbaijan were collected, mainly covering the period 1996–2019.

The figure and survey analyses allowed a visualization of the national economy and society-wise patterns in institutional quality concerning the economic development phases. Moreover, PCA and variable-specific modeling enabled this study to capture the typical NRC signs to estimate them for the hypothesis testing.

Table 5.14: Confidence in the justice system and courts among Azerbaijani Citizens (in %), Question wording: *I am going to name a number of organizations. For each one, could you tell me how much confidence you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence, or none at all? (Justice system/courts)*

	1994–1998	**2005–2009**	**2010–2014**	**2017–2020**
A great deal	5	27	23	10
Quite a lot	39	41	36	48
Not very much	42	20	23	20
None at all	8	11	19	6
Don't know	5	2	0	16
No answer	0	0	0	1
(N)	**2,002**	**1,505**	**1,002**	**1,817**

Source: World Values Survey (WVS).
Note: Due to technicalities in the rounding process for the data section of the WVS webpage, the summary of each column exceeds 100% in some cases.

Moreover, a figure analysis of selected institutional variables related to Azerbaijan's economy revealed negative trends and slowdowns in institutional quality, as measured by variables such as control of corruption, government effectiveness, voice and accountability, and the rule of law as soon as the oil boom period started. In addition, year-over-year and periodic averages of the growth rates revealed a systematic decline in institutional quality during the oil boom years. For example, the period 2005–2014 had lower year-over-year growth rates for the rule of law, control of corruption, regulatory quality, and voice and accountability indices compared with the recovery phase. Azerbaijan's average institutional quality is lower than that of its resource-poor post-Soviet counterparts, such as Georgia, Armenia, and the Baltic region. Furthermore, Azerbaijan is the most resource-dependent FSU country with low levels of institutional quality. This descriptive exploration allowed this study to go further and apply empirical methods to test for the presence of noneconomic sides of NRC syndrome.

Therefore, the PCA indicated that institutional quality and oil-related variables can be explained by a few key variables, principal components, and a DOLS analysis. The latter demonstrated that the oil sector negatively affected the institutional quality in

Azerbaijan between 1996 and 2019. Variables such as out-of-pocket expenses on health care and total government expenditures on education and human rights exhibited statistically significant and negative associations with oil-related variables, and they captured the negative nexus between human capital channels of the NRC and the oil sector.

Lastly, substantive and pervasive institutional failures in Azerbaijan that impeded the efficient management of oil wealth were traced with the help of data from the large-scale, cross-national WVS. Results related to the main survey questions about politics and government were compared to demonstrate the societal dimensions of Azerbaijan’s institutional climate during the last years of the oil boom and post-boom periods. The main results illustrated the developmental origins of the NRC doctrine in Azerbaijan’s economy. They indicated that, despite trusting the government and believing that officials are responsible for maintaining citizens’ individual welfare and well-being, respondents were not interested in changing the government through political parties supported by citizens’ voting behavior and engaging in political actions such as petitions and boycotts. In other words, although respondents mentioned democracy as the main value for society, their interest in elections and voting remained low during the second half of the oil boom period. Bidirectional expectations from the government, a lack of participation, and an unwillingness to create change created a fertile ground for the NRC to develop. This affects the lives of Azerbaijani citizens in the form of low institutional, governance, human capital, and education quality. Although the WVS proved to be useful to this study, Braun et al. (2014) highlighted a main limitation in terms of the long-term validity of cross-national surveys, namely that it is threatened by the intercultural nature of the surveys. This means that over time, the same questions can be interpreted differently by different cultures following certain social changes. Moreover, due to some methodological artifacts, the results of the same survey questions may be noticeably different from time to time.

5.2. Analysis of DD

This chapter aims to examine DD signs and effects on Azerbaijan's economy by applying various empirical techniques that capture the impact of the oil boom. Although the oil boom allowed Azerbaijan to escape extreme poverty, complaints regarding the negative effects of lopsided industrial production were voiced by Arvanitopoulos (1998), Hoffman (1999), and Laurila (1999) as early as 1998.

Critical challenges considered typical symptoms of DD are as follows: appreciation of the REER, lower competitiveness in non-oil sectors (including agriculture), low production, low employment in manufacturing, and high domestic price levels. Although several studies have attempted to establish signs of DD in Azerbaijan’s economy, there is no overwhelming empirical evidence for their existence. Therefore, this study examined the signs of DD using various linear models, such as vector autoregressive (VAR), Bayesian VAR (BVAR), ordinary least squares (OLS), and fully modified OLS (FMOLS). The resource movement and spending effects of the theory were addressed separately. However, before examining the specific effects of DD on Azerbaijan’s economy, the sectoral impact (in three sector models—booming, lagging, and non-tradeable sectors) of DD-related indicators was analyzed. Specifically, an Azerbaijan-specific literature review (Section 4.1) was conducted in three directions, namely on early studies that expressed initial concerns about DD in the medium and long term; direct studies on DD that have attempted to prove the existence of the phenomenon; and indirect studies that have focused on the components of DD rather than the symptoms. Section 4.2 discusses the data and methodology of the chapter. Section 4.3 then presents the results of the study. Lastly, Section 4.4 draws some pertinent conclusions.

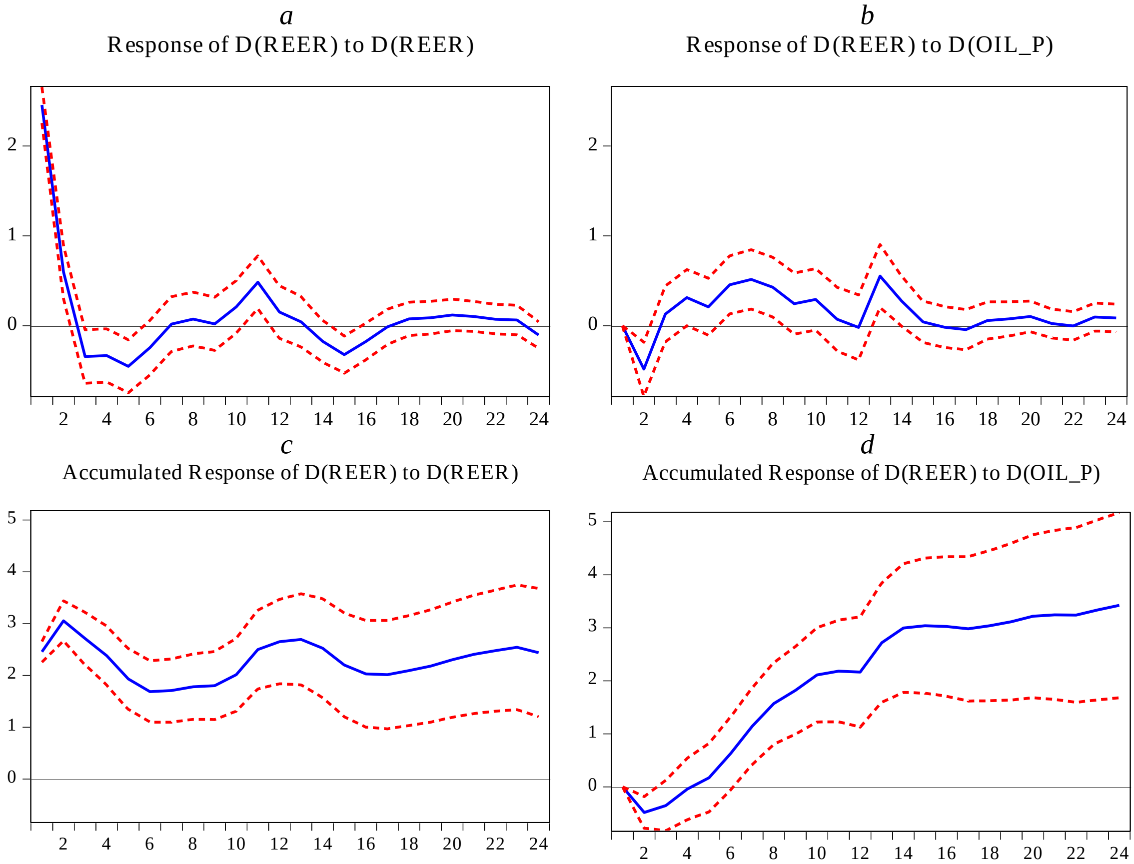
5.2.1. Appreciation of REER

Unrestricted standard VAR was used to discover how the REER changes in the short term when the price of oil changes. However, prior to the analysis, an ADF test was conducted to determine whether the variables of interest were stationary (see Table A5.3 in the Appendix). According to the results, the REER and oil prices are not stationary in their level form, but they become stationary in their first difference. Therefore, the VAR model of REER appreciation was run using the first difference of both the REER and oil prices.

Then, the optimum lag order was selected based on the AIC, which was 12 (see Table A5.4 in the Appendix). The LR and FPE criteria also confirmed this. However, one or two lags according to the SC and HQ criteria were not empirically meaningful for the large data set based on monthly data. Finally, a 12-month lag was chosen and included in the model.

Figure 5.7 depicts the impulse response functions (IRFs). The REER positively responds to the oil price shocks after the first and second months (see Figure 5.7, panel *b*). In the 13th month, the REER exhibits a spike in its positive response. Moreover, the cumulative responses of the REER to oil price shocks also exhibit a significant positive trend (see Figure 5.7, panel *d*). The REER's response to its own shocks exhibits fluctuations (see panels *a* and *c* in Figure 5.7).

Figure 5.7: Impulse response functions of the VAR model, 1995M01–2020M12.



Source: The author's own calculations based on the collected data.
Notes: Response to Cholesky one S.D. Innovations ± 2 S.E; D(REER) represents the real effective exchange rate and D(OIL_P) denotes the oil prices.

To verify the validity of the aforementioned findings, the results of VAR needed to be subjected to a series of stability tests. For example, using the roots of a characteristic polynomial, the dynamically stable model could be tested for the requirement of model stability. The VAR model would be stable if all of its eigenvalues fell within the unit circle. The inverse roots of the autoregressive (AR) characteristic polynomial are illustrated in Figure A5.1 (Appendix). All eigenvalues lie inside the circle.

Other diagnostics of the VAR model included tests of residual autocorrelation and residual serial correlation LM. There should be no significant deviations of the residual autocorrelation values from two standard error bounds. The test results indicated that all residuals up to 12 lags were within two standard error bounds (see Figure A5.2 in the Appendix). The tests of the serial correlation of the residuals LM revealed that the estimated VAR model was free from serial correlation up to 12 lags (see Table A5.4 in the Appendix).

Table 5.15 lists the forecast error (SE) as a percentage of the error from the VAR error, while each column indicates how much of this error was explained by each variable. In this case, the variance decomposition technique was used because it provided the necessary information about the relative importance of each random shock (Ayadi 2005). The oil prices could explain up to 17.99% of the forecast error for the next 24 months, while the REER could explain 82.01%.

Table 5.15: The variance decomposition of DREER.

Period	**S.E.**	**D(REER)**	**D(OIL_P)**
1	2.46	100	0
2	2.57	96.49	3.51
6	2.73	91.98	8.02
10	2.85	85.27	14.73
14	2.97	82.00	18.00
18	2.99	82.21	17.79
22	3.00	82.13	17.87
24	3.01	82.01	17.99

Source: The author's own calculations based on the collected data.
Notes: Here, the figures were rounded to the second decimal place for compactness.

Furthermore, the individual and joint significance of oil prices in the VAR Granger causality test, as well as a unidirectional causal effect from oil prices to REER, were consistent with the IRFs (see Table 5.16).

Table 5.16: VAR Granger causality/block exogeneity Wald tests and pairwise Granger causality tests between REER and oil prices, 1995M01–2020M12.

VAR Granger Causality/Block Exogeneity Wald Tests			
Excluded	Chi-sq.	df	Prob.
D(OIL_P)	64.16	12	0.000
All	64.16	12	0.000
Pairwise Granger Causality Tests			
Null Hypothesis:	Obs.	F-Statistic	Prob.
OIL_P does not Granger Cause REER	300	4.02	0.001
REER does not Granger Cause OIL_P		0.46	0.939

Source: The author's own calculations based on the collected data.
Notes: Twelve lags were included in the pairwise Granger causality tests; figures were rounded to the second decimal place for compactness (excluding the probability values).

The long-run relationship between the REER and oil prices was estimated by applying the FMOLS and canonical cointegration regression (CCR) techniques (see Table 5.17). The long-run relationship revealed that a 1% increase in oil prices led to a 15% appreciation of the Azerbaijani REER. Exactly the same result was obtained using the CCR technique.

Table 5.17: FMOLS and CCR results of the analysis of oil prices on the REER, 1995M01–2020M12.

Fully Modified OLS (FMOLS)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LOG(OIL_P)	0.15	0.03	4.82	0.000
C	4.06	0.12	33.38	0.000
R-squared	0.25	Mean dependent var.		4.64
Adjusted R-squared	0.25	S.D. dependent var.		0.19
S.E. of regression	0.16	Sum squared resid.		8.29
Long-run variance	0.13			
Canonical Cointegration Regression (CCR)				
LOG(OIL_P)	0.15	0.03	4.86	0.000
C	4.06	0.12	33.65	0.000
R-squared	0.25	Mean dependent var		4.64
Adjusted R-squared	0.25	S.D. dependent var		0.19

Source: The author's own calculations based on the collected data.
Notes: The figures were rounded to the second decimal place for compactness (excluding the probability values).

5.2.2. Sectoral effects of EDI, REER, NEER, oil prices, and oil rents

According to the results of the Johansen cointegration test (reported in Table A5.5 in the Appendix), all variables of interest displayed cointegration relationships. This allowed the estimation of long-run linear models to capture the sectoral effects of the REER, NEER, oil prices, and oil rents.

While the results of the models presented here reveal said sectoral effects of the EDI, REER, NEER, oil prices, and oil rents, they do not necessarily reflect the precise effects of DD, namely resource movement and spending effects. The sectoral effects of the DD-related variables were previously studied in a more focused approach on resource movement and spending by Mironov and Petronevich (2015).

Table 5.18 indicates that the EDI positively affected output in the booming sectors (Eqs. 1 and 2), while the manufacturing output and value-added were negatively affected by the EDI (Eqs. 3–6).

Moreover, the association between the NEER and S_B was negative and statistically significant. The same direction of the relationship between the NEER and manufacturing output as well as value-added was positive. However, since the REER was the second control variable for the exchange rate, Eqs. 4 and 6 demonstrate that manufacturing output and value-added have significantly negative links with the REER.

Table 5.18: Sectoral implications of REER, NEER, oil prices, and oil rents for 1990–2019.

Equation Name:	**1**	**2**	**3**	**4**	**5**	**6**
Dependent Variable	**SB_OUT_SH**	**SB_OUT_SH**	**SM_OUT_SH**	**SM_OUT_SH**	**SM_VA_SH**	**SM_VA_SH**
EDI	**4.31*** **	**3.07*** **	**−2.71*** **	**−2.22*** **	**−0.44**	**−0.25**
	(1.45)	(0.61)	(0.87)	(0.65)	(−0.26)	(−0.2)
	[2.98]	[5.00]	[−3.09]	[−3.41]	[−1.69]	[−1.27]
NEER_66	**−0.19*** **		**0.09** **		**0.03*** **	
	(0.06)		(0.04)		(0.01)	
	[−3.01]		[2.36]		[2.88]	
OIL_BOOM	**10.93** **	**4.20***	**−6.69** **	**−2.92**	**−0.92**	**0.20**
	(4.68)	(−2.1)	(2.83)	(−2.23)	(−0.85)	(−0.67)
	[2.34]	[2.00]	[−2.36]	[−1.31]	[−1.09]	[0.30]
OIL_PRICES	**−0.03**	**−0.19*** **	**0.02**	**0.11** **	**−0.01**	**0.02***
	(−0.09)	(0.04)	(−0.06)	(0.04)	(−0.02)	− 0.01)
	[−0.32]	[−5.20]	[0.40]	[2.80]	[−0.59]	[1.76]
OIL_RENTS	**0.40***	**0.72*** **	**−0.10**	**−0.28*** **	**−0.02**	**−0.08*** **
	(−0.21)	(0.08)	(−0.13)	(0.09)	(−0.04)	(0.03)
	[1.89]	[8.53]	[−0.76]	[−3.06]	[−0.49]	[−2.91]
C	**54.29*** **	**18.35*** **	**20.36*** **	**38.88*** **	**8.68*** **	**14.92*** **
	(7.88)	(2.14)	(4.77)	(2.28)	(1.43)	(0.69)
	[6.89]	[8.56]	[4.27]	[17.07]	[6.08]	[21.66]
@TREND	**0.95*** **	**0.62*** **	**−0.33** **	**−0.12**	**−0.21*** **	**−0.16*** **
	(0.25)	(0.11)	(0.15)	(−0.12)	(0.05)	(0.04)
	[3.78]	[5.45]	[−2.18]	[−0.97]	[−4.68]	[−4.32]
REER_66		**0.29**		**−0.16*** **		**−0.05*** **
		(0.03)		(0.03)		(0.01)
		[10.37]		[−5.49]		[−5.54]
Observations:	29	29	29	29	29	29
R-squared:	0.88	0.95	0.72	0.81	0.83	0.88
Adj-R-squared	0.85	0.93	0.64	0.75	0.79	0.85
Long-run variance	35.52	6.81	12.99	7.69	1.17	0.70
JB Normality	1.65	0.68	0.04	3.29	1.25	0.20
	[0.44]	[0.71]	[0.98]	[0.19]	[0.54]	[0.90]
Centered VIF	All <10.00	All <10.00	All <10.00	All <10.00	All <10.00	All <10.00
Wald Test (F-stat.)	529.87***	2755.85***	117.45***	200.90***	200.78***	334.91***
Wald Test (Chi-Square)	3709.09***	19290.93***	822.15***	1406.31***	1405.48***	2344.37***

Source: The author's own calculations based on the collected data.
Notes: 1) Included observations: 29 after adjustments; 2) cointegrating equation deterministics: C and @Trend; 3) the long-run covariance estimate (prewhitening with lags = 3 from AIC maxlags = 3, Bartlett kernel, Newey–West fixed bandwidth = 4.0000); 4) *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively; 5) the figures were rounded to two decimal places for compactness; 6) the values inside parentheses show the standard errors, while those in brackets are the t-statistic; 7) no d.f. adjustment for standard errors & covariance; 8) the coefficients are presented in bold to make a clear distinction between the standard errors and t-statistic; and 9) SB_OUT_SH means the share of output of booming sectors in the overall output, SM_OUT_SH means the share of the manufacturing sector in the overall output, and SM_VA_SH means the share of manufacturing value-added in the overall value-added.

Equations 1 and 2 indicate that the oil boom period boosted output in the booming sectors while negatively affecting manufacturing output. However, this relationship was not stable; that is, the statistical significance disappeared after the NEER was replaced by the REER, but the coefficient remained negative. The same situation was found for manufacturing value-added, namely a negative association with the oil boom period (Eq. 5).

In addition, oil prices exhibited contradictory associations with the booming and manufacturing sectors. They had statistical significance along with the REER only in Eqs. 2 (negative), 4 (positive), and 6 (positive).

Moreover, oil rents had a statistically positive effect on booming sectors; however, they had a statistically negative effect on manufacturing value-added and output (Eqs. 3–6).

The next phase of clarifying the sectoral effects of the DD-related variables involved an analysis of value-added in agriculture (as the second part of the lagging sectors in the three-sector approach) and in non-tradeable sectors. Equations 7–10 in Table 5.19 present the resulting estimates.

The EDI was negatively and statistically significantly associated with value-added in agriculture (Eqs. 7 and 8), while it was positively but not significantly associated with the non-tradeable sectors (Eqs. 9 and 10). The NEER exhibited only one statistically significant association with value-added in the non-tradeable sector (Eq. 10 – negative). The REER had a negative and statistically significant effect on value-added in the agriculture sector (Eq. 8). The REER positively impacted non-tradeable value-added (Eq. 10). Oil prices and oil rents had a negative and statistically significant effect on both agriculture and non-tradeable value-added (Eqs. 7–10). Oil prices yielded significant results only when combined with the REER variable (Eqs. 8 and 10 – positive and negative, respectively). Finally, all of the intercepts and trend components were statistically significant.

Table 5.19: Sectoral implications of REER, NEER, oil prices, and oil rents, for 1990–2019 (continued).

Equation Name:	**7**	**8**	**9**	**10**
Dependent Variable:	**SA_VA_SH**	**SA_VA_SH**	**SNT_VA_SH**	**SNT_VA_SH**
EDI	**−0.97***	**−0.81****	**0.49**	**0.19**
	(−0.54)	(0.38)	(−0.41)	(−0.30)
	[−1.80]	[−2.15]	[1.18]	[0.62]
NEER_66	**0.03**		**−0.05****	
	(−0.02)		(0.02)	
	[1.11]		[−2.64]	
OIL_BOOM	**−3.54***	**−2.24***	**−2.82****	**−4.26*****
	(−1.75)	(−1.29)	(1.34)	(1.03)
	[−2.02]	[−1.73]	[−2.11]	[−4.14]

OIL_PRICES	**0.03**	**0.06****	**−0.02**	**−0.06*****
	(−0.03)	(0.02)	(−0.03)	(0.02)
	[0.87]	[2.66]	[−0.66]	[−3.10]
OIL_RENTS	**−0.15***	**−0.20*****	**−0.44*****	**−0.35*****
	(−0.08)	(0.05)	(0.06)	(0.04)
	[−1.88]	[−3.86]	[−7.29]	[−8.51]
C	**27.63*****	**33.45*****	**45.2*****	**36.54*****
	(2.95)	(1.32)	(2.25)	(1.05)
	[9.36]	[25.34]	[20.08]	[34.79]
@TREND	**−0.88*****	**−0.75*****	**0.21*****	**0.18*****
	(0.09)	(0.07)	(0.07)	(0.06)
	[−9.36]	[−10.77]	[3.01]	[3.14]
REER_66		**−0.07*****		**0.06*****
		(0.02)		(0.01)
		[−3.80]		[4.37]
Observations:	29	29	29	29
R-squared:	0.93	0.95	0.82	0.85
Adj-R-squared	0.93	0.93	0.78	0.81
Long-run variance	4.98	2.58	2.90	1.64
	0.67	9.09	1.23	0.05
JB Normality	[0.72]	[0.01]	[0.54]	[0.98]
Centered VIF	All <10.00	All <10.00	All <10.00	All <10.00
Wald Test (F-stat.)	201.53***	382.56***	1591.72***	2820.04***
Wald Test (Chi-Square)	1410.70***	2677.92***	11141.02***	19740.29***

Source: The author's own calculations based on the collected data.

Notes: 1) Included observations: 29 after adjustments; 2) cointegrating equation deterministics: C and @Trend; 3) the long-run covariance estimate (prewhitening with lags = 3 from AIC maxlags = 3, Bartlett kernel, Newey–West fixed bandwidth = 4.0000); 4) *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively; 5) the figures were rounded to two decimal places for compactness; 6) the values inside parentheses indicate the standard errors, while those in brackets are the t-statistic; 7) no d.f. adjustment for standard errors & covariance; 8) the coefficients are presented in bold to make a clear distinction between the standard errors and t-statistic; and 9) SA_VA_SH means the share of agriculture value-added in the overall value-added, while SNT_VA_SH means the share of non-tradeable value-added sectors in the overall value-added.

Table 5.20 summarizes employment between 1990 and 2019. Employment in the booming sectors was positively and statistically significantly affected by the EDI, NEER, and oil rents (Eqs. 11 and 12). Oil prices and REER negatively affected employment in the lagging sectors, but the EDI, NEER, and oil rents had positive connections. Then, the EDI, NEER, and oil rents negatively affected employment in non-tradeable sectors, but oil prices and REER had a significantly positive impact (Eqs. 15 and 16). Finally, all constants in Eqs. 11–16 were highly significant, but the trend component of Eqs. 11 and 12 did not exhibit significance.

Table 5.20: Sectoral implications of REER, NEER, oil prices, and oil rents for 1990–2019 (continued).

Equation Name:	**11**	**12**	**13**	**14**	**15**	**16**
Dependent Variable:	**SB_EMP_SH**	**SB_EMP_SH**	**SL_EMP_SH**	**SL_EMP_SH**	**SNT_EMP_SH**	**SNT_EMP_SH**
EDI	**0.02**	**0.05****	**0.61*****	**0.99*****	**−0.62*****	**−1.02*****
	(0.01)	(0.02)	(0.16)	(0.28)	(0.17)	(0.29)
	[1.40]	[2.50]	[3.77]	[3.55]	[−3.68]	[−3.49]
NEER_66	**0.01*****		**0.05*****		**−0.05*****	
	(0.00)		(0.01)		(0.01)	

	[9.15]		[7.07]		[−7.17]	
OIL_BOOM	**−0.05**	**0.02**	**−0.65**	**0.09**	**0.67**	**−0.11**
	(0.04)	(0.06)	(0.52)	(0.95)	(0.55)	(1.00)
	[−1.54]	[0.35]	[−1.24]	[0.09]	[1.22]	[−0.11]
OIL_PRICES	**−0.01*****	**0.01**	**−0.05*****	**−0.01**	**0.05*****	**0.01**
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)
	[−3.23]	[0.66]	[−4.48]	[−0.85]	[4.44]	[0.79]
OIL_RENTS	**0.01*****	**0.01****	**0.16*****	**0.10*****	**−0.17*****	**−0.10*****
	(0.01)	(0.01)	(0.02)	(0.04)	(0.02)	(0.04)
	[8.41]	[2.80]	[6.89]	[2.50]	[−7.02]	[−2.54]
C	**0.32*****	**0.98*****	**35.07*****	**42.30*****	**64.37*****	**56.72*****
	(0.06)	(0.07)	(0.88)	(0.97)	(0.92)	(1.02)
	[5.26]	[14.88]	[39.70]	[43.47]	[69.85]	[55.54]
@TREND	**−0.01**	**−0.01**	**0.09*****	**0.05*****	**−0.09*****	**−0.05**
	(0.01)	(0.01)	(0.03)	(0.05)	(0.03)	(0.05)
	[−0.48]	[−0.80]	[3.18]	[0.99]	[−2.92]	[−0.83]
REER_66		**−0.01*****		**−0.03*****		**0.03*****
		(0.01)		(0.01)		(0.01)
		[−3.53]		[−2.20]		[2.22]
Observations:	29	29	29	29	29	29
R-squared:	0.65	0.55	0.66	0.55	0.66	0.54
Adj-R-squared	0.56	0.43	0.57	0.42	0.57	0.42
Long-run variance	0.01	0.01	0.45	1.40	0.49	1.55
	3.63	0.44	6.92	0.42	7.01	0.40
JB Normality	[0.16]	[0.80]	[0.03]	[0.81]	[0.03]	[0.82]
Centered VIF	All <10.00	All <10.00	All <10.00	All <10.00	All <10.00	All <10.00
Wald Test (F-stat.)	1763.25***	564.87***	17418.09***	5525.06***	26556.38***	8344.05***
Wald Test (Chi-Square)	12342.78***	3954.11***	121926.6***	38675.41***	185894.7***	58408.37****

Source: The author's own calculations based on the collected data.

Notes: 1) Included observations: 29 after adjustments; 2) cointegrating equation deterministics: C and @Trend; 3) the long-run covariance estimate (prewhitening with lags = 3 from AIC maxlags = 3, Bartlett kernel, Newey–West fixed bandwidth = 4.0000); 4) *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively; 5) the figures were rounded to two decimal places for compactness; 6) the values inside parentheses indicate the standard errors, while those in brackets are the t-statistic; 7) no d.f. adjustment for standard errors & covariance; 8) the coefficients are presented in bold to make a clear distinction between the standard errors and t-statistic; and 9) SB_EMP_SH, SL_EMP_SH, and SNT_EMP_SH denote the share of employment of booming sectors, lagging sectors, and non-tradeable sectors, respectively.

Finally, Table 5.21 reports the export side of the distribution of the effects of the EDI, REER, NEER, oil prices, and oil rents. Initially, the exports of S_B were significantly and positively associated only with the EDI. However, after the NEER (Eq. 17) was replaced by the REER (Eq. 18), oil rents and the REER were also significantly positively associated with S_B exports. Moreover, oil prices and the oil boom period had a significantly negative coefficient. The reason for this was related to the fact that production and, consequently, exports in Azerbaijan rose and fell rapidly after the transition period. Even though Azerbaijan's development phase (2005–2014) can be described as an oil boom, it was not associated with higher export shares. Moreover, the negative sign for oil prices but positive sign for oil rents meant that exports of the booming sectors increased when profits also increased.

Equation 19 indicates that the EDI had a significantly negative effect on lagging sectors' exports. However, after using the REER, oil rents and the REER itself also had negative and significant coefficients. Interestingly, the oil boom and oil prices had a positive and statistically significant effect on exports of the S_L. This could indicate that the non-oil sectors are heavily subsidized by oil revenues. However, the appreciation of the REER and the increasing dependence on the extractive industry jeopardize the competitiveness of S_L.

Table 5.21: Sectoral implications of EDI, REER, NEER, oil prices, and oil rents for 1990–2019.

Equation Name:	**17**	**18**	**19**	**20**
Dependent Variable:	**SB_EXP_SH**	**SB_EXP_SH**	**SL_EXP_SH**	**SL_EXP_SH**
EDI	**7.36***** (2.18) [3.38]	**5.29***** (0.90) [5.88]	**−5.88***** (1.10) [−5.33]	**−5.56***** (0.72) [−7.73]
NEER_66	**−0.32***** (0.10) [−3.35]		**0.06** (0.05) [1.22]	
OIL_BOOM	**0.09** (7.04) [0.01]	**−10.03***** (3.08) [−3.26]	**2.91** (3.57) [0.82]	**6.60**** (2.46) [2.68]
OIL_PRICES	**−0.04** (0.14) [−0.26]	**−0.31***** (0.05) [−5.70]	**0.05** (0.07) [0.68]	**0.11**** (0.04) [2.61]
OIL_RENTS	**0.25** (0.32) [0.80]	**0.79***** (0.12) [6.36]	**−0.19** (0.16) [−1.18]	**−0.32***** (0.10) [−3.23]
C	**72.29***** (11.86) [6.10]	**14.32***** (3.15) [4.55]	**40.26***** (6.02) [6.69]	**54.94***** (2.52) [21.84]
@TREND	**1.60***** (0.38) [4.25]	**1.15***** (0.17) [6.87]	**−1.22***** (0.19) [−6.41]	**−0.94***** (0.13) [−7.02]
REER_66		**0.44***** (0.04) [10.83]		**−0.16***** (0.03) [−5.01]
Observations:	29	29	29	29
R-squared:	0.84	0.93	0.89	0.92
Adj-R-squared	0.80	0.91	0.86	0.90
JB Normality	1.60 [0.45]	0.74 [0.69]	1.04 [0.59]	0.85 [0.65]
Centered VIF	All <10.00	All <10.00	All <10.00	All <10.00
Wald Test (F-stat.)	329.16***	1797.59***	107.17***	236.36***
Wald Test (Chi-Square)	2304.10***	12583.14***	750.17***	1654.51***

Source: The author's own calculations based on the collected data.

Notes: 1) Included observations: 29 after adjustments; 2) cointegrating equation deterministics: C and @Trend; 3) the long-run covariance estimate (prewhitening with lags = 3 from AIC maxlags = 3, Bartlett kernel, Newey–West fixed bandwidth = 4.0000); 4) *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively; 5) the figures were rounded to two decimal places for compactness; 6) the values inside parentheses show the standard errors, while those in brackets are the t-statistic; 7) no d.f. adjustment for standard errors & covariance; 8) the coefficients are presented in bold to make a clear distinction between the standard errors and t-statistic; and 9) SB_EXP_SH denotes the share of the booming sectors in total exports, while SL_EXP_SH denotes the share of the lagging sectors in total exports.

Regarding the results of the goodness-of-fit and stability tests of the estimated models, all models had high values for R-squared and adjusted R-squared. Moreover, the intercept and trend components of the estimates were statistically significant. In addition, the equations had normally distributed residuals, with the exception of Eqs. 8, 13, and 15.

Furthermore, according to the centered VIF factors, all models were free from the problem of multicollinearity. The Wald test indicated that the coefficients obtained from the estimates contributed to the models being significantly different from zero. Finally, most models were free of autocorrelation and partial correlation problems up to 16 lags, as indicated by the correlogram Q-statistic results (available upon request).

5.2.3. The resource movement effect

Table 5.22 presents the OLS results for the resource movement effect in Azerbaijan's economy between 2000 and 2018. The estimated models had high R-squared and adjusted R-squared values, especially the models where output growth rates were the dependent variables. Furthermore, they had significant F-statistics (at both the 5% and 10% levels), and homoscedasticity and normally distributed residuals (except for Eq. 31, which has serial correlation). The sample size was 17 for all models.

Moreover, a statistically significant intercept was not found in any model, but more than half of the intercept coefficients found were negative. This indicated an overall downward linear trend in output and employment in the lagging and non-tradeable sectors. While the growth rate of output in S_B had a negative effect on output in S_L (Eq. 25, $ß = -0.21$, $t = -0.50$), that of employment in S_B negatively affected employment in S_{NT} (Eqs. 31 and 32, $ß = -0.01$, $t = -0.45$, and $ß = -0.01$, $t = -0.10$, respectively).

The estimates also indicated that the growth rates of output and employment in S_L are negatively related to the growth rate of output in S_B (Eq. 21, $ß = -0.10$, $t = -0.02$). The growth rate of employment in S_L only had a statistically significant effect on S_{NT} employment growth rates (Eqs. 31 and 32, $ß = -0.28$, $t = -2.58$, and $ß = -0.34$, $t = -2.90$, respectively).

Table 5.22: Resource movement effect of Dutch Disease in Azerbaijan's economy for 2000–2018.

	Dependent variable											
	Output growth rate:						**Employment growth rate:**					
Exp.var	**S_B**		**S_L**		**S_{NT}**		**S_B**		**S_L**		**S_{NT}**	
	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)
Intercept	0.10	−0.09	−0.35	−0.36	−0.48	−0.24	0.68	0.64	0.01	−0.01	−0.01	−0.01
	[0.02]	[−0.02]	[−0.27]	[−0.25]	[−0.16]	[−0.14]	[0.76]	[0.76]	[0.02]	[−0.03]	[−0.08]	[−0.09]
S_B-GR			−0.09	−0.21	1.19	0.23			8.91	0.02	−0.01	−0.01
			[−0.25]	[−0.50]	[1.50]	[0.46]			[0.01]	[0.56]	[−0.45]	[−0.10]
S_L-GR	−0.10	2.12			**−9.45***	−3.63	0.01	0.94			**−0.28****	**−0.34****
	[−0.01]	[0.19]			**[−2.07]**	[−1.29]	[0.01]	[0.56]			**[−2.58]**	**[−2.90]**
S_{NT}-GR	**−41.66****	**−43.59****	−6.03	**−9.04****			−1.36	−0.29	**−0.99****	**−0.96****		
	[−2.19]	**[−2.31]**	[−1.62]	**[−2.27]**			[−0.45]	[−0.10]	**[−2.58]**	**[−2.90]**		
Inc.AZN	0.78		**0.46*****		**0.67****		0.06		−0.02		**−0.01****	
	[1.24]		**[3.30]**		**[2.257]**		[0.62]		[−1.14]		**[−2.07]**	
Inc.USD		0.47		**0.23****		**0.89*****		0.10		**−0.02****		**−0.01****
		[1.10]		**[2.17]**		**[6.90]**		[1.56]		**[−2.21]**		**[−1.83]**
R^2	0.44	0.43	0.56	0.43	0.44	0.80	0.06	0.16	0.28	0.40	0.41	0.38
Adj. R^2	0.31	0.29	0.45	0.30	0.31	0.77	−0.15	−0.03	0.12	0.26	0.27	0.24
Obs.	17	17	17	17	17	17	17	17	17	17	17	17
F-stat.	3.36	3.22	5.40	3.25	3.42	18.37	0.30	0.84	1.72	2.90	2.98	2.66
Prob(F-stat)	**0.05**	**0.05**	0.45	**0.06**	**0.04**	**0.00**	0.83	0.49	0.21	**0.07**	**0.07**	**0.09**
$Het._{F\ stat}$	1.04	0.46	0.81	0.16	0.76	1.04	0.74	0.56	1.68	0.72	1.04	1.15
	[0.35]	[0.65]	[0.65]	[0.97]	[0.47]	[0.77]	[0.83]	[0.58]	[0.56]	[0.49]	[0.35]	[0.31]
JB_N	0.55	0.62	0.31	0.24	0.22	0.57	0.47	0.34	0.23	0.38	1.57	1.54
	[0.76]	[0.73]	[0.86]	[0.89]	[0.99]	[0.75]	[0.79]	[0.84]	[0.89]	[0.83]	[0.46]	[0.46]
LM test	0.77	0.21	1.77	0.77	0.55	1.92	0.51	0.55	0.89	1.13	4.06	1.56
	[0.36]	[0.79]	[0.12]	[0.37]	[0.50]	[0.10]	[0.52]	[0.49]	[0.31]	[0.23]	[0.03]	[0.14]

Source: The author's own calculations based on the collected data.
Notes: 1) GR means growth rate; 2) the bold coefficients highlight the significant results; 3) *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively; 4) the figures in brackets are the corresponding *t*-statistics; 5) the left-hand side of the table employs output growth rates, such as S_B-GR, S_L-GR, and S_{NT}-GR as independent variables; 6) the right-hand side of the table employs employment growth rates as independent variables, such as S_B-GR, S_L-GR, and S_{NT}-GR; 7) the estimations do not include any degree-of-freedom adjustment for standard errors and covariance; 8) all figures were rounded to the second decimal place for compactness; 9) $Het._{F\ stat}$ denotes the heteroscedasticity test based on the Breusch–Pagan–Godfrey method, JB_N denotes Jaque–Bera normality test results, and the LM test is the Lagrange multiplier test for serial correlation. The values in brackets indicate *p* values.

The growth rate of output in S_{NT} had several statistically significant effects, as depicted in Table 5.22. The presence of a strong negative relationship between the growth rates of output of S_B and S_{NT} (Eqs. 21 and 22, β = −41.66, t = −2.19 and β = −43.59, t = −2.32, respectively) and S_L and S_{NT} (Eq. 24, β = −9.04, t = −2.27) indicated that for Azerbaijan's economy, output of S_{NT} increased, S_B decreased over time, and S_L contracted. In this regard, a clear pattern of output spillovers exists. The growth rate of employment in S_{NT} also negatively affected S_L (Eqs. 29 and 30, β = −0.99, t = −2.58, β = −0.96, t = −2.90, respectively).

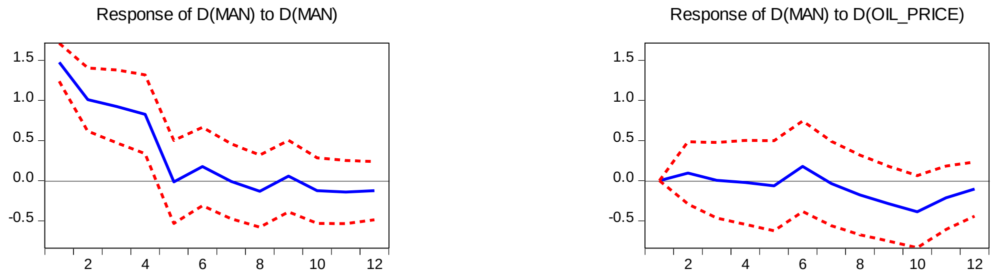
Furthermore, population income in this study captured the demand side of the economy in terms of wage levels, which would also affect the anticipated resource movement effect of DD. Therefore, Eqs. 23–26 revealed that population income had a positive relationship with output growth in the lagging and non-tradeable sectors in both AZN and USD. However, population income was negatively related to employment growth rates in the lagging and non-tradeable sectors, as clearly indicated by equations 30–32.

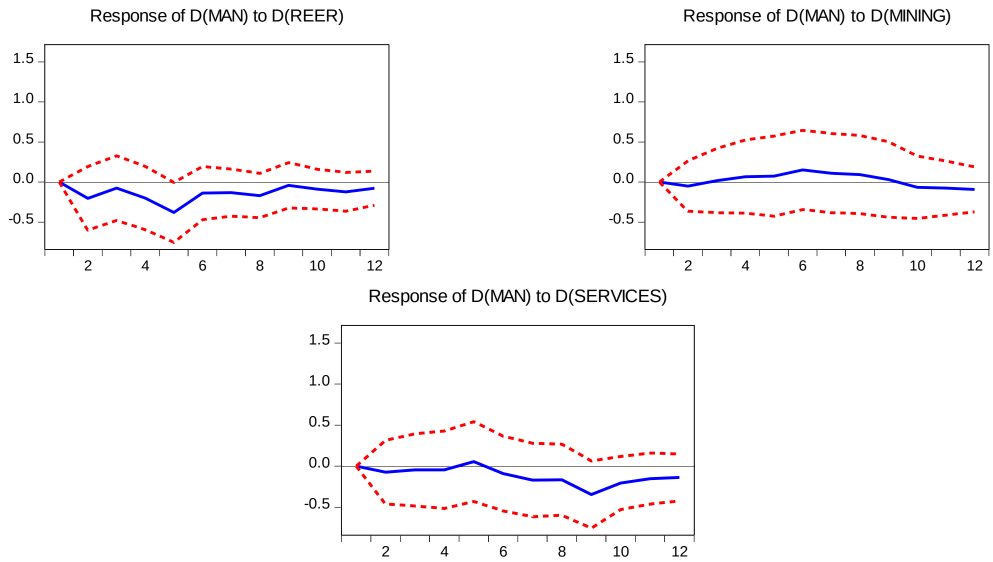
Figure 5.8 presents the IRFs of manufacturing employment relative to itself, oil prices, the REER, mining employment, and services employment. All estimations were carried out in the first difference of the variables of interest according to ADF test (see Table A5.6, Appendix). In the first four quarters, manufacturing employment can be observed to respond favorably to self-induced shocks, but from the fifth quarter it fluctuates until the tenth quarter.

The response of manufacturing employment to oil price shocks was initially positive (second quarter), but in the third, fourth, and fifth quarters it was either zero or negative. After the positive response to oil price shocks in the sixth quarter, the next three quarters exhibited negative responses.

Furthermore, manufacturing employment responded negatively to REER shocks over the periods examined. This suggests that the REER had a large impact on manufacturing, consistent with the symptoms predicted by the DD hypothesis. In addition, manufacturing employment responded unfavorably to mining employment shocks in the second quarter but positively from the third quarter to the ninth. This element of manufacturing and mining employment reflects the capital intensity of Azerbaijan's oil industry, as workers leaving the oil industry sector are theoretically absorbed by non-oil manufacturing. However, manufacturing employment responded negatively to the mining employment shocks that began in the eleventh quarter. Regarding the response of manufacturing employment to shocks in the service sector, it was positive only in the fifth quarter and negative in all other quarters.

Figure 5.8: Impulse response functions of manufacturing employment in VAR models.





Source: The author's own calculations based on the collected data.
Notes: 1) Response to Cholesky one S.D. Innovations ± 2 S.E; 2) MAN denotes manufacturing employment, MINING is mining employment in thousands of persons, and SERVICES is the employment figure in the service sector in thousands of persons. Similarly, REER is the real effective exchange rate and OIL_PRICE denotes oil prices.

Finally, VAR Granger causality tests were conducted to determine whether the time series used in the study could predict each other, particularly for manufacturing employment. The results did not support a unidirectional causal relationship between the variables of interest and manufacturing employment (see Table 5.23). Nevertheless, the REER and mining employment could be predicted based on manufacturing employment and oil prices because of their individual and combined statistical significance.

Table 5.23: Results of VAR Granger causality tests.

Dep. Var.	**ΔMAN**	**ΔOIL_P**	**ΔREER**	**ΔMIN**	**ΔSERV**	**ΔJS**
ΔMAN	–	5.31	6.09	0.83	1.99	14.38 (0.811)
		(0.379)	(0.298)	(0.975)	(0.851)	
ΔOIL_P	4.76	–	2.97	4.81	2.30	8.87
	(0.446)		(0.705)	(0.440)	(0.807)	(0.984)
ΔREER	9.85	74.41	–	13.55	10.13	90.86
	(0.080)*	(0.000)***		(0.019)**	(0.071)	(0.000)***
ΔMIN	21.34	9.80	6.11	–	3.98	48.21
	(0.000)***	(0.081)*	(0.295)		(0.552)	(0.000)***
ΔSERV	3.17	1.06	3.60	1.77	–	8.22
	(0.674)	(0.957)	(0.678)	(0.879)		(0.990)

Source: The author's own calculations based on the collected data.
Notes: 1) *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively; 2) figures were rounded to the second and to third decimal place for compactness; 3) figures in parentheses are the corresponding probability values; and 4) MAN, OIL_P, REER, MIN, SERV, and JS denote manufacturing employment, oil prices, real effective exchange rate, mining employment, services employment, and joint significance, respectively.

The VARs were stable and passed all standard diagnostic tests. The Appendix contains the results of the characteristic polynomial AR, residual autocorrelations, VAR residual serial correlation LM tests, and variance decomposition of manufacturing employment (Table A5.7–5.9, Figure A5.3 and A5.4). For all IRFs see Table A5.5 in the Appendix section.

5.2.4. The spending effect

Compared with the equations for the resource movement effect, the estimated models for the spending effect yielded higher R-squared values, statistically significant F-statistics, and normally distributed and homoscedastic residuals (see Table 5.24; excluding Eq. 36, which has serial correlation).

MPC, population income in USD, and government spending in billions of USD and as a percentage of GDP had positive and statistically significant relationships with CPI growth rates. Moreover, non-tradeable output had a negative relationship with CPI (see Eqs. 33 and 34). In addition, both the REER and the NEER were significantly positively related to the income of the population in USD. However, government spending was negatively related to the REER and the NEER.

Table 5.24: Spending effect of Dutch Disease in Azerbaijan's Economy for 2000–2018.

	Dependent variable					
	CPI-GR		**REER-GR**		**NEER-GR**	
Exp.var.	(33)	(34)	(35)	(36)	(37)	(38)
Intercept	−0.23	−0.40	−0.01	0.15	−0.17	−0.02
	[−0.27]	[−0.24]	[−0.01]	[0.07]	[−0.07]	[−0.01]
MPC	**0.11*** **	**0.09***	0.01	0.04	0.06	0.08
	[5.13]	[2.17]	[0.34]	[0.78]	[1.02]	[1.32]
S_{NT} output	**−1.07*** **	**−1.26*** **	−0.05	0.04	−0.18	−0.07
	[−7.61]	[−4.83]	[−0.15]	[0.11]	[−0.45]	[−0.17]
Population income in USD	**0.67*** **	**1.35*** **	**1.00** **	0.50	**1.00** **	0.48
	[4.18]	[4.91]	[2.49]	[1.42]	[2.18]	[1.14]
Gov. spen. – billions USD	**0.48*** **		**−0.32** **		**−0.34***	
	[8.64]		[−2.31]		[−2.17]	
Gov. spen. – % share of GDP		**0.30** **		**−0.34** **		**−0.31***
		[2.91]		[−2.61]		[−1.96]
R^2	0.91	0.67	0.63	0.65	0.51	0.49
Adj. R^2	0.88	0.56	0.51	0.54	0.35	0.32
Obs.	17	17	17	17	17	17
F-stat.	30.0	6.18	5.16	5.70	3.11	2.87
Prob(F-stat)	0.00	0.01	0.01	0.01	0.06	0.07
Het. $_{F\ stat}$	0.41	0.27	0.35	0.56	0.29	0.47
	[0.82]	[0.98]	[0.97]	[0.94]	[0.97]	[0.68]
JB_N	3.24	1.23	1.57	1.47	3.31	2.26
	[0.20]	[0.54]	[0.45]	[0.48]	[0.19]	[0.32]
LM test	1.03	1.23	1.70	2.86	2.33	2.55
	[0.23]	[0.17]	[0.10]	[0.04]	[0.06]	[0.05]

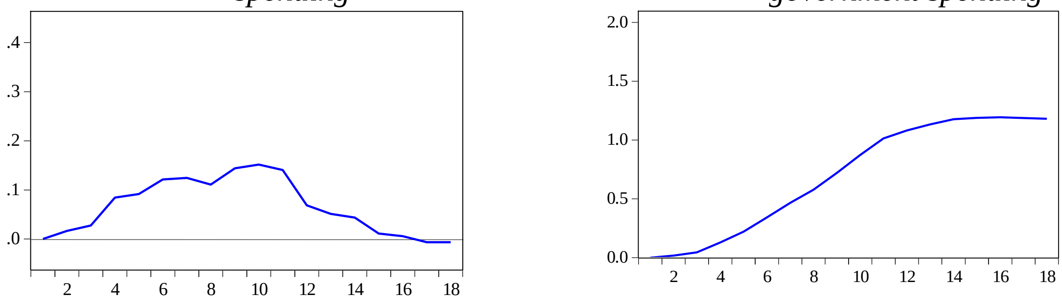
Source: The author's own calculations based on the collected data.
Notes: 1) CPI means consumer price index, REER denotes real effective exchange rate, and NEER means nominal effective exchange rate; 2) GR denotes growth rates; 3) MPC is the marginal propensity to consume; 3) Gov. spen. means government spending; 4) the bold coefficients highlight the significant results; 5) *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively; 6) values in brackets are the corresponding *t*-statistics; 7) the figures were rounded to the second decimal place for compactness; 8) Het. $_{F\ stat}$ denotes the heteroscedasticity test based on the Breusch–Pagan–Godfrey method, JB_N denotes the Jaque–Bera normality test results, and LM test denotes the Lagrange multiplier test for serial correlation. The values in brackets indicate *p* values.

Lastly, a more thorough analysis of the spending effect using the BVAR model revealed that the CPI positively responded to government spending over a 15-month period (see Figure 5.9, panel a). The cumulative responses of the CPI to government spending also indicated a strong positive association between government spending shocks and the CPI (see Figure 5.9, panel *b*). The BVAR model that captured the spending effect of DD in Azerbaijan's economy was stable and passed all diagnostic and stability tests (see Appendix, Figure A5.6 and A5.7 for results of AR root plots and residual correlograms, respectively and Table A5.10 for variance decomposition). Long-term modeling between the CPI and government spending could not be performed because the sample size was small and the data had no cointegration relationship.

Figure 5.9: Impulse response functions of the CPI used in the Bayesian VAR model.

a. Responses of CPI to government spending

b. Accumulated responses of CPI to government spending



Source: The author's own calculations based on the collected data.
Notes: 1) Response to Cholesky one S.D. Innovations ± 2 S.E.

5.2.5. Summary of the section

The results of this study were consistent with the dictionary definition of DD syndrome. As seen above, the REER in Azerbaijan's economy increased in parallel with the increase in international oil prices between 1995M01 and 2020M12. This result was obtained using methods such as VAR, FMOLS, and CCR. The increase in REER negatively affected manufacturing output and value-added as well as agriculture (so-called lagging sectors in DD theory). All of this was observed in the context of increasing dependence on the oil industry and prices measured by the EDI. In other words, manufacturing and agriculture value-added, as well as manufacturing value-added, were negatively affected by increasing oil dependence. In parallel, the higher the EDI, output and employment in the booming sectors increased significantly. Surprisingly, employment in the lagging sectors also exhibited a significantly positive relationship with the EDI; however, employment in the non-tradeable sectors was negatively affected by the EDI. This could indicate the impact of subsidies (based on oil revenues) on non-oil employment in the case of lagging sectors. However, the negative coefficients for non-tradeable sectors prompted the author to further examine the relevance of the spending effect of DD, since the expected relationship between employment in the non-tradeable sectors and the EDI was positive.

Oil prices were statistically significant when the REER was used in a model instead of the NEER. This indicated the ability of inflation effects in Azerbaijan’s economy to reflect initial DD signs and symptoms. In other words, it means that oil prices and other related variables more accurately predict the sectoral effects of the aforementioned variables when inflation effects are removed from the exchange rate indicator. Put differently, inflationary effects mask the worsening negative impact of the oil boom on the non-oil sectors. This leads to unsustainable economic growth and development; that is, there is oil-driven growth, but non-oil sectors are crowded out of the economy.

DD theory does not require the effects of DD-related variables on exports from booming and lagging sectors to be tested; however, out of curiosity, this study tested this nexus. As expected, oil dependence, the REER, and oil rents had a negative impact on non-oil exports, whereas the opposite occurred for the booming sectors. Surprisingly, this was not the case during the oil boom, when oil prices had a positive impact on the non-oil sectors and a negative impact on the booming sectors.

The export volumes of the oil and gas industry in Azerbaijan are regulated by international treaties and agreements. An interesting interpretation of the positive impact of oil prices on non-oil exports is to attribute it to the economic characteristics of the main trading partners. The main international buyers of non-oil products from Azerbaijan are also oil-rich countries, whose purchasing power increases when oil prices spike. Chubrik and Walewski (2010) first argued that Azerbaijan exports non-oil products mainly to Russia, where falling oil prices reduce domestic demand for imported goods. Consequently, when oil prices increase in Russia, demand for Azerbaijani non-oil products also increases, creating a positive relationship.

In terms of resource movement and spending effects of DD in Azerbaijan's economy between 2000 and 2019, the following can be noted: There is evidence both for and against the resource movement effect. The growth rates of output and employment of S_B did not cause statistically significant deteriorations of S_L or S_{NT}. However, the growth rates of output and employment in S_{NT} had a significantly negative effect on the employment dynamics in S_L. This suggests the outcome of the indirect de-industrialization of the resource movement effect. The proxy variables for domestic demand—income in AZN and USD—also exhibited positive effects on the output growth rates in each sector, but employment growth rates declined in S_L and S_{NT} when domestic demand increased. The estimated standard unrestricted VAR model revealed that the REER, oil prices, and service sector jobs all had negative effects on manufacturing jobs.

The test of the spending effect demonstrated that higher population income, MPC, and government spending were associated with higher levels of CPI. Moreover, the CPI responded positively to shocks in state budget spending during the 16 months covered by the BVAR model. However, the OLS approach based on annual data was unable to capture the expected nexus between DD-related variables and the REER and NEER. More advanced and country-specific linear modeling techniques may be able to capture the spending effect of DD in the case of Azerbaijan's economy.

5.3. Oil-Led De-Industrialization of Non-Oil Manufacturing in Azerbaijan's Economy: An Analysis of the Chemical Industry

In this chapter, Azerbaijan's economy is studied from a de-industrialization point of view, which seems to be the result of DD syndrome. While the NRC and DD have been studied in the case of Azerbaijan's economy, the de-industrialization of certain non-oil subsectors has been largely ignored as a separate analysis. As a result, little is known about the possible reasons for the production collapse in the tradeable non-oil sectors after 2005 and 2006 (i.e., the beginning of the oil boom). The chemical industry is a good example of a non-oil manufacturing sector to study because, although it has accounted for most of Azerbaijan's non-oil exports since 1991, some of its branches have ceased production while others have grown since the transition period.[105]

The NRC and DD theories were discussed in the previous chapter, and the results suggested that the NRC and DD can be found in Azerbaijan's economy. According to these theories, the negative effects of the oil boom could lead to the de-industrialization of some non-oil manufacturing sectors. Identifying de-industrialization in specific subsectors would enable the design of more robust policies for addressing industrial policy challenges. Thus, unsustainable economic growth in Azerbaijan could be transformed into more sustainable, long-term economic development. Therefore, the contribution of this study is to fill the gap in the current documentation on the de-industrialization patterns of non-oil manufacturing sectors. Both quantitative and qualitative research methods were applied in this study. The results presented later in this chapter clearly demonstrate the oil-led de-industrialization of certain chemical subsectors in Azerbaijan's economy, such as chlorine and soda (liquid and caustic).

5.3.1. Descriptive analysis

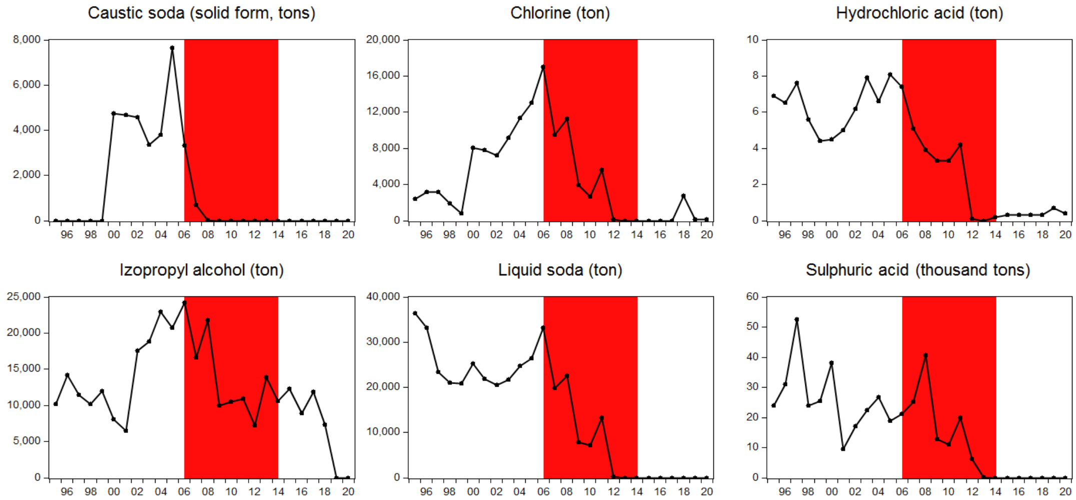
The SSCRA provides production data in a natural form (i.e., in thousands of tons) for specific subsectors of the chemical industry. To understand which specific subsectors were affected by the presumed negative impact of the oil boom on Azerbaijan's economy, a brief figure analysis was first required. Figures 5.1 and 5.2 present the subsectors that experienced a decline in production during the oil boom as well as those that did not but either fluctuated or developed. An analysis of the data in Figure 5.1 revealed that six subsectors—caustic soda, chlorine, hydrochloric acid, isopropyl alcohol, liquid soda, and sulfuric acid—experienced production declines that overlapped with the start of the oil boom in 2005–06. In addition, caustic soda production began in 2000, lasted only seven to eight years, and has not been significant since 2009.

The subsectors in Figure 5.1 are closely related. For example, the most popular industrial technique for producing chlorine is to combine cooking salt and sulfuric acid to transform hydrochloric acid into chlorine (Kragh 2017). A decline in demand for

[105] The other non-oil tradeable sectors, such as textiles and machinery, were also considered for the analysis here. However, the textile industry does not show any consistent and systematic output collapses, but rather fluctuations. Machinery production almost completely collapsed following the breaking of Soviet Union. Even some machinery subsectors, such as the production of information technologies, have been industrialized. Therefore, only the chemicals industry in Azerbaijan can scientifically be analyzed against oil-led de-industrialization.

chlorine or a disruption in production capacity could also have led to a collapse in demand for hydrochloric acid and sulfuric acid. Furthermore, liquid soda and caustic soda are typical feedstocks for soap and detergents. Isopropyl alcohol is also a major ingredient in numerous cosmetics, hand lotions, antiseptics, and medicines. It is also used to convert ethanol (ethyl alcohol) into a less harmful form. Whatever causes the breakdown of one can also cause the collapse of the other (i.e., the domino effect).

Figure 5.10: Subsectors of the chemical industry that experienced output de-industrialization for 1995–2020.



Source: SSCRA (2022)
Notes: The red shaded areas denote the oil boom period in Azerbaijan between 2006 and 2020.

As Figure 5.2 indicates, certain subsectors of the chemical industry did not experience significant and continuous declines in production during the oil boom. For example, as barium sulfate is used extensively in oil and gas production and in the paint and construction industries (Choudhury–Cary 2001), domestic demand was high and production developed positively between 2000 and 2020. For bitumen, production was also consistently positive between 2000 and 2020, with the exception of 2013 and 2014. In 2013 and 2014, several reconstruction works occurred at the State Oil Refinery, where bitumen is produced (Azertag 2013).[106] The main reason for the strong development of bitumen in Azerbaijan could be associated with renovation works in 2000; at that time, the Austrian company Parner and the US-based company Perfokart used Biturox technology to improve the quality of bitumen production (Abbasov et al. 2015). This helped to meet international standards and improve export potential.

[106] Repair work carried out at bitumen production facility No. 401 (Azertag 2013).

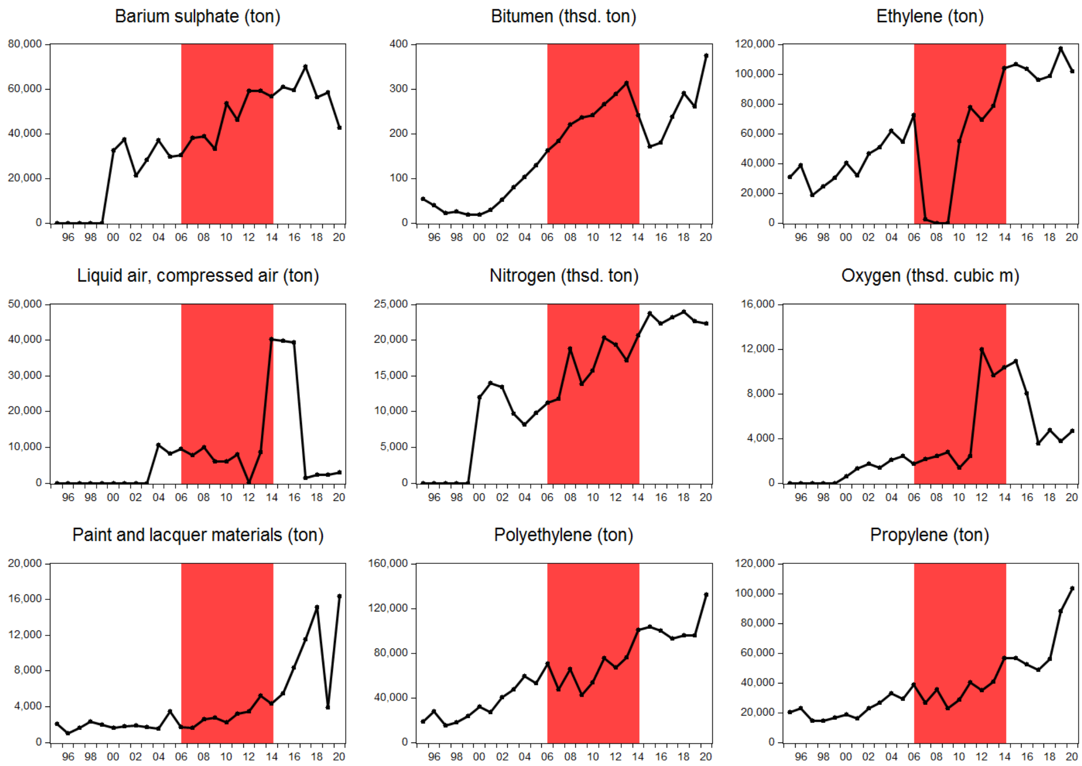
Moreover, ethylene production exhibited a positive trend between 1995 and 2006 but slumped between 2007 and 2009. After the merger with Azerikimya PU—a unit of SOCAR—ethylene production recovered rapidly in 2010. Overall, ethylene, polyethylene, and propylene production recovered quickly from the energy and raw material crises of the 1990s due to the purchase of a $95-million state-guaranteed steam-generator complex from Japan. This will be remembered as one of President Haydar Aliyev's greatest contributions to the country's petrochemical industry (Trend News Agency 2015). Ethylene production was brought online with project capacity, production was increased, raw materials were saved, and balance losses were minimized, which helped to reduce production costs and increase profitability (Trend News Agency 2015).

The privately owned Baku Steel Company was the largest supplier of oxygen and nitrogen in Azerbaijan and played a crucial role in the metallurgical industry (Azertag 2014). Between 2011 and 2014, it spent $200 million to modernize oxygen and nitrogen production facilities to meet its own needs (Azertag 2014). A contract worth €15 million was signed with the French company Air Liquide, resulting in a modern 50-ton electric arc furnace and a furnace from German company Siemens VAI being installed (Azertag 2014).[107] Moreover, liquid air serves as an industrial source of oxygen and nitrogen, so the plants that produce oxygen and nitrogen most likely also produce liquid air for the air separation process. Finally, the increasing nitrogen production was due to a urea plant project implemented by SOCAR and the South Korean Samsung Engineering Co. This was possible due to the State Program on Food Security of the Population in Azerbaijan for 2008–2015 (Trend News Agency 2015).[108] All of these factors were reflected in the production levels of the selected subsectors, which did not record a continuous and significant decline in production, as indicated in the official statistics.

[107] Baku Steel Company also had equipment manufactured by leading companies in the United States, France, Italy, Turkey, India and other major countries. In addition, the number of nozzles increased by reconstructing a modern continuous casting unit manufactured by the Canadian company STEL-TEK.

[108] The Engineering, Procurement and Construction Agreement was signed between Samsung and Azerbaijani government. The construction of the plant with a daily production capacity of 1,200 tons of ammonia and 2,000 tons of granular urea was completed in 2019 (Trend News Agency 2015).

Figure 5.11: Subsectors of the chemical industry that did not experience output de-industrialization for 1995–2020.

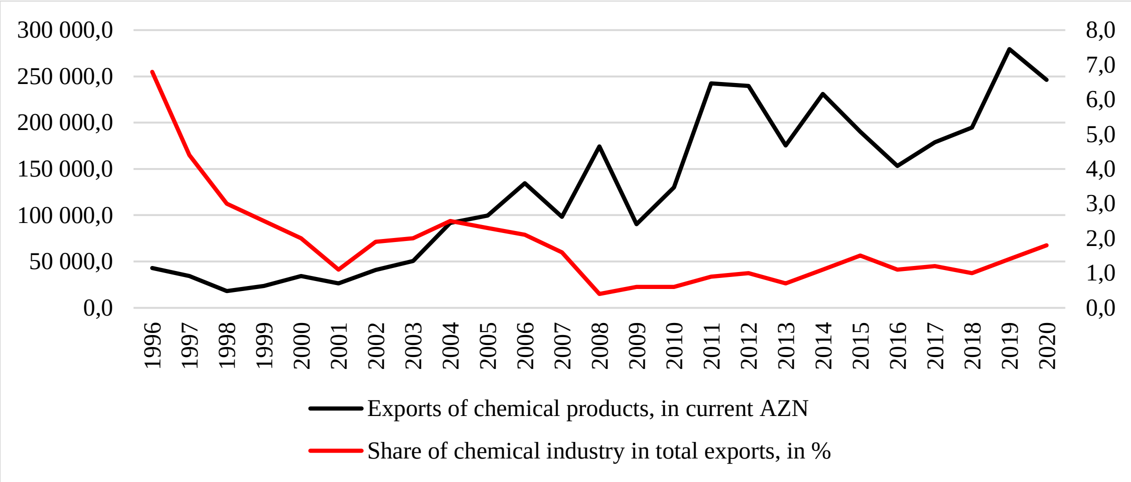


Source: SSCRA (2022)
Notes: The red shaded areas indicate the oil boom period in Azerbaijan between 2006 and 2020.

The production dynamics of the chemical industry depend on several factors, such as available domestic and foreign markets, the level of production forces, and domestic demand. Figure 5.12 indicates that chemical exports peaked in 2019, although the industry's share of total exports has declined. In the late 1990s, the chemical industry's share declined from 6.8% in 1996 to 1.1%, but the oil boom caused its share of total exports to decline even further to 0.4% in 2008. Nevertheless, chemical exports increased by up to 1.8% by 2020, mainly because the post-boom period brought lower oil exports.[109]

[109] For information on the specific subsectors of the chemicals industry that are not listed here, see Figure A5.10 and Figure A5.11 in the Appendix section.

Figure 5.12: Exports of the chemical industry (1996–2020).



Source: SSCRA (2022)

Moreover, the subsectors that experienced a slowdown at the beginning of the oil boom appeared to be more export-oriented than the so-called developed subsectors during the recovery or transition period (see Table 5.25). Both the trade value and share of total exports of the collapsed subsectors were high during the recovery period, with the exception of sulfuric acid and liquid soda. However, the developed subsectors had little or no share in total exports during the recovery period. Notably, their share increased during the oil boom period. Developed subsectors also belonged to the private sector (oxygen, nitrogen, and liquid air were produced mainly by the Baku Steel Company CJSC) and public–private partnerships (e.g., the production of ethylene polymers by SOCAR Polymer LLC). However, the plants for chlorine, soda, and other chemicals date back to the Soviet era and were unsuccessfully privatized in accordance with the 2001 presidential decree (Aliyev 2001). According to data from the Observatory of Economic Complexity (OEC), the so-called developed subsectors of the chemical industry had more diverse export destinations than the collapsed subsectors (see Table 5.25 for the two largest export destinations of each subsector). Thus, the impact of DD could be seen at the subsectoral level in the chemical industry, especially in subsectors that were more export-oriented at the beginning of independence.

Table 5.25: Trade value of subsectors of the chemical industry (in current USD) and share in total exports (in %) for 1997–2020.

Product	1996–2004	2005–2014	2015–2020	Main Export Destination
Collapsed subsectors				
Isopropyl alcohol	5,701,203 (14.1%)	13,541,105 (8.4%)	6,044,366 (2.9%)	Turkey and Russia
Caustic soda	1,034,192 (2.6%)	377,668 (0.9%)	503 (0.0%)	Georgia and Russia
Sulfuric acid	425,812 (1.1%)	1,064,373 (2.6%)	70 (0.0%)	Georgia
Chlorine	378,463 (0.9%)	55,622 (0.1%)	120 (0.0%)	Turkmenistan and Georgia
Liquid soda	254,024 (0.6%)	1,042,723 (2.6%)	1,521 (0.0%)	Georgia
Hydrochloric acid	58,973 (0.1%)	8,753 (0.0%)	1,212 (0.0%)	Turkmenistan and Georgia
Developed subsectors				
Oxygen	125 (0.0%)	2,824 (0.0%)	35,563 (0.1%)	Georgia and Kazakhstan
Nitrogen	207 (0.0%)	54,501 (0.1%)	11,679 (0.1%)	Georgia and the United Kingdom
Liquid air	1,279 (0.0%)	6,682 (0.0%)	56 (0.0%)	Georgia and Turkey
Paint products	437,691 (1.1%)	1,116,648 (2.8%)	2,408,672 (6.0%)	Georgia and Uzbekistan
Propylene	564,342 (1.4%)	12,963,562 (32.1%)	15,556,814 (28.6%)	Poland, Russia and Turkey
Bitumen	11,020,53 (2.7%)	4,808,735 (11.9%)	4,563,044 (11.3%)	Georgia and Turkey
Ethylene polymers	14,727,494 (36.5%)	63,133,566 (39.1%)	77,619,905 (37.5%)	Turkey and China

Source: The Observatory of Economic Complexity (OEC) and SSCRA

5.3.2. Econometric estimations

A stepwise regression analysis revealed that the oil boom period and the one-year lag of the REER negatively affected caustic soda production (see Table 5.26). While FMOLS supported these results, CCR did not capture statistical significance; however, the signs of the coefficients remained the same (see Models 1, 2, and 3). Model 4 retained the REER as an “essential variable”, and the algorithm continued to capture the oil boom as a statistically significant and negative determinant of caustic soda production. In addition, the stepwise algorithm included the service sector employment in Model 4. Models 5 and 6 produced long-run RLS results. They indicated that the significantly negative impact of the oil boom dropped in the long run, while the one-year lag of the REER maintained its statistical significance. These results were robust even after including employment in the service sector (see Model 6, Table 5.26).

Table 5.26: Regression results for the production of caustic soda (solid form) for 1995–2020.

Dependent Variable: Production of Caustic Soda (Solid)						
	(1)	(2)	(3)	(4)	(5)	(6)
	Stepwise + OLS	**FMOLS**	**CCR**	**Stepwise + OLS (REER)**	**Long-Run RLS of 1–3**	**Long-Run RLS of 4**
Constant	41.22	8.26	1.95	185.79	7804.67***	10519.42***
Oil Boom	−2211.86*	−1838.85*	−1585.74	−2072.13**	568.46	474.28
REER(−1)	−53.02	−37.48	−34.82	−54.26*	−66.22***	−47.50*
Services Emp.				−8.34		−4.06
R^2	0.24	0.23	0.22	0.28	0.26	0.31
Adj-R^2	0.17	0.16	0.14	0.18	0.19	0.21
Rw-squared					0.32	0.39
F-Stat	3.38*			2.70*		
DW	1.96			1.81		
AIC	17.62			17.64	19.69	22.54
Rn-squared stat.					8.77**	11.35***

Source: The author's own calculations based on the collected data.
Notes: 1) *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively; 2) the figures were rounded to the second decimal place for compactness; 3) in the stepwise regression process, the lag was set to 1 because the data set was yearly; 4) OLS stands for ordinary least squares; FMOLS stands for fully modified OLS; CCR stands for canonical cointegration regression; and RLS stands for robust least squares; 5) RLS was applied to level data containing outliers; 6) Model 4 employed the REER variable as an "essential" regressor; 6) Model 5 was an RLS estimation of Models 1–3; 7) Models 1–4 were short-run estimates, while Models 5 and 6 were long-run regression models; and 8) Rw-squared denotes residuals that were weighted and then squared.

From the results presented in Table 5.27, the oil boom appeared to have a significantly negative impact on chlorine production with a one-year lag (Models 1–3). However, in the long run, this relationship proved to be positive and statistically significant (see Model 6). Meanwhile, oil prices had a significantly positive impact on chlorine production in both the short- and long-run models. Including REER in the analysis revealed that it had a negative impact on chlorine production in both the short and long run. When service sector employment was included in the equation, a significantly negative relationship with chlorine production was observed.

Although the production of hydrochloric acid is closely related to that of chlorine, the analysis did not reveal statistically significant coefficients in the short run (see Table 5.28). However, among the long-run regressors, employment in the service sector had a significantly negative impact on the production level of hydrochloric acid. Furthermore, the inclusion of additional variables in Model 6, such as the REER, revealed many significant relationships. Together, the REER, one-year lag of the oil boom, and service sector employment have had a statistically significant impact on hydrochloric acid production—but only in the long run.

Table 5.27: Regression results for the production of chlorine for 1995–2020.

Dependent Variable: Production of Chlorine						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Stepwise + OLS	**FMOLS**	**CCR**	**Stepwise + OLS (REER)**	**Long-Run RLS of 1–3**	**Long-Run RLS of 4**
Constant	−203.53	−223.36	−222.28	208.91	5547.93**	51422.75***
Oil Boom(−1)	−4480.93**	−5048.18**	−5477.41*		1660.11	9522.98***
Oil prices	88.24**	83.07**	83.85*	96.54***	−40.33	75.34**
REER				−110.70*		−373.80***
Services Emp.				−23.35*		−14.10***
R^2	0.33	0.33	0.32	0.35	0.02	0.62
Adj-R^2	0.26	0.26	0.26	0.26	−0.06	0.55
Rw-squared					0.04	0.87
F-Stat	5.23**			3.82**		
DW	2.22			2.27		
AIC	18.85			18.52	42.46	41.73
Rn-squared stat.					0.44	81.43***

Source: The author's own calculations based on the collected data.
Notes: 1) *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively; 2) the figures were rounded to the second decimal place for compactness; 3) in the stepwise regression process, the lag was set to 1 because the data set was yearly; 4) OLS stands for ordinary least squares; FMOLS stands for fully modified OLS; CCR stands for canonical cointegration regression; and RLS stands for robust least squares; 5) RLS was applied to level data containing outliers; 6) Model 4 employed the REER variable as a "essential" regressor; 6) Model 5 is an RLS estimation of Models 1–3; 7) Models 1–4 were short-run estimates, while Models 5 and 6 were long-run regression models; and 8) Rw-squared denotes residuals that were weighted and then squared.

Table 5.28: Regression results for the production of hydrochloric acid for 1995–2020.

Dependent Variable: Production of Hydrochloric Acid						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Stepwise + OLS	**FMOLS**	**CCR**	**Stepwise + OLS (REER)**	**Long-Run RLS of 1–3**	**Long-Run RLS of 4**
Constant	−0.14	−0.26	−0.30	−0.15	20.48***	27.18***
Oil Boom(−1)	−1.03	−1.33	−1.70	−1.12	0.12	2.92***
Services Emp.	−0.01	−0.01	0.01	−0.01	−0.01***	−0.12***
REER				0.01		−0.10***
R^2	0.11	0.08	0.03	0.11	0.64	0.76
Adj-R^2	0.02	−0.02	−0.01	−0.2	0.61	0.72
Rw-squared					0.69	0.82
F-Stat	1.32			0.84		
DW	2.13			2.13		
AIC	3.46			3.54		22.92
Rn-squared stst.					38.93***	73.51***

Source: The author's own calculations based on the collected data.
Notes: 1) *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively; 2) the figures were rounded to the second decimal place for compactness; 3) in the stepwise regression process, the lag was set to 1 because the data set was yearly; 4) OLS stands for ordinary least squares; FMOLS stands for fully modified OLS; CCR stands for canonical cointegration regression; and RLS stands for robust least squares; 5) RLS was applied to level data containing outliers; 6) Model 4 employed the REER variable as an "essential" regressor; 6) Model 5 was an RLS estimation of Models 1–3; 7) Models 1–4 were short-run estimates, while Models 5–6 were long-run regression models; and 8) Rw-squared denotes residuals that were weighted and then squared.

The picture for isopropyl alcohol was similar to that for hydrochloric acid production; that is, only one significant short-run relationship existed between oil prices and isopropyl alcohol production (see Table 5.29). This relationship was positive and only captured using FMOLS. Moreover, in the short run, the inclusion of the REER did not change the picture for isopropyl alcohol (see Model 4); however, in the long run, oil prices had a negative impact on this subsector with a one-year lag (Model 5). In the long-run model, represented by Model 6, no statistically significant results were obtained.

Table 5.29: Regression results for the production of isopropyl alcohol for 1995–2020.

Dependent Variable: Production of Isopropyl Alcohol						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Stepwise + OLS	**FMOLS**	**CCR**	**Stepwise + OLS (REER)**	**Long-Run RLS of 1–3**	**Long-Run RLS of 4**
Constant	−491.22	−476.62	−504.00	−463.35	13061.93***	23390.85**
Oil prices	80.70	90.92*	229.04	74.77	115.78	116.79
Oil prices (−1)	−87.88	−85.68	−218.52	−80.69	−131.22*	−67.57
REER				−47.28		−131.76
R^2	0.16	0.16	−0.29	0.16	0.12	0.14
Adj-R^2	0.08	0.07	−0.42	0.04	0.04	0.02
Rw-squared					0.14	0.17
F-Stat	1.97			1.33		
DW	2.54			2.55		
AIC	19.89			19.97	20.14	24.02
Rn-squared stat.					2.82	3.52

Source: The author's own calculations based on the collected data.
Notes: 1) *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively; 2) the figures were rounded to the second decimal place for compactness; 3) in the stepwise regression process, the lag was set to 1 because the data set was yearly; 4) OLS stands for ordinary least squares; FMOLS stands for fully modified OLS; CCR stands for canonical cointegration regression; and RLS stands for robust least squares; 5) RLS was applied to level data containing outliers; 6) Model 4 employed the REER variable as an "essential" regressor; 6) Model 5 was an RLS estimation of Models 1–3; 7) Models 1–4 were short-run estimates, while Models 5 and 6 were long-run regression models; and 8) Rw-squared denotes residuals that were weighted and then squared.

The analysis of liquid soda demonstrated that, in the short run, oil prices positively and statistically significantly affected production (see Table 5.30, Models 1–3). In the long run, however, this relationship was reversed, as indicated by Model 5. Moreover, the oil boom period had a significantly negative effect on liquid soda production in the short run. This relationship disappeared in the long run, as captured by Model 6, becoming nonsignificant but positive. The inclusion of the REER in the regression equations was fruitful, as Models 4 and 6 produced statistically significant results. Model 4 implied a negative short-run relationship while Model 6 implied a long-run negative relationship between the REER and liquid soda production. Service sector employment also had a negative long-run effect on liquid soda production.

Table 5.30: Regression results for the production of liquid soda for 1995–2020.

Dependent Variable: Production of Liquid Soda						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Stepwise + OLS	**FMOLS**	**CCR**	**Stepwise + OLS (REER)**	**Long-Run RLS of 1–3**	**Long-Run RLS of 4**
Constant	−1511.25	−1192.62	−1196.47	−1834.85*	28579.04***	9963.40***
Oil prices	145.01**	137.05**	137.86*	157.37**	−351.86***	98.42
Oil boom (−1)	−7816.93**	−8905.02**	−9696.47**		12465.14	
REER				−226.15**		−211.11*
Services Emp. (−1)				34.52		−63.08***
R^2	0.31	0.34	0.33	0.35	0.30	0.70
Adj-R^2	0.25	0.27	0.26	0.26	0.24	0.65
Rw-squared stat.					0.39	0.78
F-Stat	4.81			3.64**		
DW	2.13			2.63		
AIC	19.98			20.00	35.16	28.70
Rn-squared stat.					8.93**	55.21***

Source: The author's own calculations based on the collected data.
Notes: 1) *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively; 2) the figures were rounded to the second decimal place for compactness; 3) in the stepwise regression process, the lag was set to 1 because the data set was yearly; 4) OLS stands for ordinary least squares; FMOLS stands for fully modified OLS; CCR stands for canonical cointegration regression; and RLS stands for robust least squares; 5) RLS was applied to level data containing outliers; 6) Model 4 employed the REER variable as an "essential" regressor; 6) Model 5 was an RLS estimation of Models 1–3; 7) Models 1–4 were short-run estimates, while Models 5 and 6 were long-run regression models; and 8) Rw-squared denotes residuals that were weighted and then squared.

Table 5.31: Regression results for sulfuric acid for 1995–2020.

Dependent Variable: Production of Sulfuric Acid						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Stepwise + OLS	**FMOLS**	**CCR**	**Stepwise + OLS (REER)**	**Long-Run RLS of 1–3**	**Long-Run RLS of 4**
Constant	−1.25	−2.38	−2.33	−2.12	26.38***	101.98***
Oil prices	0.30**	0.27***	0.17	0.31**	0.21	0.15
Oil prices (−1)	−0.16	−0.17*	−0.08		−0.41***	−0.03
REER				−0.17		−0.16
Services Emp.				0.05		−0.07***
R^2	0.20	0.25	0.20	0.21	0.33	0.56
Adj-R^2	0.13	0.17	0.12	0.10	0.27	0.48
Rw-squared					0.43	0.75
F-Stat	2.65***			1.75		
DW	2.47			2.30		
AIC	7.90			7.98	33.04	37.49
Rn-squared stat.					10.85***	37.47***

Source: The author's own calculations based on the collected data.
Notes: 1) *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively; 2) the figures were rounded to the second decimal place for compactness; 3) in the stepwise regression process, the lag was set to 1 because the data set was yearly; 4) OLS stands for ordinary least squares; FMOLS stands for fully modified OLS; CCR stands for canonical cointegration regression; and RLS stands for robust least squares; 5) RLS was applied to level data containing outliers; 6) Model 4 employed the REER variable as an "essential" regressor; 6) Model 5 was an RLS estimation of Models 1–3; 7) Models 1–4 were short-run estimates, while Models 5 and 6 were long-run regression models; and 8) Rw-squared denotes residuals that were weighted and then squared.

Notably, sulfuric acid production could be explained by oil prices and their one-year lag, as demonstrated by the stepwise/OLS results in Model 1. Here, oil prices had a positive and statistically significant impact (see Table 5.31). This result was confirmed by FMOLS but not by CCR. Moreover, the one-year lag in oil prices had a significantly negative effect on sulfuric acid production, which was captured in Model 2. The sign was nonsignificant in Models 1 and 3. In Model 4, in which the REER was retained as an "essential" regressor, the one-year lag of oil prices dropped and only the non-lagged oil prices retained their position. However, the sign of the REER was negative but nonsignificant. In the long-run versions of Models 1–3, the non-lagged oil prices lost their statistical significance but, noteworthily, the lagged oil prices became statistically significant. The long-run estimate in Model 4 revealed the only negative effect by service sector employment.

5.3.3. Results of the qualitative data analysis

This section presents the analysis of the expert interviews based on the main themes that emerged from the questions. The themes include the first years of Soviet technology integration, competitiveness, exchange rate, etc. For each topic, there are subsections that mainly separate the opinions of the chemical industry experts from those of the economists to provide a more concise statement. In addition, the main ideas and results summarized based on the experts' opinions have been assigned the codes listed in Table 5.1 at the end of the sentences.

5.3.3.1. Early years and integration of Soviet technology into the chemical industry

Everything collapsed in the early years of the transition period, leading to complete chaos and disruption to the export and import patterns of the chemical industry (NN7, RG6, IE2, EA1, ISH8). Underinvestment and government neglect led to a decline in production and shutdowns in both the oil and chemical industries (NN7, MH1, IE2, EA1, ISH8). Problems related to the logistics of energy sources and inputs in the chemical industry brought the production process based on old Soviet technology to a halt (MH1). The development of the oil industry was a higher priority for the Azerbaijani government than non-oil manufacturing sectors, including the chemical industry (TG1). Nevertheless, Soviet technologies continued to be part of the production process—some were renovated and modernized, while others were used in their old form—such as the steam cracker in Azerkimya PU. However, industry experts evaluated the inherited Soviet technology as physically and functionally obsolete, environmentally harmful, and economically inefficient (AB6, OA9).

5.3.3.2. Recent developments in the chemical industry

Between 2015 and 2019, there were many new developments in the chemical industry. SOCAR Polymer and SOCAR Carbamide were opened (MH4). Ethylene and polyethylene production facilities at Azerikimya PU were renovated. Furthermore, six of 14 production units were installed and the bitumen production plant at Heydar Aliyev Oil Refinery was renovated (RG6, IE2, MH4). Recent developments and upcoming events in the industry also include the opening of new production facilities for sulfuric acid, natural gas processing, and diesel fuel to EURO 5 standards (NN7, GR6). All of this indicates an increasing trend in domestic production and exports in the industry. The reasons for the positive development of the chemical industry in recent years are well known, and include a developed oil and gas sector and investments in chemicals due to oil revenues. However, the key factors responsible for the collapsed subsectors and unsustained production of certain chemicals (e.g., soda and chlorine) have not yet been studied at the desired level.

5.3.3.3. Exchange rate

Industry experts

Determining the role and importance of the exchange rate for the chemical industry was the largest challenge, as experts who are not in management generally do not know much about this subject. While the currently working industry experts agreed on the importance of the exchange rate for the industry (OA9, NN7, TG1), former experts were unable identify a clear link between the exchange rate or the value of the manat (AZN) and chemical industry exports (AB6, EA1). Instead of the impact of the exchange rate on the industry, the former industry specialists talked about the importance of prices in world chemical markets, since a small producer like Azerbaijan is a price taker rather than a price setter (AB6). In addition, industry experts highlighted that the chemical industry does not import raw materials from abroad, which can be affected by the exchange rate (NN7, IE). Long-term effects, of course, are observed from time to time when factories are modernized and repaired by foreign specialists (IE2). In this case, payments are made in foreign currencies such as the USD. One interviewee commented on the government's troubling policy when the AZN appreciated against other currencies between 2013 and 2014. In his opinion, the government was more interested in extracting and exporting crude oil than in building a production plant for pharmaceutical or similar chemical products (TG1). Moreover, it is not only the exchange rate of the AZN against the USD that matters, but also that against the Russian ruble, as some production facilities establish bilateral and extensive ties with Russia (TG1). Nevertheless, the devaluation of the national currency in 2015 demonstrated that the willingness of buyers to purchase chemical industry products manufactured in Azerbaijan is very high (EA1). The excessive appreciation of the AZN against the currencies of major trading partners between 2005 and 2014 probably had a discouraging effect on chemical exports (EA1).

Economists

The economists unanimously noted that exchange rate policy—and more generally monetary policy—is one of the most problematic elements in the development of the non-oil sectors in Azerbaijan. Formally, a monetary policy exists, but the exchange rate system of the economy does not reflect the country's economic realities, making it restrictive and unpredictable despite being fixed (IA3).[110] A fixed exchange rate system is a major burden on the economy (IA3). This regime mainly protects companies in Azerbaijan's extractive industries, which generate huge oil revenues, and the government is mainly interested in maintaining the status quo (GI1). Thus, prior to ensuring an exchange rate that supports non-oil development, a non-oil development strategy should be formulated (AM2, IA3, GI1). Since the oil boom period, Azerbaijan's exchange rate policy has supported imports rather than exports (GI1). Indeed, the problems associated with exchange rate policy discourage investment (GI1). The following two interview excerpts illustrate this point:

> *I refer to currency liberalization. Administrative regulation of the exchange rate is unattractive to investors. They know that the state can make a sudden devaluation, as in 2015, and they can lose their investments or profits overnight. This policy is tied to a political decision, which discourages investors to some extent. (GB1)*

> *The government failed with its exchange rate policy. This led to high interest rates and high rates of return for some wealthy strata of society. This hindered the ability of businesses to obtain credit. (AM2)*

---

[110] It is fixed, but the government can change it whenever it wants.

Although one interviewee mentioned that the exchange rate should not serve the purpose of industrialization of the country (SB5), the others argued that industrialization requires an appropriate exchange rate policy (EB6, AM2, GB1, IA3). Such a policy should be a free-floating exchange rate regime, and the central bank should intervene only when necessary (EB6). This could minimize Azerbaijan's vulnerability to commodity prices and improve the government's responsiveness to international business cycles (EB6). However, instead of implementing reforms and changes, the government seems to be relaxed due to rising oil prices and the AZN strengthening again, which could put it in the same position as an overvalued currency during the oil boom (AM2).

5.3.3.4. Competitiveness

Industry experts

In general, the competitiveness of the chemical industry is high due to high quality and low prices. The polymers, coke, diesel fuel, paint lacquer materials, and carbamide subsectors produce high-quality products that are exported abroad (MH4, RG6). The raw materials can be used to produce 99.9% ethylene. This also reflects the productivity and high quality of these subsectors (IE2). However, subsectors such as ethylene and polypropylene are not considered competitive, and they are mainly focused on domestic markets as they are not profitable enough in foreign markets (AB6, IE2). Although Azerbaijan's paint and lacquer products are exported to more than seven countries, neighboring countries such as Turkey and Iran seriously challenge the competitiveness of this subsector. They have a more favorable geographical location, which reduces their logistical challenges, as well as a wide range of opportunities in terms of access to raw materials (OA9). Meanwhile, Azerbaijani paint production is highly competitive in the domestic market, as foreign brands are expensive and exceed the purchasing power of many consumers (OA9).

> *Imported goods are no better than domestically produced chemicals. All domestically produced goods meet international standards and norms. (NN7)*

As a rule, the failure of domestic competitiveness will also lead to a collapse of production in the chemical industry, as a subsector quickly becomes unprofitable (OA9). The key factor in the competitiveness of the chemical industry is raw material (input) prices. The Azerbaijani government tends to promote extractive industries when oil and natural gas prices are high, neglecting non-oil processing industries (NN7). Economic barriers to entry exist in the chemical industry due to already established brands, which significantly limits companies' competitiveness (TG1). Therefore, Azerbaijani chemicals compete only in the lowest segments of foreign markets (TG1). However, the expert working in the industry's private sector noted that transportation costs are more challenging than production costs in the current economy (OA9).

Economists

The reasons for the low competitiveness of the non-oil manufacturing and chemical industry can largely be attributed to the increased signs of DD during the oil boom period (IA3). Imports became cheaper, raw materials were scarce, and technology was outdated (EB6, AM2). Production costs increased due to domestic inflationary pressures and exchange rate appreciation, which reduced the country's remaining export potential, delaying industrialization; now, in 10–15 years, being competitive will be even more difficult because numerous companies already occupy markets in the chemical industry (GI1). Because of the aforementioned factors, it is difficult to promote Azerbaijan's non-oil products as innovative, and the state's large role in the chemical industry makes it even more problematic (GI1). This is because the main producers are SOEs and there is usually only one company that produces a certain chemical in the country. Thus, companies cannot gain experience in competition (GI1). Put differently, without sector-wide competition, the necessary knowledge and skills will not emerge to support the positive spillover effects that manufacturing normally generates (AM2). Moreover, the current competitiveness of Azerbaijan's economy discourages high levels of FDI (EB6).

5.3.3.5. Labor

In DD syndrome, part of the resource movement effect involves the movement of labor out of manufacturing when either the booming sector or tertiary sectors become more attractive than lagging sectors (Corden-Neary 1982; Corden 1984). While engineers or managers may change company, engineers in the chemical sector are generally very loyal to the industry (MH4, IE2). However, if health and safety standards are unacceptable, an exodus of workers from the industry may occur (TG1). Overall, the movement of labor out of chemicals is difficult because the majority of workers are engineers and chemical specialists; thus, their skills are not easily transferable to other occupations (MH4).

Some respondents expressed despair about the current situation of education and training in the industry for supporting production and innovation processes (NN7, TG1). In other words, in the labor market, a shortage exists of workers with adequate knowledge and skills to work in chemical production facilities (TG1). The median age of engineers currently managing chemical production in plants is 45 years (TG1). This indicates a gap in the recruitment of young professionals for production plants. Considering these factors, the lack of research and development (R&D), experimentation, and motivation, as well as weak university–industry connections, are challenges for production in Azerbaijan's chemical industry (NN7, TG1, IE2).

It should come as no surprise that the government's targeted initiatives for the chemical industry were conceived only after the sharp price slumps in international commodity markets in 2014 (IE2). However, if economic diversification of industrial production, particularly in the chemical industry, had begun earlier in Azerbaijan, it would have resulted in a strong domestic labor force through training and employment (Jonnard et al. 1985). This was already part of the social policy of many developing energy-rich countries in their attempts to develop their chemical and petrochemical industries (Jonnard et al. 1985).

5.3.3.6. Oil industry

The oil industry in Azerbaijan is linked to the chemical sector in a complex and direct manner (MH1). Specifically, oil production provides inputs and oil prices determine the production levels in many chemical subsectors (TG1). The most important link between chemicals and the oil industry is through the price of oil products, since these prices determine the prices of energy sources (MH1). If oil prices rise, production costs in the chemical sector will increase; if oil prices fall, the opposite is true (MH1). When oil prices rise globally, this negatively impacts the chemical industry's production, as when prices are higher, manufacturing plants buy less oil and natural gas as inputs for the production of tires, for example (TG1). In Azerbaijan, when oil prices rise, the government is motivated to sell crude oil rather than chemicals to achieve expected profits (TG1, IE2). However, the picture in the country is mixed because the development of the chemical industry as a non-oil sector can be both positively and negatively affected by oil prices (IE2). This is because SOCAR's revenues increase when oil prices increase, and SOCAR uses part of these revenues to invest in and expand its chemical plants (IE2). This scenario is common in energy-rich countries, where oil exports provide the funds for investment in non-energy sectors (Jonnard et al. 1985). Meanwhile, technical aspects of the production of certain chemicals in Azerbaijan are not dependent on oil prices as they are regulated by the state and remain more or less fixed (IE2, MH4).

> *Methane can be used, for example, to produce various chemicals. However, due to high demand, it is now more profitable to export it in its raw form than to use it to produce chemicals. For this reason, the price of oil significantly determines the correlation between the production of the chemical industry and the source of raw materials such as natural gas. (NN7)*

One thing is certain, however. The Azerbaijani government is interested in developing non-oil sectors only when oil prices fall (IE2). This is not a uniquely Azerbaijani practice. Jonnard et al. (1985) discussed the increased motivation of oil-rich developing countries to promote their own chemical industries when crude oil became less profitable after the supercycle of oil prices (1973–74 and 1979–80).

5.3.3.7. Collapsed subsectors

Industry experts cited various reasons for the collapse of certain chemical industry subsectors after 2005–06. Some pointed to outdated, poor, and even dangerous Soviet technology that had not been upgraded to meet economic, environmental, and safety requirements (RG6, OA9, MH1, ISH8). Others referred to economic and institutional reasons, such as decreased profitability (AB6), a lack of competitiveness with imported chemical products (NN7), decreased demand (IE2, NN7), and disappearing support from the Ministry of Economy at the beginning of the oil boom (EA1). If the economic reasons for producing goods in a particular subsector are unfavorable and one or two producers leave, then many will follow (TG1). TG1 also expressed an interesting idea: Most of the collapsed subsectors should have been demanded by universities and research laboratories because they produce acids and solvents. That is, the products are widely used in laboratory research to create chemical environments under laboratory conditions. This demonstrates that R&D in Azerbaijan's chemical industry is in a poor state (TG1).

To highlight specific subsectors, chlorine and hydrochloric acid production collapsed due to no domestic demand, while the production technologies did not meet environmental requirements (AB6). Although official figures suggest that the production of isopropyl alcohol has declined sharply, experts in the field say that production is still ongoing (MH4) and is highly competitive (AB6).

Furthermore, an expert in the paint industry stated that it is cheaper to import soda from Iran than to produce it domestically (OA9). Caustic soda is also a common byproduct of chlorine production (EA1). Therefore, it is unsurprising that both liquid and solid soda production have declined sharply following the decline in chlorine production (EA1). Moreover, since the market is small for both consumers and producers, little opportunity exists to have an exclusive site for soda production (IE2). Demand for soda is low, while limited export opportunities and technological capacity make soda production unattractive (IE2). Nevertheless, some of the experts were optimistic about soda production. If it could be organized as an export-oriented industry, it could be successful (IE2).

Moreover, detergent production has slowed despite strong demand from households and producers (NN7). As detergent production is strongly linked to subsectors such as chlorine and hydrochloric acid, their total collapse affected the detergent business (IE2).

The years 2005 and 2006 were notable in statistical terms as well as in the quantitative analyses as since then, several subsectors (e.g., chlorine, hydrochloric acid, and caustic soda) have exhibited a highly significant downward trend. Three of the 10 industry experts interviewed were able to provide precise reasons for this decline. For example, AB6 stated the following:

> *The Azerbaijani economy underwent structural changes that began precisely in those years. The economy began to use more efficient technologies to produce competitive goods that could be sold on international markets. Therefore, these chemical goods (chlorine, hydrochloric acid, liquid soda, etc.) were no longer needed. (AB6)*

Other reasons included outdated equipment and machinery at factories, which did not produce much during those years (MH1) and received less government support (EA1). On the eve of the oil boom, government agencies such as the Ministry of Economy stopped supporting some industries, while the chemical industry was in dire need of government support (EA1). Furthermore, such support was virtually nonexistent as of 2005 (EA1). This situation changed after the sharp drop in commodity prices in 2014 (EA1).

However, due to the oil boom, Azerbaijan experienced not only de-industrialization but also forced de-industrialization, which is summarized in the following quote from one economist:

> *De-industrialization began immediately after the collapse of the Soviet Union. It was related to the nature of the production system, because during the years of the Soviet Union, the vast majority of the plants built were not focused on the domestic demand of the national economy [i.e., Azerbaijan]. The main focus was on Union-wide needs. There was no concept of a national economy. There was no concept of domestic industry or domestic production. For this reason, de-industrialization in the early years of independence was understandable. (AM2)*

In addition, the ideas expressed by the economists seemed to confirm the de-industrialization of non-oil sectors after 2005–06 (AM2, SB5, EB6). High oil revenues revitalized poverty-stricken society but did not help to boost domestic tradeable non-oil production because government policies failed (AM2). In other words, government officials were interested in sharing oil rents and their personal wealth (Ibadoghlu 2019). It was only the post-boom period—between 2014 and 2018—that brought sound decisions and policies from the state, but the implementation rate of these decisions was unsatisfactory (SB5). The fact that the state is interested in reforms and measures for strengthening the non-oil sectors only in certain periods confirms the relevance of the DD phenomenon. Of course, it cannot be stated that Azerbaijan had great potential in the non-oil manufacturing sectors in 2005–06 to re-industrialize the economy and reduce its dependence on oil (EB6). Therefore, years such as 2005 and 2006 and the following signs of DD should be considered one of the most critical factors for de-deindustrialization, not as a reason for the decline of production in some subsectors (IA3).

5.3.3.8. Developed subsectors

The industry experts cited various reasons for the development of the chemical industry’s subsectors, including the following: the availability of raw and feedstock materials (MH4, MH1, RG6), high demand (EA1, OA9, NN7), economic efficiency, profitability, economic and environmental adequacy (MH1), renovations (MH1), and new international economic relations (RG6). Moreover, products of certain subsectors, such as barium sulfate and liquid air, are not produced by individual plants; rather, they are byproducts of other production processes in the chemical industry (IE2).

Regarding specific subsectors, polymer production, for example, increased due to the newly opened SOCAR Polymer plant. As a result, specific inputs from the ethylene and polyethylene subsectors increased to maintain production levels. In fact, the productivity of ethylene and polyethylene is regulated according to the demand of SOCAR Polymer (IE2). Therefore, the logistical aspects of the inputs for ethylene and polyethylene were increased to maintain a stable and growing production (MH1). Notably, ethylene and polyethylene production was revived and modernized solely due to the demand of SOCAR Polymer (IE2).

Some experts also believed that relying on Soviet technology to maintain production in the chemical industry was not the right approach for improving and recovering production levels. Thus, private-sector paint production never used inherited Soviet technologies, but rather only new technologies adopted from Turkey (OA9). Paint and lacquer production plants were few in number and in poor condition (OA9). The structure of the market, which was based on many suppliers (competition), also contributed to the country having many plants for the production of paint and lacquer products (OA9).

5.3.3.9. Investments

Industry experts

In Azerbaijan, the main drivers of investment in the chemical industry are short-term rather than long-term profits (OA9). Investments are mainly state and domestic investments (OA9). Some experts expressed the belief that there is no need for foreign participation in the chemical industry as the country is quite capable of making all necessary investments, although problems currently exist with transparency (AB6, EA1). In fact, the government's policy of modernizing the chemical industry has encouraged domestic capital owners to invest and make profits (NN7).

> *Among domestic investors, there are many rich people. They do not want to open a ceremonial hall or a shopping mall; those markets are already taken. An investor may have $5 million and want to do something different, so now he would look for certain cadres and opportunities. (NN7)*

However, some problematic nuances are associated with investment in the chemical industry. In particular, private-sector participation is low and short-term financial benefits cannot be expected (NN7, TG1). There is also no appropriate infrastructure for R&D, no cheap labor, and no MNCs (TG1). This limits the emergence of innovative processes in the industry as well as reduces the potential of skilled labor (NN7). Due to competition problems, an exodus of foreign companies from Azerbaijan’s extraction and chemical industries occurred between 2008 and 2019 (TG1). Therefore, there is no competition and heavy state regulation significantly reduces the attractiveness of the chemical industry (TG1). The state’s investment decisions must be transparent, which is currently not the case:

> *Now, at these crucial moments, the state must monitor the direction of investment appropriately and transparently. Investment decisions must not be tied to a single person. Even if foreign professionals come and share their experience by marketing their ideas, there must be a group whose job it is to oversee those investment decisions. (NN7)*

Overall, the expectations of the industry experts were mainly focused on improving the investment climate and promoting the emergence of the private sector. Only the private sector can ensure competitiveness and thus innovation capacity and long-term prospects (NN7, ISH8, EA1, IE2, TG1). Simultaneously, government investments must be transparent, and additional agencies should monitor the stages after the decision to make these investments (NN7).

Economists

The investment environment in the non-oil sectors, including the chemical sector, is not attractive to foreign investors because the government has failed to implement a stable exchange rate policy and protect investors (IA3, GI1). For example, in 2007 there was a presidential decree to protect FDI and prepare the necessary laws for industrial development; however, it was never implemented (AM2), and the situation remains similar today. In 2017–18, various decisions were made to protect FDI, but instead foreigners can only invest with the approval of the Ministry of Economy or the president himself (AM2).

The involvement of state institutions alone in production will not promote the chemical industry. The private sector, especially foreign investment, must be involved. Investment in high value-added sectors is a high-risk endeavor. It requires a healthy business climate, thorough integration into the global economy, the ability to participate in international value chains, local labor, and innovation potential. It also requires persistent effort and time (EB6).

In the structure of FDI, non-oil sectors have a small share but domestic investment is high (IA3). Until 2007–08, the non-oil sector had a certain share, but between 2008 and 2015 this disappeared, leaving the oil sector to dominate FDI (AM2). FDI could significantly improve non-oil sectors through modernization if suitable investors found their way to Azerbaijan (GI1). Although the Azerbaijani government claims that FDI has been boosted and increased in recent years, this process is not open or transparent (AM2). Therefore, the economy does not promise to motivate investors seeking long-term profits as there are no transparent tenders or tax policies to attract them (IA3).

Current developments in Azerbaijan's chemical industry can hardly be considered to be diversifying economic production due to a lack of confidence in the investment environment as well as a lack of competition among producers (IA3, EB6). Moreover, the number of state-controlled goods is excessive: 39 different categories of goods and services are regulated by the state (GI1). This is particularly inconvenient for investors because once they enter the country, they become consumers of utilities. Water and electricity tariffs can be changed overnight by the Tariff Council—a body defined as a collegial executive authority that enforces government regulation of tariffs. In normal economies where free markets exist, this situation does not exist. Considering all of the aforementioned factors, an opportunity still exists to increase foreign participation in the chemical industry, playing to strengths such as the availability of raw materials and high profits (AM2). However, as SOEs are not efficient, it is unwise to rely only on them in the long run.

5.3.3.10. Production process

Structure of manufacturers – In Azerbaijan, the state is normally the main player in the chemical industry and only one producer exists for a given chemical (MH4). Therefore, several chemicals are produced in the same factory, as indicated by the existing examples of methanol (TG1), ethylene and propylene (MH4, NN7), and a planned sulfuric acid factory (NN7). Opening a second factory to produce the same chemical would not be profitable (AB6) and would require immense investment at the national level (NN7). Thus, the power to influence prices and determine production quantities of a given chemical is in the hands of producers (NN7). Only in the paint and lacquer industry are there multiple players (OA9).

> *Carbamide is nitrogen. Nitrogen is an important chemical. It is used in industry and agriculture. It is widely used in fertilizers for greenhouses and grain fields. Under the right conditions, higher productivity can be achieved. About a year and a half ago, production at the carbamide plant was temporarily halted, which significantly affected prices on the domestic market. (NN7)*

Stability of production – Stability and an upward trend of production in the chemical industry can be ensured by increasing productivity (RG6), securing markets or the demand factor (NN7, EA1), ensuring the availability of raw materials (MH4, MH1, ISH8), having appropriate human resources (ISH8), meeting customer requirements through quality control (OA9, TG1), and organizing health and safety in production facilities (TG1). Technological upgrades are also used to ensure increasing production volumes (RG6). Only one interviewee indicated that safety (risk assessment) is the most pressing aspect of production in the chemical industry (TG1). In other words, risk assessments are not conducted in plants, especially those producing methanol, which hinders employment and undermines the long-term sustainability of production.

Demand factors – Demand factors play a crucial role in determining production dynamics in Azerbaijan's chemical industry (NN7, IE2). Chemical subsectors such as nitrogen and paints develop mainly due to high domestic demand (TG1) and are related to household sectors such as construction. The domestic market is small, while competitive opportunities with neighboring countries such as Russia, Iran, and Turkey are low (OA9). Thus, the domestic production of raw materials in the chemical industry is low (OA9). The polymer industry is changing its production capacity to meet global demand (MH4); however, the production level is still low (TG1). During the oil boom period, imported chemicals were cheaper and domestic production was expensive for a long time, which slowed the industrialization of the chemical sector (NN7).

Know-how and R&D – Producers are discouraged because there are no domestic R&D centers and departments to support the production process (NN7, TG1). Government support and private sector development could help to overcome this problem by providing affordable laboratories and grants (NN7). Currently, there are several laboratories that can provide the necessary services to producers in the chemical industry, but they are very expensive (NNT).

Production costs and productivity – Although a natural upward trend exists in the prices of oil and natural gas (MH1)—the main inputs in the chemical industry—most of the chemical industry, which is state-owned, does not buy inputs from abroad (IE2). The service sector also plays a vital role in production costs, such as through transportation costs (MH1). In addition, production costs must also consider factors such as the impact of certain sectors on the environment (TG1).

5.3.3.11. Problems and challenges

There are no problems – The experts, most of whom worked in state-owned production facilities, did not see any significant problems or challenges with the production of chemicals from a technical perspective (MH4, RG6). However, the economists mentioned numerous problems and challenges (see below) related to the institutional, political, and macroeconomic realities in Azerbaijan.

Diversification and prospects – The state's economic diversification policy is determined by oil prices. Put differently, when oil prices plummet, the state would be more interested in reforming and revitalizing the chemical industry (IE2). When oil prices are high, the state would be more interested in exporting raw materials than processed goods (NN7). However, non-oil sectors are crucial to the development of the economy, with the chemical industry leading the way (IE2). While some industry experts considered the non-oil sectors weak and more domestically oriented than export-oriented (AB6), others believed that the chemical industry promises long-term benefits for industrialization.

The chemical industry in Azerbaijan could offer the highest profitability compared with other sectors due to available raw materials, human resources, and demand (IE2). However, many of the industry experts only saw high potential if the necessary changes, adjustments, and improvements were made to the industry. For instance, if environmentally friendly products, such as ionic solvents and organic salts, can be produced, the expanding world market could enable the export-oriented domestic industrialization of the chemicals (NN7). In fact, the ethylene and propylene plants of Azerikimya PU produce and sell semifinished products, and the industry experts were highly concerned about the insufficient use of available raw materials (ISH8, TG1). If the necessary measures are taken, diversification of Azerbaijan's economy through the chemical industry could be possible; however, at present, this possibility is not perceived by industry experts:

> *One of the problems in the production plant we are involved in is the sale of our products as semifinished products. For example, butylene and butadiene fractions, also known as C4, are sold as semifinished products. However, they can be used for the production of very valuable end products such as rubber. At the same time, it is possible to recover the production of benzol and toluol. However, they are sold as semifinished products. By solving this problem, it would be possible to diversify the production of chemicals. (ISH8)*

Similarly, Azerbaijan sells steam-cracked products such as methanol to Romania, but it imports methyl tetra-butyl ethyl from the same country at twice the price (TG1). Yet, technically speaking, Azerbaijan is capable of producing the same chemical (TG1). This situation is explained by the industry's short-term profit orientation (TG1). Finally, one of the interviewees noted positive changes in the industry because the top management of the plants is selected from graduates of top Western universities, such as Harvard University and Massachusetts Institute of Technology (TG1).

State support – State support is strongest and most planned in the chemical industry (MH4, AB6), albeit in SOEs rather than the private sector (OA9, MH1). Support is provided through various state investment projects (e.g., new non-oil production facilities and recycling facilities; AB6, NN7). The renovation and modernization of methanol and polyethylene plants have been part of this support (ISH8, NN7). In fact, the industry experts strongly believed that without the support of the state, it would be impossible to modernize the old plants and acquire new technologies in the chemical industry (MH1). As a result, the industry now produces urea and polymers to export to foreign markets (TG1). Due to the state's interest over the last 10–15 years, foreigners have shared their knowledge and skills with Azerbaijani producers and boosted the production of polymers and urea (TG1).

Since Azerbaijan's independence from the Soviet Union, former President Heydar Aliyev has visited oil refineries and similar chemical plants 20 times, whereas he visited the other non-oil production facilities only once (RG6). In addition, the state has begun to support the export of chemicals through certain policy instruments, such as export subsidies (OA9). However, the private sector would be extremely grateful if government support would promote the production process rather than exports:

Again, commodity prices are going up. I think if the government provides some support, the economy will flourish. Our tax rates are high. That is why we are having some difficulties. (OA9)

State support is also evident in the institutional support for non-oil producers, of which the chemical industry is a crucial part. For example, presidential decrees restricting government audits have been expanded, while the judicial system has been strengthened to more effectively handle producer complaints (OA9). However, other participants believed that much still needs to be done to achieve improved results in terms of government support for the chemical industry. For instance, government protection of customers and producers should be more enforced (IE2). Although government support has increased over the last seven years—largely due to SOCAR's investments and actions—there was virtually no government support in a more specific and specialized form between 2005 and 2014 (EA1). This attitude of the state has led to uncertainties in the chemical industry in the long term (EA2).

Furthermore, economists believed that state institutions have made progress since 2012; however, there is still a lack of antitrust authorities and well-designed export promotion institutions (ES4).

Private sector – The small share of the private sector is the largest problem facing Azerbaijan's chemical industry. The experts compared Azerbaijan with countries such as Turkey and Iran, concluding that the multiproducer structure and high share of the private sector have helped these countries to develop their chemical industries (NN7).

5.3.3.12. Political and institutional environment

Although SOCAR has significantly increased its efforts to revitalize the chemical industry, the political and institutional environment has lagged behind in supporting the industrialization of chemicals in Azerbaijan (GI1, IA3). The government implements reforms only during periods of low oil prices, but these are ad hoc and declarative (IA3, AM2). In other words, since the low oil prices of 2016, only the government's agility in implementing the diversification plan has changed, but property rights, tax policies, and other institutional mechanisms have remained problematic (IA3). The restrictive environment persists, largely based on the existence of monopolies, unofficial barriers, low independence of courts, rampant corruption, and weak protection of entrepreneurs' rights (IA3, GI1). However, the necessary policy and institutional frameworks are required to spur investment (SB5). Even if reforms continue and institutional innovations support the industrialization of non-oil sectors, the strengthened position of large, already active companies would hinder the entry of new players into international markets (GI1).

> *But, as we can see, the government was not willing to go down this road to achieve these goals. From that point of view, these are belated measures. All of the markets had been divided up. Many monopolies had formed. The measures that followed were ineffective because there was no free economy and no entrepreneurship, and this problematic situation was not fundamentally addressed. I must say that once the markets were divided, the government was unable to liberalize them through legal regulations, institutions, and decisions. (GI1)*

Although the interviewees were mostly pessimistic about the institutional environment, they all agreed that many decisions and reforms were implemented in 2016–17 to strengthen the role of non-oil manufacturing in the economy (SB5, GI1). These included improved licensing mechanisms, increased investment and export promotion, and the establishment of industrial parks and districts. All of these reforms have played a positive role in increasing production in the non-oil sectors (SB5).

In addition, the cultural environment does not support the current industrialization of non-oil sectors (AM2). In other words, industrialization based only on the adoption of technologies in the chemical sector as well as in the non-oil sectors cannot be successful in the long run (AM2). The current trends in industrialization are based on entirely different things, such as big data and the Internet of Things, rather than on physical commodities such as oil and natural gas (EB6). Therefore, an innovative ecosystem should be designed and improved; otherwise, the necessary environment will not be able to support the long-term development of specific sectors and subsectors (EB6). The business environment has also never fully supported industrialization, which led to a de-industrialization process after 2005–06 (EB6).

5.3.3.13. Re-industrialization of the chemical sector

The nature of the ongoing industrialization and its expected outcomes could provide useful insights into the already completed de-industrialization of Azerbaijan’s economy. Some economists consider the recent chemical-based industrialization to have been successful, as the share of non-oil-based manufacturing in total output and exports is growing (IA3). This creates discernible backward and forward linkages between economic sectors (ES4) and the new phase of industrialization of the chemical industry, which positively affects the balance of payments (SB5). Therefore, the development of the chemical industry by the state is critical because it significantly contributes to non-oil exports (EB6). Indeed, numerous opportunities exist to profit from natural resources such as oil and natural gas, including the following: Soviet heritage and traditions in the chemical industry (IA3, EB6); available oil and natural gas resources (SB5, EB6); rising prices for non-oil goods in international markets (GI1); SOCAR investments (GI1); rising oil prices as a source of financing for the chemical industry (GI1); the possibility of establishing small non-oil production zones with private sector participation (AM2); other available resources (AM2); an upward trend in organic agriculture (AM2); and the possibility of expanding domestic markets and improved access to international markets (AM2, EB6). Despite these positive perceptions, a general criticism of ongoing industrialization initiatives in the chemical industry seemed to prevail.

According to the economists interviewed, the current industrialization of chemicals is not free of risks and failures in the medium and long term. For example, the beginnings include illegal entrepreneurship by state officials, barriers to entry into specific sectors by individual companies and holdings, a lack of freedom in the economy, as well as the failure of the country's monetary and exchange rate policies (GI1, SB5). The cadre potential in the chemical industry is low, while the government's program for 2007–2015 was not efficiently managed and did not provide the necessary skilled workers for the industry (GI1). Indeed, to fully support technological adoption, specialists trained in the West are required to solve the challenges that the domestic education system has been unable to address. In addition, a downward trend has occurred in foreign and domestic investment in the chemical industry (GI1).

5.3.4 Summary of the section

In this study, both quantitative and qualitative methods were used to analyze the phenomenon of oil-induced de-industrialization using the Azerbaijani economy as an example. Regression estimates (stepwise + OLS, FMOLS, and CCR) revealed that subsectors such as chlorine and liquid soda were significantly negatively affected by the oil boom in the short run. However, the impact of the oil boom on chlorine and hydrochloric acid production was significantly positive in these subsectors.

Moreover, oil prices were the main explanatory channel for the specific subsectors of the chemical industry. For example, they had a significant long- and short-term impact on chlorine production. There was also a weak statistical significance of the positive effect of oil prices on isopropyl alcohol; however, this relationship was negative in the long run. Furthermore, oil prices exhibited a high tendency to explain the production of liquid soda and sulfuric acid. While they had a positive effect on the production of liquid soda and sulfuric acid without a lag, the opposite was true in the short run when oil prices were lagged by one year.

The REER, the next most important variable in DD studies, had a negative impact on the production of chlorine and liquid soda, both in the short and long run. However, for hydrochloric acid, a significantly negative impact was found only in the long term. In both the short and long run, the regression equation for caustic soda and liquid soda production revealed a significantly negative effect only for the one-year lag of oil prices.

Quantitative methods also pointed to the importance of service sector employment, an indication of indirect de-industrialization when it occurs together with REER appreciation. Specifically, employment in the service sector had a negative and statistically significant long-term impact on the production of chlorine, sulfuric acid, and hydrochloric acid. At the same time, only chlorine production showed a statistically significant and positive relationship with service sector employment. Moreover, employment in the service sector has a negative impact on the production of liquid soda with a one-year lag. In other words: When service sector employment increases, chemical industry production decreases in parallel with the increase in REER. This leads to the indirect de-industrialization claimed by Cordern (1984), the first proponent of the DD hypothesis.

Interviews with industry experts and professional economists revealed that the specific subsectors of the chemical industry have experienced de-industrialization for several reasons. For example: (i) outdated Soviet technology that no longer met economic and environmental requirements; (ii) decreased domestic demand; (iii) inability to compete with imported chemicals; (iv) termination of government support; and (v) increased production costs. Government support to non-oil manufacturing industries, including the chemical industry, was discontinued during the period of high oil prices. This point can be considered as one of the main factors for the decline of the de-industrialized chemical subsectors. Nevertheless, subsectors such as ethylene, polyethylene, and methanol have grown since 2014 and 2015, as SOCAR Polymer and

Azerikimya PU have opened new production facilities for polymers and related products.

The quantitative and qualitative results overlap in the following way: (i) between 1995 and 2020, there was both a negative and a positive correlation between oil prices and the production of chemical subsectors; (ii) after 2005 and 2006, Azerbaijan experienced a dramatic structural change in industrial production - the rise of the oil industry. This led to an increase in the REER and the high cost of domestic production. Then, rent-seeking behavior of state agencies with respect to oil revenues led to the collapse of certain non-oil manufacturing subsectors, including the chemical industry; (iii) both quantitative and qualitative analyzes did not identify productivity-related reasons for de-industrialization, which is a common cause of de-industrialization in advanced economies. Both methods pointed to the adverse indirect effects of the rise of the oil industry in Azerbaijan. This supports the hypothesis of DD -led de-industrialization due to oil-dominated industrial production; (iv) Since the state is the main producer of oil, chemicals, and petrochemicals, short-term profitability signals play an important role in the production of chemicals. When crude oil is more profitable, the government increases oil exports, which has a negative impact on the chemical industry. However, when oil prices fall dramatically, the government diverts oil revenues into investments to renovate some old production facilities or to adopt technologies from abroad to process crude oil. The latter leads to high volatility of production in the chemical industry.

Overall, it appears that the current industrialization of the chemical industry is mainly controlled by the state and there is usually only one producer of a given chemical, with the exception of the paint and lacquer industry. Production costs are not known to the public, and FDI is non-existent. Even though recent changes in the institutional environment have helped boost domestic production and exports, there is simply no way for entrepreneurs to participate in this industrialization process. In other words, judicial independence, corruption, and the rule of law severely limit the ability to protect investors and other interested parties. In fact, the extensive presence of the state and the development of a large-scale chemical industry has made the Azerbaijani economy dependent on oil again, as the chemical industry mainly consumes raw materials from the extractive industry. Some experts believe that this will make it more difficult for Azerbaijan to develop non-oil production sectors in a sustainable and long-term manner. In order to overcome the above challenges in the chemical industry, certain policies and reforms need to be considered. Therefore, the following chapter concludes this dissertation with policy proposals based on the literature review and the experiences of other countries.

CHAPTER 6

CONCLUSIONS AND POLICY IMPLICATIONS

Now that the NRC, DD, and de-industrialization in Azerbaijan's economy have been investigated, this chapter provides a summary of the dissertation's findings, policy implications, limitations, and recommendations for future research. The main objective of this dissertation was to analyze the de-industrialization of non-oil manufacturing, particularly the chemical industry. In addition, this chapter formulates relevant policy suggestions based on the results of the research as well as the literature review on industrial policy and its various types. Section 6.1 provides a summary of the findings based on the research questions and hypotheses; Section 6.2 discusses industrial policy and its essential components for Azerbaijan's economy to counteract oil-related de-industrialization; and lastly, Section 6.3 identifies the limitations of the studies in this dissertation and suggests directions for further research.

6.1. Summary of the findings

As a small, oil-rich post-Soviet country, Azerbaijan pursued a resource-based industrialization strategy to develop its economy after the collapse of the USSR. Perhaps this was the best decision for a country that survived a painful transition process from a command economy to a market economy, not to mention a war with Armenia. However, Azerbaijan has the most oil-dependent economy of the FSU countries, especially since the large oil and gas projects came on stream. The main source of domestic production is oil and gas products, with more than 90% of exports consisting of crude oil and gas. The government heavily relies on transfers from the sovereign wealth fund (SWF, SOFAZ) to finance its spending policies. Under these conditions, booming sectors can negatively affect non-booming sectors, creating lagging sectors.

The study presented in Chapter 5 tested the following hypothesis about NRC: "*Oil-related variables have a negative influence on political and institutional quality"* **(H_a1)**. First, figure analysis was conducted to identify initial signs of a slowdown or negative developments in the country's institutions during the oil boom period. Then, by using PCA it was possible to reduce the data set, focusing on the most relevant variables to capture the supposed negative relationship between the oil sector and institutional quality. In fact, the PCA yielded two distinct groups of variables, namely the oil factor and the institutional factor, which were analyzed using DOLS. The estimated models demonstrated the presence of a negative relationship between the oil sector and institutional quality in Azerbaijan between 1995 and 2019. The DOLS model was significant with a lag of one year and a lead. Thus, it takes time for inefficiencies in the management of the oil industry to affect institutional quality. Therefore, **H_a1** was accepted.

In addition, the alternative was adopted for the following hypothesis, which was tested using linear multivariate OLS regression: "*Oil-related variables (e.g., oil rents, oil dependency, and oil abundance) have a negative relationship with human capital indicators, such as education and health care"* **(H_a2)**. In other words, the rise of the oil industry in Azerbaijan was associated with lower spending on education, higher out-of-pocket spending on health care by citizens, and poor protection of human rights. Thus, **H_a2** was accepted.

DD in Azerbaijan's economy were tested via four main hypotheses: *"Oil prices appreciate the Azerbaijan's REER"* **(H_a3)**; *"The nominal or real effective exchange rate and oil-related variables have a negative relationship with non-oil manufacturing"* **(H_a4)**; *"Higher oil prices and the appreciation of the REER had either a direct or indirect impact on sectoral output and employment in the non-oil manufacturing sector in Azerbaijan"* **(H_a5)**, and *"Oil revenue creates inflationary effects through government revenue or spending and population income"* **(H_a6)**.

H_a5 was tested using linear multivariate OLS and an unrestricted standard VAR model. However, before focusing on the three-sector DD model of Azerbaijan's economy and its main effects, namely resource movement and spending effects, the role of oil prices in the appreciation of the REER was examined. The VAR model captured the Azerbaijani REER's notable positive responses to rising oil prices. This result was robust as it survived additional testing through a VAR Granger causality test, FMOLS, and CCR.

Using three-sector aggregate DD models, the EDI—which measures dependence on the oil sector—was found to have a negative impact on the output, value-added, employment, and exports of non-oil tradeable sectors, such as manufacturing and agriculture. As expected, the EDI had a positive impact on the output of booming sectors, such as oil and gas. The most critical variable in DD studies, namely the REER, was also tested in its two forms—nominal and real. Similar to the EDI, the REER had a negative impact on the value-added, employment, and exports of non-oil sectors. These results prompted the author to test the specific effects of the theory developed by Corden and Neary (1982) and Corden (1984). For this purpose, multivariate linear OLS and unrestricted standard VAR models were used between 2000 and 2019 for OLS and between 2001Q1 and 2020Q4 for VAR. Hence, **H_a3** and **H_a4** were accepted.

Since the OLS and unrestricted standard VAR models provided statistical evidence of resource movement and spending effects, the fifth and sixth alternative hypotheses **(H_a5** and **H_a6)** were accepted. More specifically, although employment and output growth rates did not cause significant declines in lagging and non-tradeable sectors, the growth rates of non-tradeable sectors negatively affected the employment and output of lagging sectors. To extend the analysis, unrestricted standard VAR models were applied to analyze the impact of the REER, oil prices, and service sector employment on manufacturing employment. The obtained estimates indicated that these three variables negatively impacted manufacturing employment. Moreover, OLS and BVAR models were used to examine whether government spending was responsible for rising domestic inflation. Both CPI and inflation increased during the year, which was related to the government's high propensity to spend oil money in a very short period. These results are consistent with those of recent studies by Alssadek and Benhin (2021), Abdlaziz et al. (2021), and Majidli (2022).

Chapter 5 also analyzed the chemical industry in the context of a DD-related de-industrialization framework. This represented the non-oil manufacturing sector, which experienced a production slump at the beginning of the oil boom in 2005. The chapter tested the following hypothesis: *"DD in Azerbaijan has led to the de-industrialization of non-oil tradeable industrial sectors since 1995, especially in the chemical industry"* **(H_a7)**. Stepwise, OLS, FMOLS, CCR, and RLS were used to analyze the collected chemical industry production data. The regression methods provided robust and reliable results. According to the quantitative analysis, which included both short- and long-term modeling of subsectors such as chlorine, hydrochloric acid, and sulfuric acid, the REER, service sector employment had a negative impact. This highlighted the relevance of indirect de-industrialization in DD theory. Depending on whether the models were short- or long-run, the oil boom and oil prices both had positive and negative effects on the subsectors. Moreover, in no case was real labor productivity selected by the stepwise algorithm, underscoring the role of oil- or DD-related variables (this was also supported by the qualitative results). Thus, **H_a7** was accepted. This demonstrates how DD has affected different parts of Azerbaijan's economy.

A qualitative method, namely expert interviews, was also used to collect data and analyze opinions. Thus, it was possible to clarify that, as in the case of DD, production costs and domestic inflationary pressures increased, imported goods displaced domestic products, and reduced government support led to a drop in production in certain subsectors of the chemical industry. In addition, both quantitative and qualitative methods supported the view that oil prices can have either positive or negative effects depending on the objectives of the government, which is the main player in the oil, natural gas, chemical, and petrochemical industries. Years such as 2005 and 2006 were turning points for the non-oil industry, including chemicals in Azerbaijan, as structural changes, rent-seeking behavior, and monetary pressures significantly affected the chemical industry's production and exports.

The results of this study improve our understanding of the interaction between non-economic and economic explanations of the NRC phenomenon thanks to a stepwise, in-depth research design that tracks the impact of the rise of the oil industry on non-oil manufacturing sectors. In other words, the Azerbaijani example shows how de-industrialization due to resource booms—triggered by oil prices—can lead to harmful macroeconomic effects that downgrade the status of non-oil tradeable sectors as profitable sectors. Moreover, not only conventional macroeconomic indicators but also country-specific estimates allowed for a more accurate capture of NRC and DD impacts. EDI, MPC, and the oil boom (the dummy variable accounting for the production and revenue peaks of the Azerbaijani economy between 2005 and 2014) contributed significantly to the theoretical clarification of DD-led de-industrialization of the Azerbaijani economy. At the same time, it should be mentioned that the incorporation of the original DD theory of Corden and Neary (1982) and Corden (1984) with the advanced econometric and qualitative approaches allowed for more conclusiveness in terms of the theoretical aspects of the models. The theoretical aspects of NRC and DD vary in resource-rich countries due to the heterogeneous nature of political and government institutions in these countries. This presents a challenge to applying the original thoughts of NRC and DD theories in their raw form, but the case of Azerbaijan proved fruitful and productive due to the exclusive and individualistic approach of the research design. Nevertheless, de-industrialization in oil-rich countries is not well explored in the literature and has not been considered in the case of small and open systems. Hopefully, future research will focus sufficiently on resource-rich countries that have experienced the phenomenon of de-industrialization in the context of DD.

6.2. Policy recommendations

Industrial policies typically aim to increase production efficiency, product differentiation, and the ability to generate temporary innovation rents (Peneder–Streicher 2018). In a resource-rich country like Azerbaijan, a whole range of industrial policies and other measures, such as exchange rate policies and institutional policies, must be carefully designed to prevent DD effects and the NRC. Otherwise, challenging the dominance of the oil industry in the economy in the medium and long term may become even more difficult. In the following two subsections, the abovementioned aspects of Azerbaijan's economy are explained from a policy point of view and recommendations are provided. These suggestions and recommendations also take into account the results of the studies in this dissertation.

6.2.1. Policy implications: Exchange rate and institutions

Oil-rich countries or countries that specialize in exporting commodities are vulnerable to volatility in their REERs. This is because their economic growth is closely linked to commodity prices. Exchange rate and oil price fluctuations pose a significant threat to the macroeconomic stability of oil-rich countries (Rickne 2009), including Azerbaijan (Majidli 2020). Rey (2006) asserted that exchange rate policy could be used as a policy tool to stabilize the monetary challenges posed by commodity prices, including REER appreciation. For instance, a stabilization fund (i.e., SWF) has been a common institutional measure for supporting monetary and fiscal policy in oil-rich countries since the 1960s (Carnerio 2007). It helps to sterilize excess foreign exchange by saving it abroad as well as reduces domestic inflationary pressures. Furthermore, SWFs must develop a culture of saving windfall revenues for future generations and focus on long-term economic goals. However, SWFs are not a solution to the risks posed by institutional problems and government failures.

Azerbaijan has an SWF—namely SOFAZ. Even if a resource-rich country has a stabilization fund, it will not be successful if the fiscal authority finances its expenditures by frivolously spending windfall revenues and borrowing abroad during commodity supercycles (Carnerio 2007). In other words, if an SWF is poorly integrated into the government budget and its management is not coordinated, then SWF revenues may be an even less transparent way to manage oil revenues (Davis et al. 2003).

The empirical results of this dissertation confirmed that Azerbaijan exhibits clear signs of the effects of DD and the NRC. This indicates the insufficient saving of foreign exchange abroad, which could mitigate inflation effects and regulate domestic consumption. Moreover, according to the fund's annual reports, the share of SOFAZ in the state budget has always been between 45% and 65%. The cost of simply drawing money from SOFAZ to finance state budget expenditures has been low due to the short-term orientation and rent-seeking behavior of state institutions. This demonstrates that even if a stabilization fund existed, it would only serve to isolate the surplus foreign exchange from the economy to improve the government's net asset position and protect against the turbulence of oil prices.

Following sharp declines in commodity prices in 2014 and 2015, the government adopted a fiscal rule known as the "Golden Rule" for the transfer of oil revenues to the state budget in 2018 (EEI 2019a). To determine the amount of oil revenues that can be spent, it is first necessary to determine the difference between oil revenues and the 30% of net financial assets[111] at the beginning of the projected fiscal year. Then, 20% of this difference must be calculated and added to the smallest of the obtained indicators. However, the Golden Rule was applied only in 2019 and, due to the COVID-19 pandemic, its application was postponed until 2022 (Aghayev 2021). Thus, 13 years after the beginning of the oil boom, a fiscal rule was elaborated in 2018 but only applied for one year. Under these circumstances, the following question arises: How can the spending effect of DD be mitigated?

Referring to the unrestricted standard VAR model of this study, one observes that Azerbaijan's REER skyrocketed during the oil boom thanks to the commodity price supercycle and wild government spending. This led to calls for fiscal and monetary policy measures to contain inflationary pressures created by the imprudent use of oil revenues in a short period. Furthermore, sharp devaluations of the AZN in just one year (2015), a dramatic increase in the REER, and the high cost of domestic production call for more stringent and robust policy measures to be implemented by the government.

[111] To determine the net financial assets, SOFAZ's assets, the single treasury account, and the foreign debts of the foreign countries to Azerbaijan will be summed up, and domestic and foreign public debt will be deducted from the result (EEI 2019b).

They would at least curb the effects of DD, especially the spending effect, when the commodity supercycle begins.

Moreover, tax revenues outside the oil sector were of little interest to the authorities for filling the state budget. Oil-rich countries employ such behavior to reduce democratic accountability and popular representation in political decisions, so that the political government can remain in power (Auty 2003). This is a common reality in oil-rich countries, where the political state rapidly expands its power during commodity price booms and has it dramatically weakened when prices fall (Auty 2003). Since fiscal and monetary policies are closely linked, the Azerbaijani government should seriously devote its resources to improving the effectiveness of monetary and fiscal policies. Responsible fiscal spending is one of the fundamental conditions for overcoming the de-industrialization problem in an oil-rich country (Rickne 2009).

Next, institutional policies pose a significant threat to reducing the negative impact of DD and NRC effects on non-resource sectors. The economies of resource-rich countries have similar features that impede long-term sustainable economic growth and development. For example, high government consumption and poor institutional quality in turn lead to low total factor productivity (Espinoza et al. 2018). In particular, poor institutional quality reduces sectoral productivity, cancels the positive effects of domestic and foreign investment, and halts government support for non-booming sectors (Alssadek–Benhin 2021). This occurs because institutions cannot transform available economic resources into productive forces. Noteworthily, Alssadek and Benhin (2021) found that domestic and foreign direct investment have significantly negative impacts on sectoral productivity in oil-rich countries.

Moreover, Gunesch (2018) argued that the role of institutions in resource-rich countries should be strengthened to reduce rent-seeking behavior. Human capital should also be developed to diversify the economy in a manner compatible with East and South Asian countries.[112] This is supported by recent studies, such as that of Perez and Claveria (2020), who argued that it is critical to work toward improving the quality of educational institutions. Developing institutional control mechanisms that promote compliance with laws and provide investor protection will also increase transparency and reduce the overall economic uncertainty. Resource-rich countries can benefit from commodity booms by expanding their manufacturing sector, developing their

[112] Here, the author gives the example of East Asian countries as a benchmark because they are latecomers to the industrialized world.

economies, as well as minimizing the negative impacts of the NRC by improving their institutions (Amiri et al. 2019). However, such countries are typically unprepared for the reforms and policies that they require to benefit from windfall revenues.

Democratic constraints, or checks and balances, are also a crucial part of the institutional measures for managing resource wealth transparently and efficiently (Gunesch 2018). Some believe they can be successful at the political and economic levels because they place limits on the abuse of political power. Examples of democratic controls include the rule of law, separation of powers, freedom of speech, a free press, and an independent court (Gunesch 2018). Indeed, political governments in resource-poor countries are aligned with the interests of the majority of the population, whereas in resource-rich countries this is either not the case or progress is slow (Olson 2000). In Azerbaijan, however, the willingness of the majority to participate in politics and take political action was lower during the oil boom than in the pre- and post-boom periods. The decreased quality of institutions and the population’s reluctance to engage clearly highlight the need for appropriate policies to reform and change this situation.

This study found negative associations between institutional, human capital, and oil-related variables in Azerbaijan’s economy; however, it should be mentioned that for a long time the country was subject to central planning and had a highly distorted economy, which created difficult initial conditions for reform. This difficulty was exacerbated by the onset of the commodity supercycle, which provided high oil rents, as the government’s main focus was on maintaining these revenues. The situation is no different in 2022 at the time of writing this dissertation, which led the author to consider a gradual or dual track reform agenda rather than a strategy of rapid reform (Auty 2003). In other words, the Azerbaijani government could implement the aforementioned policy directions through gradual reforms to reduce the social costs and political resistance to the reforms and the new policy agenda. The role of the state in the economy is still high and a sudden withdrawal might not be a wise decision. However, observations and literature reviews have suggested that the necessary institutional reforms are declarative, temporary, and speculative (Bayramov 2016; Ibadoghlu 2020; Guliyev 2020). This not only hinders the transparent and efficient allocation of oil revenues to productive economic forces in the non-oil sector but also delays the long-awaited diversification process.

In general, in countries where DD and the NRC are widespread, the manufacturing and private sectors are in decline while the public sector is growing

(Farzanegan 2014). In resource-rich countries, the greater the dependence on oil, the poorer the quality of the business environment, which can be addressed through sound policy making (Farzanegan 2014). If human rights are not protected, education is neglected, and the health care system fails during the oil boom, then the effectiveness of the government at minimizing the “curse” of oil abundance is questionable. The main policy guidelines for institutions must be as follows: promote human capital accumulation, enforce the rule of law, strengthen investor protection, ensure court independence, and reduce favoritism (i.e., rent-seeking and crony capitalism). If properly implemented, these guidelines would guarantee an adequate enabling environment for private enterprises as well as promote entrepreneurship. In this case, the demand for human capital and social pressure on the government would increase, sending a signal to be more careful and responsible with institutions and human capital in oil-rich Azerbaijan.

As Carnerio (2007) argued, the government should effectively resolve the political problems associated with competing interests in natural resource rents and make the trade-offs necessary for ensuring successful economic policy. Early competitive industrialization rapidly builds human, institutional, and social capital in resource-poor countries (Auty 2003). After eliminating the negative effects of the oil boom on the institutional, human, and non-oil sectors, a development-oriented political state should improve the entrepreneurial environment, thus helping the economy create more labor-intensive manufacturing jobs.

Based on the proposals of Mehrara (2009), Beverelli et al. (2011), Benkhodja (2014), Chang (2015), Bunte (2016), Popov (2019), Majumder et al. (2020), Alssadek and Benhin (2021), and Raifu (2021) for oil-rich countries, this study recommends the following measures to the Azerbaijani government to reduce the impacts of the NRC and DD: 1) Focus on improving technology, infrastructure, and human capital to lower the cost of doing business in non-oil manufacturing and agriculture; 2) implement appropriate exchange rate policies, tax cuts, more transparency, and greater efficiency in subsidy mechanisms; 3) attract more new players to domestic markets, especially in non-oil manufacturing, which would mean less state-led re-industrialization (although the example of the chemical industry in Azerbaijan indicates the opposite); 4) have the central bank introduce inflation targeting and flexible exchange rate policies to address the effects of DD during an oil boom[113]; 5) modernize the chemical and petrochemical industries, which consume much oil and natural gas, to make their production more efficient[114]; 6) prioritize the development of international trade policies that promote trade openness (e.g., free trade agreements and tariff reductions)—joining the WTO could help to reduce the oil curse; 7) increase investment in education and health sectors to maximize gains from oil revenues; 8) accelerate ICT and maintain e-government improvements to reduce interactions between citizens and corrupt public officials and employees; however, it should be noted that Azerbaijan ranks 56th in e-government development as measured by the E-Government Development Index (EGDI); nevertheless, the necessary drivers for eradicating corruption to improve institutional quality remain a challenge and invite a focus on inefficiencies in e-government development; 9) limit wage increases and employ egalitarian wage policies to regulate the labor market, mitigating the resource movement effect of DD and thus preventing direct or indirect de-industrialization; 10) increase the efficiency of SOFAZ, which could be achieved by developing deeper capital markets (which, according to Conrad [2012] seem weak and problematic in Azerbaijan); the government and stakeholders should save when oil prices are high and spend when they are low, thereby reducing vulnerability to oil price shocks; 11) undervalue the exchange rate, which may be a necessary policy decision for supporting current industrialization efforts and overcoming the effects of DD; and 12) implement policies aimed at improving the quality of decision making and institutions. This is because, regardless of industrial or other economic policies, the government is likely to fail if its capacity is constrained by an incompetent bureaucracy; selective industrial policies are implemented under high uncertainty and with limited information.

6.2.2. Industrial policies

Acocella (2005: 186) defined the concept of industrial policy as follows: “policies aimed at modifying the productive structure and, therefore, increasing allocative and dynamic efficiency” as part of public intervention to correct market failures. Market

---

[113] However, if a country already suffers from NRC or DD, then a free-floating exchange rate may jeopardize the economy’s future growth. This was found by Zhan et al. (2021). The authors found a persistent and statistically negative relationship between natural resource rents and the flexibility of exchange rates.

[114] Beverelli et al. (2011) argue that countries which intensively export oil are more prone to DD effects compared to countries that domestically consume oil. Therefore, by encouraging domestic industries to utilize rich natural resources, one can increase manufacturing output and boost economic growth. This is known as the Rybczynski theorem.

failure occurs when price-market institutions are unable to support “desirable” activities (Bator 1958). Similarly, Noman and Stiglitz (2015: 9) defined an industrial policy as “any action that aims to alter the allocation of resources (or the choice of technology) from what the market, left to itself, would bring about.” Industrial policy is desirable because it can solve coordination problems, promote positive externalities, create knowledge spillovers, and compensate for knowledge and risk deficits (Noman–Stiglitz 2015).

Through industrial policies, states may seek to change the sectoral composition of production, technology, or linkages (i.e., restructuring; Acocella 2005). The belief that market mechanisms do not function optimally has produced two sides in development economics, namely the interventionists and the proponents of free markets (Datta-Chaudhuri 1990). The interventionists tend to use various policy instruments and tools to correct market failures. Free market advocates, on the other hand, cite a long list of ill-conceived and unproductive policy initiatives taken by the governments of many countries at certain stages of development, which have led to the wasteful use of resources in their economies (Datta-Chaudhuri 1990). Although the literature is rich with works in favor of a free market economy, Tufiş (2010) cautioned researchers not to be one-sided and drew their attention to the inevitability of government intervention in certain situations.[115]

Acocella (2005) based his notions of industrial policy on the concepts of allocative and dynamic efficiency. Allocative efficiency refers to managing available resources without waste, whereas dynamic efficiency is the ability to respond to or cope with changes introduced by others. According to Abel et al. (1989), the analysis of economic growth, impact of fiscal measures, and valuation of capital investment must all consider the problem of dynamic efficiency. Otherwise, high levels of profitability and faster growth rates cannot be sustained (Acocella 2005). In other words, a dynamically efficient economy is one in which returns to capital consistently exceed

[115] Concerns that manufacturing de-industrialization created for sustainable economic growth and development across the globe have been translated into new and more significant policy decisions to minimize it. For instance, industrial policy, long ignored, has reemerged in academic and policy debates, fostering optimism for an industrial rebirth (Peneder–Streicher 2018). On both sides of the Atlantic, policy focused on re-industrialization, resulting in the European Commission's (2012) goal of 20% manufacturing in GDP by 2020, as Peneder and Streicher (2018) mentioned. However, can de-industrialization in general, and in specific subsectors of the manufacturing sector among the resource-rich countries, be reversed?

investment. However, according to Geerolf (2013), if investment always grows faster than returns on investment, the economy is dynamically inefficient.

In Azerbaijan, the slowdown and collapse of specific subsectors of the chemical industry and the fluctuating performance of the so-called developed subsectors clearly demonstrate a lack of allocative and dynamic efficiency. Moreover, that the production level of subsectors such as chlorine, hydrochloric acid, and sulfuric acid could not be maintained also indicates a lack of static or allocative efficiency. On the other hand, the fact that the state always invests more than it takes in profits in the current re-industrialization of subsectors, such as polymers and urea, could indicate a lack of dynamic efficiency.

According to Peneder and Streicher (2018), the assumption that industrial policy can reverse the trend from de-industrialization to re-industrialization is based on the premise that the loss of comparative advantage in manufacturing drives de-industrialization. In other words, the authors believed that de-industrialization can be reversed if the problem is only due to comparative advantage. For this reason, it is necessary to separate the effects of comparative advantage from other causes of structural change.

In the context of this dissertation, the following question arises here: Did the collapsed or slowed subsectors of Azerbaijan's chemical industry have a comparative advantage? Unfortunately, the answer is ambiguous: On the one hand, the main industrialization phase of the chemical and other non-oil sectors occurred during the Soviet Union period, where the industrialization process was based on the decisions of central planning units and union-wide demands. Because it did not operate within the command system, international economic exchange did not help to promote the openness of FSU countries or their ability to compete for the benefits associated with participation in the global division of labor (Misala 1992). Moreover, the production of chemicals, such as chlorine, soda, and sulfuric acid, was possible with lower opportunity costs. When the USSR collapsed, FSU countries found almost immediately that their production was not competitive in international markets for the following reasons: innovation was low, the service sector was underdeveloped, the agricultural sector was neglected, and the cost of domestic production was high (Misala 1992; Krajnyák–Zettelmeyer 1998).

Azerbaijan has a difficult time competing with Iran, Russia, and Turkey in the production and export of its chemical products. Azerbaijan had considerable potential in the chemical and some other non-oil manufacturing sectors; however, the loss of comparative advantage due to the negative impact of the oil boom diminished its role in the economy. Thus, export promotion and government support for the manufacturing of chemicals and other non-oil products should be improved and made more systematic and comprehensive. They should not be vague and invented on the spot.

It seems that the main industrial policy tool of the Azerbaijani government is the creation of SOEs to increase both oil and non-oil production and exports through the same actor—SOCAR. This worries SOCAR's independent evaluators and observers, as the company increasingly shuts itself off from the public. News about the company and information about sales are increasingly sparse, although financial and operational reporting is highly active (EEI 2018). In addition, information about SOCAR's subsidiaries and joint ventures is not available, while medium- and long-term strategy documents do not exist (EEI 2018). In addition, SOCAR is the largest supplier of foreign exchange to Azerbaijan's economy, but precise norms for financially regulating its financial flows appear to be lacking (EEI 2018). All of these problems underscore the problematic nature of Azerbaijan's current industrialization phase, as the responsible actor, SOCAR, holds a monopoly position and can determine the production and exports of both the oil and non-oil sectors. The lack of institutional mechanisms to control SOCAR and its dominant position in the national economy put the entire national economy at risk (EEI 2018). This is the most critical problem to be solved in terms of policy implications for the development of non-oil production by SOEs.

A local think tank strongly recommend that SOCAR "adapt best international practices in the light of international initiatives and local transparency initiatives that refer to international practices. These practices should be based on transparency and accountability, good governance, and openness to the public" (EEI 2018: 32). Otherwise, the typical inefficiencies of SOEs in post-Soviet countries will jeopardize the current wave of re-industrialization in the chemical and petrochemical sectors; potentially, this could lead to the collapse of other non-oil manufacturing sectors (including agriculture) if SOCAR fails to financially support them in times of low oil prices.

As the qualitative analysis in Chapter 5 demonstrated, the supply of human capital to the chemical industry is problematic. This usually fuels the ongoing de-industrialization process seen in many developing countries (Kopsidis-Ivanov 2017). In addition to the monetary challenges that oil revenues pose to Azerbaijan, the ability of firms to engage in creative destruction and creative accumulation has been hampered by the lack of effective linkages between universities and R&D laboratories. Thus, their ability to compete with new product development in more developed countries has been limited. Similar to the Malaysian case, it is critical to link meso-organizations with businesses, especially local ones, and then establish performance criteria with appropriate accounting tools (Rasiah 2011). It is also necessary to establish a framework that guides universities, intermediary organizations, businesses, and other economic entities in the commercialization of R&D (Rasiah 2011).

Rasiah (2011) discussed the case of Malaysian de-industrialization, including the need to establish independent and accountable organizations to monitor ex post technology transfer agreements with foreign technology suppliers. A similar need exists in Azerbaijan’s manufacturing sector, particularly in the chemical industry. The state simply imports foreign technology and opens factories and enterprises in said industry, hoping to gain competitive advantages due to the availability of low-cost input resources such as oil and gas. An industrial policy to re-industrialize Azerbaijan’s non-oil manufacturing sector should promote entrepreneurial experience, skills, and expertise by encouraging private sector participation, in line with expectations of transition countries (varc-Dabi 2019).

Upgrading human capital is an essential component of measures for combatting de-industrialization (Rasiah 2011). Local professionals and specialists must be developed to achieve a sufficient supply of engineers, scientists, and researchers ready to apply innovative solutions in the chemical and other non-oil sectors. However, instead of creating a clear framework for attracting young and talented workers, Azerbaijan is experiencing a brain drain as they migrate to Turkey and Russia (Gurbanov 2014). As Abbasov (2007) asserted, participants in government-sponsored scholarship programs do not return to Azerbaijan because the government is unable to distribute them among the various sectors of the national economy. When low wages and poor rural development combine, the brain drain phenomenon becomes a serious threat to human capital (Abbasov 2007). Thus, Gurbanov (2014) called for the Azerbaijani government to prioritize the manufacturing sector to accumulate human capital. Otherwise, attracting FDI, establishing infrastructure, and opening special economic zones might not achieve the desired goals. Working-age people, especially young adults, are those most receptive to economic incentives to emigrate (Huang et al. 2002). If done properly, such incentives can easily solve the problem of a shortage of highly skilled labor. This will provide the impetus needed to develop non-oil tradeable manufacturing subsectors as well as counteract the de-industrialization of non-oil subsectors, which could already be occurring or be yet to occur.

Among the policy instruments related to industrial policy summarized by Acocella (2005: 191), two are of the utmost importance for supporting human capital formation in Azerbaijan, thus minimizing the negative impact of occasional oil booms (or DD effects). These are as follows: 1) "Development of a large-scale system of public education, R&D with close links between public research, public services (such as in the health sector) and public and private firms"; 2) "Creation of institutions in charge of setting standards and regulations for fostering the development of new industries." It is imperative that local economic policies that promote investment in human capital and increase labor productivity are developed and implemented, as they can create a competitive manufacturing sector and reverse the effects of DD (Perez–Claveria 2020). This also demonstrates how important services are to the process of industrialization in Azerbaijan.

As Peneder and Streicher (2018) noted, the role of the service sector is increasing due to its positive externalities and spillover effects on the manufacturing sector. As a result of national policies boosting the development of manufacturing productivity, each country must continue to seek new policies or copy those of other countries to strengthen its own unique advantages. If industrial policies target only national manufacturing sectors, the global decline in relative manufacturing prices will exacerbate rather than reverse de-industrialization, thereby contradicting proclaimed national goals of re-industrialization. Instead of focusing only on manufacturing, policymakers should also focus on raising services' productivity in the service sector.

In this context, Acocella (2005: 188) suggested the "provision of substantive public services (e.g. information, technical assistance, vocational training, and public research)" as well as the "public provision of infrastructure (e.g., roads, ports, urban infrastructure, telex networks)." Indeed, Azerbaijan must address the overarching non-oil de-industrialization through appropriate country-specific industrial policies. These should be supported by specialized services, such as R&D, design, and the protection of intellectual property rights. De-industrialization in non-resource sectors can be managed if institutional quality is high. Recent studies have demonstrated that the NRC occurs in countries with weak institutional quality; however, according to Amiri et al. (2019), this is not the case in countries with higher institutional quality. More specifically, commodity rents harm manufacturing growth in countries with low institutional quality but promote manufacturing growth in countries with high institutional quality.

Based on the ideas of Noman and Stiglitz (2015), Chang (2015), Simachev et al. (2018), and Cherif and Hasanov (2019), this study developed industrial policy recommendations for the Azerbaijani government; thus, the ongoing and upcoming negative impacts of the DD-induced de-industrialization of non-oil tradeable sectors can be minimized. This study's recommendations are as follows: 1) To reduce the risks of state capture and corruption, the necessary institutional mechanisms and framework must be created. This is usually one of the risks that prevent the introduction and application of industrial policies in countries with mineral resources. 2) Development banks should be established, which could be beneficial as the diversification of Azerbaijan's economy takes off and private actors become more active in non-oil sectors. Thus, the government could provide long-term investment at moderate interest rates to promote sustainable growth. For example, case studies of the Ethiopian economy presented by Girum and Schaefer (2015) demonstrated that the government can successfully use development banks to promote horticulture and leather goods manufacturing. 3) The government's export orientation in the chemical, petrochemical, and other non-oil manufacturing sectors could also be an effective policy for Azerbaijani companies, as the domestic market is small and import-substituting industrialization is not a real option. Thus, the government can push to be innovative and competitive. Currently, SOCAR is taking small steps. For example, Taiwan's state-owned refiner CPC Corp imported 1.05 million barrels of light Azerbaijani crude oil in 2022 (Quatrostrategies 2022). This indicates that not only neighboring countries (e.g., Georgia and Turkey) but also faraway countries could be potential buyers of industrial products if the necessary policy decisions are supported by real developments in non-oil production, especially in the chemical industry. 4) Tariffs and subsidies can be useful industrial policy tools for creating and protecting infant industries in the non-oil sector. To this end, excess oil revenues could be rechanneled to non-oil sectors. However, the government has generally chosen to use oil revenues for infrastructure projects—particularly in construction—rather than for high value-added production. Previous experiences with subsidies and government support have been accompanied by high levels of corruption and illegal practices. 5) Selective industrial policies targeting non-oil-tradeable sectors could bring quick results. Creating an enabling environment by improving institutions and building the state takes time. The emergence of export-oriented industrial sectors from this favorable environment could take even longer. Thus, both domestic production and exports could be diversified and, in turn, a diversified economy could ensure macroeconomic stability in Azerbaijan. Lebdioui (2020) stated that this argument is consistent with the idea that macroeconomic policies alone are not sufficient for ensuring macroeconomic stability in a resource-rich country. 6) Industrial policy instruments should not only stimulate the private sector of the economy through, for example, tax cuts and subsidies but also promote technological progress—either through domestic private actors or FDI. Naudé (2013) discussed the case of Indonesia—a country that successfully rid itself of DD—where SOEs dominated technology promotion and prevented the private sector of the economy, universities, and foreign companies transferring their experience to the domestic economy. According to Naudé (2013), this led to stagnation in manufacturing growth and created a supply-side industrial policy. Although the countries and economies of Azerbaijan and Indonesia are different, similarities do exist between the two resource-rich countries. The Azerbaijani government should strive for an optimal and efficient level of technology promotion to support the growth of domestic industry. 7) Horizontal industrial policy should aim to integrate Azerbaijan's regions into industrial production through the non-oil manufacturing sectors. The oil and chemical industries are located in the Absheron Economic Zone, where the capital city is located and the population density is high. There is a general lack of understanding of the regions' comparative advantages as well as of the possible strategies for integrating them into global and regional trends. With flexible regulation and appropriate risk optimization (e.g., through greater private sector participation and regional co-financing), cross-sectoral regional specialization in some manufacturing sectors could be achieved. Such specialization could increase the share of non-oil production.

6.3. A brief political economy perspective

Recent literature has focused on the political economy implications of the Azerbaijani government's resource-based preference for economic growth, particularly with regard to the mismanagement of oil revenues. Indeed, since the second half of the 1990s, scholars have warned the Azerbaijani government this (see Hoffman 1999; Laurila 1999). Nevertheless, the Azerbaijani government appears to have failed to embark on a macroeconomically favorable growth path, with many arguing that the use of oil revenues by the de facto authoritarian political regime favors certain SOEs, corrupt elites, and private companies linked to politicians (Bashirov 2021). In this way, the government intends to maintain its power, weaken civil society, and reduce public demand on the state. Roockwood (2022: 861) argues that oil revenues have been used "to consolidate the power and legitimacy of the president and his established monolithic and clientelistic political regime, whilst marking complex and ambitious nation-building projects." Similarly, Bashirov (2021) argues that large-scale redistribution of oil rents to citizens never occurred in Azerbaijan. Rather, the redistribution of oil revenues primarily benefited selected actors (e.g., SOEs, organizers of government sponsored sport events) in the national economy.

A particular focus of the political economy literature is the mismanagement of oil revenues in Azerbaijan. Rojo-Labaien (2020) and Roockwood (2022) argued about the government's rapid spending on major sporting events such as the European Games (2015), the Islamic Solidarity Games (2017), Formula One races, and several attempts to organize Olympic Games. After the record-breaking oil revenues, the Azerbaijani government focused mainly on gaining soft power domestically and abroad without strengthening domestic production capacity, which could be an important step to reduce the country's vulnerability to commodity price-based macroeconomic shocks (Rojo-Labaien 2020). In other words, the surge in oil revenues in 2011 and beyond provided a historic opportunity to restructure the oil-dependent economy. However, without inclusive strategies for the other parts of the country and the economy, the massive spending on sports infrastructure (e.g., the Athletes' Village, various stadiums) benefited only a handful of representatives of society. As a result, Azerbaijan is still a Baku-centered and oil-dependent country, which means that most of the value added is produced and consumed in Baku thanks to oil revenues.

Van Gills (2022) assessed Azerbaijan's policy performance in relation to the EU's Eastern Partnership (EaP) program, which reveals the real achievements and intentions of the political regime reformwise. For example, the values of political association and economic integration of the EaP were officially adopted on paper but never implemented in practice. In fact, Azerbaijan's cooperation with EU countries under the EaP focuses mainly on technical and economic aspects that, according to van Gill (2022), directly benefit the Azerbaijani regime itself. Value-based (e.g., political freedom, democracy) and people-centered reforms are scarce, and the reforms that have been implemented do not provide solutions to the problem of low economic development in the regions and non-oil sectors. Overall, it appears that the EaP (as a proxy for the government's actions and reforms) in Azerbaijan has performed poorly compared to the other EaP members since the beginning of the oil boom [with the exception of Belarus, van Gills (2022)].

As the primary beneficiary of oil revenues, the Azerbaijani government faces increasing challenges in diversifying the economy, as much of the oil revenues have already been spent and physical oil and natural gas reserves are rapidly depleting (Bashirov 2021). The mismanagement of oil revenues also goes hand in hand with inherited political principles from the Soviet era that do not guarantee a minimum level of prosperity for Azerbaijani citizens, as oil revenues are spent in a large-scale, inefficient, and patronage-based manner (Rojo-Labaien 2020). Currently, there is no significant political opposition which can demand the necessary reforms to rechannel oil revenues into vital parts of the economy. The governing authorities keep opposition actors in a “ghetto,” which is often virtual, and impose monopolistic control over civic activities according to Bedford and Vinatier (2019). Van Gills (2022) nicely describes why Azerbaijan has low institutional quality and a dependent economy due to political challenges:

> *“Economic cooperation in areas that enhance elites’ interests, notably energy export and the investment in new transport links, is supported by the regime. At the same time, economic reform that may reduce the government’s control over the economy, and hence threaten the elites’ economic interests, such as WTO accession on the EU’s terms, has been put of.”*

Thus, from some recent publications, we can learn that the political regime not only owns the extractive industry and regulates its key players, but also restricts the private sector and deliberately prevents reforms for "better" times in the future. Under these circumstances, selective industrial policies or other economic policy instruments may represent high inefficiencies rather than serious solutions to the de-industrialization of the non-oil sectors. Altenburg and Lütkenhorst (2015) discussed this situation as follows: It is possible for low- and middle-income countries to pursue successful industrial policies even in a weak institutional environment. However, latecomer countries usually need to establish the most basic market institutions first, such as creating a national entrepreneurial class and encouraging the formation of business associations, which increases the cost of policy implementation. Policymakers should first identify market failures, either in a particular sector or in factor markets (Maloney-

Nayyar 2018). Moreover, expanding government resources is a cornerstone of the productivity strategy to achieve better results. At the same time, government capacity needs to be strengthened to address coordination deficiencies and facilitate information gathering. There is also a need to improve the design of interventions, including in terms of robustness to weak information, implementation capacity, and political economy issues (Maloney-Nayyar 2018). Thus, the efficiency of policy implementation is more important than the dilemma of whether or not to implement an industrial policy, as an inappropriate policy may have worse outcomes than a non-intervention by the government (Maloney-Nayyar 2018).

Azerbaijan's industrial policy practice appears to be quite complicated, underdeveloped, inefficient, and lacking in political will and state capacity to implement it. However, this does not mean that the re-industrialization of non-oil manufacturing through industrial and selective policies should be neglected. "Low and lower-middle-income countries need to pursue proactive industrial policies to surmount the disadvantages of latecomer development" (Altenburg-Lütkenhorst 2015: 85). However, without political, institutional, and governance reforms, it seems difficult to imagine that the experience of de-industrialization in Azerbaijan will not be repeated in the foreseeable future. Therefore, in addition to the general guidelines mentioned above, much trial and error is required to determine the best industrialization path for each nation (Altenburg-Lütkenhorst 2015: 85). Ironically, Rodrik (2009) suggests asking not why but how when it comes to implementing industrial policy. Despite government inefficiency and insufficient political checks and balances, several low- and middle-income countries have embarked on a promising, albeit different, path (Altenburg-Lütkenhorst 2015: 85), and Azerbaijan can overhaul its current lopsided industrial structure. Much research is still needed to carefully analyze the underlying political economy considerations for industrial policy practice in Azerbaijan in the context of deindustrialization and re-industrialization processes.

6.4. Limitations and recommendations for future studies

Considering the results of this dissertation, some limitations and suggestions for future studies should be noted. The main limitation of the quantitative analysis was the lack of alternative theories to explain the possible negative impacts of the oil boom. DD and the NRC are common theories for modeling resource-rich, small, and open economies, but this also limits the ability to test whether the negative impacts are truly due to resource abundance. The small sample size and the limited ability to maneuver between explanatory variables were also main limitations of the quantitative analysis. Put differently, although new explanatory variables such as the EDI, oil rents, and oil boom (a dummy variable) were introduced to analyze DD effects and de-industrialization, real labor productivity, the impact of globalization, and the role of the service sector should also be included in the analysis when the available statistical data are introduced. In addition, the transition period had an enormous impact on the post-Soviet countries, which should also be included in analyses. Moreover, this study was limited to the linear effects of oil- or DD-related variables on institutional quality, the economy, and manufacturing subsectors. Although non-linear studies could be useful for elucidating other factors in Azerbaijan's economy, it is likely that variables such as oil price would lose value after a business cycle. This makes non-linear studies highly challenging.

Further studies could also focus on the other manufacturing subsectors outside of the chemical industry. Before the chemical industry was selected, the author also descriptively analyzed textiles and machinery, but the data did not reveal patterns of production decline that overlapped with the onset of the oil boom. Perhaps they require a more individualized approach. Therefore, sector-specific models for other non-oil manufacturing sectors must be found to explain the variations in output and employment. Next, this study used expert interviews as a qualitative method of data collection. In the future, this could be expanded in scope (i.e., more interviews) and subjected to thematic analysis to identify key themes emerging from the experts' opinions, in addition to their perception of the de-industrialization of the chemical and other non-oil manufacturing sectors. Quantitative analysis of such de-industrialization seems difficult due to a lack of public data and country-specific theories.

Another promising direction for future studies may be to incorporate the rent-seeking behavior of government officials and corporations into their models. Recent studies by Muradov (2022) and Sanili and Uste (2022) have asserted that rent-seeking behavior exists in Azerbaijan's economy. Indeed, rent-seeking behavior appears to be a starting point for the failure to successfully manage oil wealth in Azerbaijan, as some non-oil manufacturing subsectors have been deprived of government support and guidance since the beginning of the oil boom. The short-term orientation of companies with close ties to state officials and government representatives tends to flourish when oil prices rise. Thus, it is difficult for standard scientific social science methods to provide useful advice, and much room remains for conjecture rather than objective results.

Finally, it is crucial to analyze the de-industrialization process in Azerbaijan’s economy, in the context of not only the oil boom but also the collapse of the Soviet Union, since the main industrialization period fell during that time. For the output of Azerbaijani industrial producers, it is at least possible to obtain statistical data from Soviet archives and compare them with things that have changed over time and in the system. Through a descriptive analysis, Niftiyev (2022) found the subsectors of the textile industry to display signs of de-industrialization during the post-Soviet years, but not during the Soviet period. However, the exact reasons for and concrete details of this process remain for future studies to uncover.

The Republic of Azerbaijan was fortunate to have large oil and gas reserves during the transition period from a command economy to a market economy. Although oil reserves have led to dependency and negatively impacted the non-oil industry, it is not too late to overcome the challenges and structural problems in order to fully benefit from natural resources in the long term. If immediate action is not taken, oil dependence and de-industrialization will continue to increase. A further significant decline in commodity prices could threaten macroeconomic stability. However, the chemical industry can be a pilot industry to lead the diversification process and provide cheap inputs to other domestic producers. Hopefully, the government will take this into account and take industrial policy measures to minimize the negative impact of oil and gas-based production and exports.

REFERENCES

Abbasov V. M. – Abdullayev E. Ş. – Babayeva B. Ə. – Səfərova Ş. Z. (2015): Amidoaminlərin yol bitumuna aşqar kimi əlavə edilməsi [Addition of amidoamines to road bitumen as an additive]. 3rd International Scientific Conference of Young Researchers, 17-18 April, Baku, Azerbaijan.

Abbasov, I. – Aliyev, T. (2018): Qeyri-neft sənayesinin iqtisadiyyatı [Economics of non-oil industry]. Baku. Available at: https://www.ebooks.az/book_XJuO1g97.html Accessed: 01.02.2022.

Abbasov, S. (2007): Azerbaijan: Come back, kids. *Transitions Online*, 10(16), pp.1–4.

Abdenur, A. (2002): Tilting the north-south axis: The legitimization of southern development knowledge and its implications for comparative education research. *Current Issues in Comparative Education*, 4(2), pp. 57–69.

Abdlaziz, R. A. – Naseem, N. A. M. – Slesman, L. (2021): Oil revenue and agriculture value-added in oil-exporting countries: Does the role of real exchange rate matter? *International Journal of Energy Sector Management*, 16(1), pp. 171–190. doi: https://doi.org/10.1108/IJESM-11-2020-0006

Abdulahi, M. E. – Shu, Y. – Khan, M. A. (2019): Resource rents, economic growth, and the role of institutional quality: A panel threshold analysis. *Resources Policy*, 61, pp. 293–303.

Abdullayev, I. G. (2017): The power of small states: Azerbaijan and pipeline politics. *Theoretical & Applied Science*, 12(56), pp.146–150. doi: https://doi.org/10.15863/TAS.2017.12.56.23

Abel, A. B. – Mankiw, N. G. – Summers, L. H. – Zeckhauser, R. J. (1989): Assessing dynamic efficiency: Theory and evidence. *The Review of Economic Studies*, 56(1), pp. 1–19.

Acemoglu, D, – Johnson, S. – Robinson, J. (2003): An African success story: Botswana, In (Ed.) Rodrik, D., *Search of prosperity: Analytic narrative on economic growth*, Princeton University Press, Princeton, NJ, pp. 80–122.

Acemoglu, D. – Johnson, S. – Robinson, J. A. (2001): The colonial origins of comparative development: An empirical investigation. *American Economic Review*, 91(5), pp. 1369–1401. doi: https://doi.org/10.1257/aer.91.5.1369

Acemoglu, D. – Johnson, S. – Robinson, J. A. (2002): Reversal of fortune: Geography and institutions in the making of the modern world income distribution. *The Quarterly Journal of Economics*, 117(4), pp. 1231–1294. doi: https://doi.org/10.1162/003355302320935025

Acemoglu, D. – S. Johnson, – J. A. Robinson. (2005): Institutions as the fundamental cause of long-run growth, in P. Aghion and S. Durlauf (eds), *Handbook of Economic Growth*, Vol. 1, Amsterdam, Netherlands, pp. 385–472.

Acharya, A. (2007): Singapore's foreign policy: The search for regional order. Speech by Minister Mentor Lee Kuan Yew at the 37th Jawaharlal Nehru Memorial Lecture, New Delhi, 21 November 2005, "India in an Asian Renaissance", pp. 178-192. World Scientific Publishing Company.

Acocella, N. (2005): *Economic policy in the age of globalisation*. Cambridge University Press, Cambridge.

Adani, R. M. – Ricciuti, R. (2014): The resource curse, rule of law and accountability in African countries: A dynamic panel analys. *Economics Bulletin*, 34(3), pp. 1905–1916.

Adler, G. – Sosa, S. (2011): Commodity price cycles: The perils of mismanaging the boom (No. WP/11/283). *IMF Working Papers* (Vol. 11). https://doi.org/10.5089/9781463926649.001

Aftalion, F. (2001). A history of the international chemical industry. Chemical Heritage Foundation.

Agaev, I. (2012): Азербайджанская модель экономического развития и некоторые особенности современной финансовой политики республики [Azerbaijan model of economic development and some features of the modern financial policy of the republic], *Правовое поле современной экономики [Legal field of modern economy]*, 10, pp. 29–38.

Aghayev, R. (2021): Two new budget rules in three years. What changed and why? Available at: https://bakuresearchinstitute.org/en/two-new-budget-rules-in-three-years-what-changed-and-why/ Accessed: 12 December 2021

Ahmadov, I. – Mammadov, J. – Aslanli, K. (2013): Assessment of institutional quality in resource-rich Caspian basin countries. Available at: SSRN 2274813.

Ahmadov, I. (2016): Azerbaijan's new macroeconomic reality: How to adapt to low oil prices. Available at: http://dspace.khazar.org/handle/20.500.12323/3412 Accessed: 12 December 2021

Ahmadova, E. – Hamidova, L. – Hajiyeva, L. (2021): Diversification of the economy in the context of globalization (case of Azerbaijan). In SHS Web of Conferences (Vol. 92). EDP Sciences.

Ajide, F. M. – Soyemi, K. A. (2022): Oil rent, entrepreneurial start-ups, and institutional quality: Insights from African oil-rich countries. *Entrepreneurial Business and Economics Review*, 10(1), 35–49.

Ajide, K. B. (2022): Is natural resource curse thesis an empirical regularity for economic complexity in Africa?. Resources Policy, 76, 102755.

Akanbi, O. A. – Schoeman, N. J. (2010): The determinants of public expenditure and expenditure on education in particular in a selection of African countries. *South African Journal of Economic and Management Sciences* 13(1), pp. 50–61.

Alayli, M. A. (2005): Resource rich countries and weak institutions: The resource curse effect. Available at: https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.582.223&rep=rep1&type=pdf Accessed: 01 June 2022.

Albassam, B. A. (2015): Economic diversification in Saudi Arabia: Myth or reality? *Resources Policy*, 44, pp. 112–117.

Alderson, A. S. (1999): Explaining deindustrialization: Globalization, failure, or success. *American Sociological Review*, 64(5), pp. 701–721.

Alexandrowicz, M. R. (1994): *Vouchers in mass privatization programs*. World Bank, Private Sector Development, Washington, D.C

Alili, A. – Bittner, V. (2017): The cost of Azerbaijan's leaving the Extractive Industries Transparency Initiative (EITI): Analysis of the impact on the economy and civil society.

Aliyev K. – Dehning B. – Nadirov O. (2016): Modelling the impact of fiscal policy on non–oil GDP in a resource rich country: Evidence from Azerbaijan. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 64(6), pp. 1869–1878.

Aliyev, G. – Valiyev, A. – Rustamova, S. (2011): Social protection and social inclusion in Azerbaijan. Available at: http://dspace.khazar.org/bitstream/20.500.12323/1974/1/Report_SPSI%20in%20Azerbaijan_eng.pdf Accessed: 05 May 2022.

Aliyev, H. (2001): Kimya sənayesi müəssisələrinin və təşkilatlarının özəlləşdirilməsi haqqında Azərbaycan Respublikası Prezidentinin Sərəncamı [Order of the

President of the Republic of Azerbaijan on privatization of enterprises and organizations of the chemicals industry]. Available at: https://e-qanun.az/framework/4475 Accessed: 13.06.2022

Aliyev, H. (2002): Sahibkarlığın inkişafına mane olan müdaxilələrin qarşısının alınması haqqında Azərbaycan Respublikası Prezidentinin Fərmanı [Decree of the President of the Republic of Azerbaijan on the prevention of interference that hinders the development of entrepreneurship], № 790. Available at: http://www.e-qanun.az/framework/906 Accessed: 20 November 2021.

Aliyev, I. (2015): Sahibkarlıq sahəsində aparılan yoxlamaların dayandırılması haqqında Azərbaycan Respublikasının Qanunu [Law of the Republic of Azerbaijan on Cancellation of Inspections in the Field of Entrepreneurship], № 1410-IVQ. Available at: http://www.e-qanun.az/framework/31093 Accessed: 20 November 2021.

Aliyev, I. (2021): Azərbaycan 2030: sosial-iqtisadi inkişafa dair Milli Prioritetlər [Azerbaijan 2030: National Priorities for Socio-Economic Development] Available at: https://president.az/articles/50474 Accessed: 23 November 2021.

Aliyev, K. – Suleymanov, E. (2015): Macroeconomic analysis and graphical interpretation of Azerbaijan economy in 1991–2012. *Expert Journal of Economics*, 3(1), pp. 40-49.

Allen, M. – Caruana, J. (2008): Sovereign Wealth Funds—A work agenda. Available at: https://www.imf.org/external/np/pp/eng/2008/022908.pdf Accessed: 23 November 2021.

Almaz, A. (2015): Testing the rentier state theory: The case of Azerbaijan. *Journal of Global Analysis*, 5(1-2), pp. 59–72.

Alssadek, M. – Benhin, J. (2021): Oil boom, exchange rate and sectoral output: An empirical analysis of Dutch disease in oil-rich countries. *Resources Policy*, 74, 102362.

Altenburg, T. – Lütkenhorst, W. (2015): Industrial policy in developing countries: Failing markets, weak states. Edward Elgar Publishing.

Altstadt, A. L. (2017): *Frustrated democracy in post-soviet Azerbaijan*. Columbia University Press, New York.

Amir-Ahmadi, P. – Matthes, C. – Wang, M. C. (2020): Choosing prior hyperparameters: With applications to time-varying parameter models. *Journal of Business & Economic Statistics*, 38(1), pp. 124–136.

Amirbekov, F. F. O. (2015): [Амирбеков, Ф. Ф. О. (2015)]: Определение типа экономики Азербайджана [Determining the type of economy Azerbaijan]. *Экономическая наука современной России*, 2(69), pp. 122–136.

Amiri, H. – Samadian, F. – Yahoo, M. – Jamali, S. J. (2019): Natural resource abundance, institutional quality and manufacturing development: Evidence from resource-rich countries. *Resources policy*, 62, pp. 550–560.

Aras, O. N. – Suleymanov, E. – Mammadov, K. (2016): *Economy of Azerbaijan*. Sharg-Garb Publishing House, Baku.

Arezki, R. – van der Ploeg, R. (2007): Can the natural resource curse be turned into a blessing? The role of trade policies and institutions. *IMF Working Papers WP/07/55*.

Aridemir, H. (2018): Прямые инвестиции капитала в процессе расширения Турции на Южном Кавказе [Direct capital investment in the process of Turkey's enlargement in the South Caucasus]. *Manas Journal of Social Studies*, 7(1), pp. 515–537.

Ashton, D. – Green, F. – James, D. – Sung, J. (2005): *Education and training for development in East Asia: The political economy of skill formation in newly industrialised economies*. Routledge, London.

Aslanli, K. – Agayev, R. – Mehtiyev, A. – Ismayil, Z. (2013): Assessment of economic and export diversification: Azerbaijan. *Revenue Watch Institute Report*.

Aslanli, K. (2018): Azerbaijan: Civil society and the petroleum sector. In *Public Brainpower*, pp. 55–73, Palgrave Macmillan, Cham.

Attiah, E. (2019): The role of manufacturing and service sectors in economic growth: An empirical study of developing countries. *European Research Studies Journal*, 22(1), pp. 118–124.

Auty, R. (2001a): *Resource abundance and economic development*. Oxford University Press, Oxford.

Auty, R. M. – Furlonge, H. I. (2019): *The rent curse: Natural resources, policy choice, and economic development*. Oxford University Press, Oxford.

Auty, R. M. (2003): Third time lucky for Algeria? Integrating an industrializing oil-rich country into the global economy. *Resources Policy*, 29(1–2), pp. 37–47.

Awan, A. G. – Khan, R. E. A. (2015): Comparative analysis of the literature of economic growth in the perspective of advanced and emerging economies. *Science International*, 27(3), pp. 2579–2587.

Ayadi, O. F. (2005): Oil price fluctuations and the Nigerian economy. *OPEC review*, 29(3), pp. 199–217.

Azerbaijan Gazette (2019): Qeyri-neft sektoru ölkə iqtisadiyyatında mövqeyini möhkəmləndirir [The non-oil sector is strengthening its position in the country's economy], p.8. Available at: http://www.anl.az/down/meqale/azerbaycan/2019/fevral/632043.htm Accessed: 03 November 2021.

Azerbaijan Investment Holding – AIH (2021): About AIH. Available at: https://aih.gov.az/about-us/about-aih Accessed: 01 December 2021.

Azerbaijan State Statistical Committee (2014): *"Azərbaycan Respublikası regionlarının 2014–2018-ci illərdə sosial-iqtisadi inkişafı Dövlət Proqramı" haqqında [State Program of socio-economic development of the regions of the Republic of Azerbaijan in 2014–2018]*. Available at: https://www.stat.gov.az/source/regions/az/p3.pdf Accessed: 04 November 2021.

Azerbaijans. *Azərbaycanın kimya və neft-kimya sənayesi [Chemical and petrochemical industry of Azerbaijan]*. Available at: https://www.azerbaijans.com/content_723_az.html Accessed: 01 February 2022

Azertag (2013): *"Azərneftyağ" NEZ-in bitum qurğusunda təmir işləri aparılacaqdır [The bitumen plant of the "Azerneftyag" oil refinery will be repaired]*. Available at: https://azertag.az/xeber/Azerneftyag_NEZ_in_bitum_qurgusunda_temir_isleri_aparilacaqdir-207098?device=Desktop Accessed: 10 June 2022.

Azertag (2014): *Azərbaycan metallurgiyasının flaqmanı - "Baku Steel Company" əsaslı yenidənqurmadan sonra istehsalı dörd dəfə artırıb ["Baku Steel Company", the flagship of Azerbaijani metallurgy, has quadrupled production after major overhaul]*. Available at: https://azertag.az/xeber/Azerbaycan_metallurgiyasinin_flaqmani___Baku_Steel_Company_esasli_yenidenqurmadan_sonra_istehsali_dord_defe_artirib_VIDEO-75366 Accessed: 10 June 2022

Aziz, O. G. (2022): FDI inflows and economic growth in Arab region: The institutional quality channel. *International Journal of Finance & Economics*, 27(1), 1009–1024.

Azizov, M. (2021): Deindustrialization during the postsocialist transition in Azerbaijan: A comparative study with the Czech Republic and Norway. Masaryk University, Bachelor Thesis.

Azom, E. (2022): Testing and estimating a DSGE model via indirect inference: tackling the Dutch Disease in Kuwait (Doctoral dissertation, Cardiff University).

Badeeb, R. – Lean, H. H. – Clark, J. (2016): The evolution of the natural resource curse thesis: A critical literature survey. *Resources Policy*, 51, pp. 123–134.

Bagirov, S. (1996): Azerbaijani oil: glimpses of a long history. *Perceptions: Journal of International Affairs*, 1(3), pp. 1–15.

Bahar, D. – Santos, M. A. (2018): One more resource curse: Dutch disease and export concentration. *Journal of Development Economics*, 132, pp. 102–114.

Bahgat, G. (2011): Sovereign Wealth Funds in the Gulf: an assessment. Kuwait Programme on Development, Governance and Globalisation in the Gulf States (16). The London School of Economics and Political Science, London, UK.

Bahmani-Oskooee M. – Jamilov R. (2014): Export diversification and the S-curve effect in a resource-rich state: evidence from Azerbaijan. *Economic Change and Restructuring*, 47(2), pp. 135–154.

Balassa, B. (1980): *The process of industrial development and alternative development strategies*, Princeton University Press, Princeton.

Baldacci, E. – Clements, B. – Gupta, S. – Cui, Q. (2008): Social spending, human capital, and growth in developing countries. *World development*, 36(8), pp. 1317–1341.

Banbura, M. – Giannone, D. – Reichlin, L. (2010): Large Bayesian vector autoregressions. *Journal of Applied Econometrics*, 25(2), pp. 71–92.

Bandiera, L. – Budina, N. – Wijnbergen, S. (2008): “How to” of fiscal sustainability in oil-rich countries: The case of Azerbaijan. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1996482 Accessed: 12 November 2021.

Baranick, M. J. – Salayeva, R. (2005): State-building in a transition period: The case of Azerbaijan. The Cornwallis group x: Analysis for new and emerging societal conflicts, pp. 208–219.

Barder, O. M. (2006): A policymakers' guide to Dutch disease. *Center for Global Development Working Paper*, 91.

Barrios, J. J. (2015): “I think competition is better than you do: Does it make me happier?” Evidence from the World Value Surveys. *Journal of Happiness Studies*, 16(3), pp. 599–618.

Barro, R. J. – Sala-i-Martin, X. (1995): *Economic growth*. McGraw-Hill, New York.

Barro, R. J. (2001): Human capital and growth. *American Economic Review*, 91(2), pp. 12–17.

Bashirov, G. (2021): New extractivism and failed development in Azerbaijan. *Third World Quarterly*, pp. 1–20.

Bator, F. M. (1958): The anatomy of market failure. *The quarterly Journal of Economics*, 72(3), pp. 351–379.

Bayraç, H. N. – Çemrek, F. (2019): Hazar bölgesi’nde enerji üretimi ile ekonomik büyüme arasindaki nedensellik ilişkisi ve Hollanda hastaliği: Azerbaycan, Kazakistan ve Türkmenistan örneği [The causality relationship between energy production and economic growth in the caspian region and the Dutch disease: the case of Azerbaijan, Kazakhstan and Turkmenistan]. *Avrasya Sosyal ve Ekonomi Araştırmaları Dergisi*, 6(10), pp. 148–164.

Bayramov, V. – Abbas, G. (2017): Oil shock in the Caspian Basin: Diversification policy and subsidized economies. *Resources Policy*, 54, pp. 149–156.

Bayramov, V. (2009): *Ending dependency: How is oil revenues effectively used in Azerbaijan*. Baku, Azerbaijan, ISBN, 978-9952.

Bayramov, V. (2016): Azerbaijan economy in 2015: New opportunities for further diversification. *Journal of Economic Sciences: Theory & Practice*, 73(1), pp. 45–51.

Bayramov, V. (2020): Social consequences of the oil price shock in the resource rich post-Soviet countries. *CESD Research Group*. doi: http://dx.doi.org/10.2139/ssrn.3598521

Bayulgen, O. (2005): Foreign investment, oil curse, and democratization: A comparison of Azerbaijan and Russia. *Business and Politics*, 7(1), pp. 1–37.

Bedford, S. – Vinatier, L. (2019): Resisting the irresistible:‘Failed opposition’in Azerbaijan and Belarus revisited. *Government and Opposition*, *54*(4), 686–714.

Benhabib, J. – Spiegel, M. (1994): The role of human capital in economic development: Evidence from aggregate cross-country data. *Journal of Monetary Economics*, 34(2), pp.143–74.

Benkhodja, M. T. (2014): Monetary policy and the Dutch disease effect in an oil exporting economy. *International Economics*, 138, pp. 78–102.

Bernardini, E. (2017): Italy-Azerbaijan relations: An analysis by means of social networks. *Geopolitical, Social Security and Freedom Journal*, 1(2), pp. 66–75.

Beverelli, C. – Dell'Erba, S. – Rocha, N. (2011): Dutch disease revisited. Oil discoveries and movements of the real exchange rate when manufacturing is resource-intensive. *International Economics and Economic Policy*, 8(2), pp. 139–153.

Bhattacharyya, S. – Collier, P. (2014): Public capital in resource rich economies: Is there a curse? *Oxford Economic Papers*, 66(1), pp. 1–24.

Bhatty, R. S. (2002): Tough choices: Observations on the political economy of Armenia, Azerbaijan, and Georgia. *Unpublished World Bank report*.

Biresselioglu, M. E. – Demir, M. H. – Gonca, A. – Kolcu, O. – Yetim, A. (2019): How vulnerable are countries to resource curse? A multidimensional assessment. *Energy Research & Social Science*, 47, pp. 93–101.

Bloom, D. E. – Canning, D. – Sevilla, J. (2004): The effect of health on economic growth: A production function approach. *World Development*, 32(1), pp. 1–13.

Bluestone, B. (1984): Is deindustrialization a myth? Capital mobility versus absorptive capacity in the US economy. *The Annals of the American Academy of Political and Social Science*, 475(1), pp. 39–51.

Bogetic, Z.–Smits, K.–Budina, N.–van Wijnbergen, S. (2010): Long-term fiscal risks and sustainability in an oil-rich country: the case of Russia. World Bank Policy Research, Working Paper, No. 5240.

Bogliaccini, J. A. (2013): Trade liberalization, deindustrialization, and inequality: Evidence from middle-income Latin American countries. *Latin American Research Review*, 48(2), pp. 79–105.

Bonilla-Chacin, M. E. – Afandiyeva, G. – Suaya, A. (2018): *Challenges on the path to universal health coverage: The experience of Azerbaijan*. World Bank, Washington DC.

Bosco, B. – Poggi, A. (2020): Middle Class, Government Effectiveness and Poverty in the EU: A Dynamic Multilevel Analysis. *Review of Income and Wealth*, 66(1), 94–125.

Boyarchuk, D. (2012): Azerbaijan's fiscal policy after the oil boom. *World Bank*, *02*, 3.

Brahmbhatt, M. – Canuto, O. – Vostroknutova, E. (2010): Dealing with Dutch disease.

Braun, M. – Behr, D., Kaczmirek, L. – Bandilla, W. (2014): Evaluating cross-national item equivalence with probing questions in web surveys. *Improving survey methods: lessons from recent research*, pp. 184–200.

Brettel, M. – Friederichsen, N. – Keller, M. – Rosenberg, M. (2014): How virtualization, decentralization and network building change the manufacturing landscape: An Industry 4.0 Perspective. *International Journal of Information and Communication Engineering*, 8(1), pp. 37–44.

Bro, R. – Smilde, A. K. (2014): Principal component analysis. *Analytical Methods*, 6(9), pp. 2812–2831

Brollo, F. – Nannicini, T. – Perotti, R. – Tabellini, G. (2013): The political resource curse. *American Economic Review*, 103(5), 1759–1796.

Brückner, M. – Ciccone, A. – Tesei, A. (2012): Oil price shocks, income, and democracy. *Review of Economics and Statistics*, 94(2), pp. 389–399.

Budina, N. – van Wijnbergen, S. (2008): Managing oil revenue volatility in Nigeria: The role of fiscal policy. *Africa at a turning point? Growth, aid and external shocks*, pp. 427–459

Bulte, E. – Damania, R. – Deacon, R. (2005): Resource intensity, institutions, and development. *World Development*, 33(7), pp. 1029–1044.

Bunte, J. B. (2016): Wage bargaining, inequality, and the Dutch disease. *International Studies Quarterly*, 60(4), pp. 677-692.

Burnett, J. W. – Bergstrom, J. C. – Wetzstein, M. E. (2013): Carbon dioxide emissions and economic growth in the US. *Journal of Policy Modeling*, 35(6), pp. 1014–1028.

Busemeyer, M. R. (2007): Determinants of public education spending in 21 OECD democracies, 1980–2001. *Journal of European Public Policy* 14(4), pp. 582–610.

Busse, M. (2012): Property. In *A handbook of economic anthropology*. Ed. J. Carrier, pp.111–127. Cheltenham: Edward Elgar.

Cantore, N. – Clara, M. – Lavopa, A. – Soare, C. (2017): Manufacturing as an engine of growth: Which is the best fuel? *Structural Change and Economic Dynamics*, 42, pp. 56–66.

Carneiro, F. (2007): Development challenges of resource-rich countries: the case of oil exporters. In *Proceedings of the VI International Colloquium*, pp. 115–140.

Caselli, F. – G. Esquivel, – F. Lefort (1996): Reopening the convergence debate: A new look at cross-country growth empirics. *Journal of Economic Growth*, 1(3), pp. 363–389.

Castelló, A. – Doménech, R. (2002): Human capital inequality and economic growth: Some new evidence. *The Economic Journal*, 112(478), pp. 187–200.

Castells, M. (1998): *End of millennium*. Blackwell Publishers, Malden, MA.

CESD – Center for Economic and Social Development (2007): Strategy for state oil fund of Azerbaijan Republic. Available at: Accessed: https://www.cesd.az/wp/Strategy_Paper_SOFAZ_CESD.pdf 01 February 2020.

Chandramowli, S. – Lahr, M. L. (2012): Forecasting New Jersey's electricity demand using auto-regressive models. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2258552 Accessed: 21 March 2021.

Chang, H. J. (2015): Is industrial policy necessary and feasible in Africa? In *Industrial policy and economic transformation in Africa*, pp. 30-52, Columbia University Press, New York.

Chantzi, G. (2013): The emergence of Azerbaijan as regional leader. *ICBSS Policy Briefs*, 28.

Chebab, D. – Mazlan, N. S. – Rabbani, M. R. – Chin, L. – Ogiri, A. I. (2022): The Role of Corruption in Natural Resource-Financial Development Nexus: Evidence from MENA Region. *Institutions and Economies*, 1–29.

Chen, C. – Reniers, G. (2020): Chemical industry in China: The current status, safety problems, and pathways for future sustainable development. *Safety science*, *128*, 104741.

Chenery, H. (1979): *Structural change and development policy*. Oxford University Press, Oxford.

Cherif, R. – Hasanov, F. (2019): The return of the policy that shall not be named: Principles of industrial policy. *Working paper*, 19/74. International Monetary Fund, Washington DC, the USA.

Cherif, R. (2013): The Dutch disease and the technological gap. *Journal of Development Economics*, 101, pp. 248–255.

Choudhury, H. – Cary, R. (2001): Barium and barium compounds. World Health Organization. Available at:

https://apps.who.int/iris/bitstream/handle/10665/42398/9241530332.pdf Accessed: 01 April 2022.

Chubrik, A. – Walewski, M. (2010): Oil money vs. economic crisis: The case of Azerbaijan. *CASE Network E-Briefs*, 6, pp.1–4.

Ciarreta, A. – Nasirov, S. (2010): Analysis of Azerbaijan oil and gas sector. *United States Association for Energy Economics Research Paper Series*, 43–46.

Ciarreta, A. – Nasirov, S. (2012): Development trends in the Azerbaijan oil and gas sector: Achievements and challenges. *Energy Policy*, 40, pp. 282–292.

Ciuriak, D. (2014): Diagnosing Dutch Disease. *Available at SSRN 2540108*.

Clark, C. (1941): *The Conditions of Economic Progress*. Macmillan, London.

Clark, C. (1957): *The Conditions of Economic Progress*. 3rd edition, Macmillan, London.

Clemens, M. (2007): *Azerbaijan between resource curse and foreign direct investments*. Univ., Department of Economics.

Cockx, L. – Francken, N. (2016): Natural resources: a curse on education spending? *Energy Policy*, 92, 394-408.

Collier, P. – Goderis, B. (2007): Commodity prices, growth, and the natural resource curse: reconciling a conundrum. Centre for the Study of African Economies Working Paper No.274. http://dx.doi.org/10.2139/ssrn.1473716

Collier, P. – Hoeffler, A. – Rohner, D. (2009): Beyond greed and grievance: Feasibility and civil war. Oxford Economic Papers 61(1), pp. 1–27.

Collier, P. – Hoeffler, A. (1998): On the economic causes of civil war. *Oxford Economic Papers*, 50(4), pp. 563–573.

Conrad, J. F. (2012): Azerbaijan: Financial sector assessment. *CWRD Paper Series*, Asian Bank of Development.

Corden, W. M. – Neary, J. P. (1982): Booming sector and de-industrialisation in a small open economy. *The Economic Journal*, 92(368), pp. 825–848.

Corden, W. M. (1984): Booming sector and Dutch disease economics: survey and consolidation. *Oxford Economic Papers*, 36(3), pp. 359–380.

Cornell, S. E. (2015): *Azerbaijan since independence*. Routledge, London.

Cornwall, J. (1977): *Modern capitalism*. St. Martin’s Press, New York.

Cortés Serrano, D. – Chavarría-Barrientos, D. – Ortega, A. – Falcón, B. – Mitre, L. – Correa, R. – Molina Gutiérrez, A. (2018): A framework to support Industry 4.0:

Chemical company case study. In Working Conference on Virtual Enterprises (pp. 387–395). Springer, Cham.

Cowen, M. – Shenton, R. (1996): *Doctrines of development*. Routledge, London.

Cucciniello, R. – Cespi, D. (2018): Recycling within the chemical industry: The circular economy era. *Recycling*, 3(2), 22.

Cypher, J. – Dietz, J. (2008): *The process of economic development*. Routledge, New York.

Dakkoune, A. – Vernières-Hassimi, L. – Leveneur, S. – Lefebvre, D. – Estel, L. (2018): Risk analysis of French chemical industry. *Safety Science*, 105, pp. 77–85.

Daniele, V. (2011): Natural resources and the 'quality'of economic development. *the Journal of Development Studies*, 47(4), pp. 545–573.

Datta-Chaudhuri, M. (1990): Market failure and government failure. *Journal of Economic Perspectives*, 4(3), pp. 25–39.

Davis, J. – Ossowski, R. – Daniel, J. – Barnett, S. (2001): Oil funds: Problems posing as solutions? *Finance and Development*, 38(4), pp. 56–59.

Davis, J. – Ossowski, R. – Daniel, J. A. – Barnett, S. (2003): Stabilization and savings funds for nonrenewable resources: Experience and fiscal policy implications. Fiscal policy formulation and implementation in oil-producing countries, pp. 273–315.

De Broeck M. – Sløk, T. (2001): Interpreting real exchange rate movements in transition countries. *IMF Working Paper*, No. 56.

De Long, J. B. – J. G. Williamson (1994): Natural resources and convergence in the nineteenth and twentieth centuries. *Unpublished paper*, Harvard University.

de Medeiros Costa H. K. – dos Santos, E. M. (2013): Institutional analysis and the "resource curse" in developing countries. *Energy Policy*, 63, pp. 788–795.

De Mol, C. – Giannone, D. – Reichlin, L. (2008): Forecasting using a large number of predictors: is Bayesian shrinkage e a valid alternative to principal components? *Journal of Econometrics*, 146(2), pp. 318–328.

de Soysa, I. – Gizelis, T. I. (2013): The natural resource curse and the spread of HIV/AIDS, 1990–2008. *Social Science and Medicine*, 77, pp. 90–96.

de Vries, G. – Timmer, M. – de Vries, K. (2015): Structural transformation in Africa: Static gains, dynamic losses. *The Journal of Development Studies*, 51, pp. 674–688.

Deacon, R. T. – Rode, A. (2015): Rent seeking and the resource curse. In *Companion to the political economy of rent seeking*. Edward Elgar Publishing, The Lypiatts.

Deacon, R. T. (2011): The political economy of the natural resource curse: A survey of theory and evidence. *Foundations and Trends in Microeconomics*, 7(2), pp. 111–208.

Dell'Anno, R. – Maddah, M. (2022): Natural resources, rent seeking and economic development. An analysis of the resource curse hypothesis for Iran. *Macroeconomics and Finance in Emerging Market Economies*, 15(1), 47–65.

Di John, J. (2011): Is there really a resource curse? A critical survey of theory and evidence. *Global governance*, 17(2), pp. 167–184.

Dien, J. (2010): Evaluating two-step PCA of ERP data with geomin, infomax, oblimin, promax, and varimax rotations. *Psychophysiology*, 47(1), pp. 170–183.

Dikkaya, M. – Doyar, B. V. – Kanbir, O. (2018): The effects of oil prices on Turkey's foreign trade relations to Azerbaijan. *Review of Socio-Economic Perspectives*, 3(2), pp.153–164.

Ding, N. – Field, B. C. (2005): Natural resource abundance and economic growths. *Land Economics*, 81(4), pp. 496–502.

Doeksen, G. A. – Johnson, T. – Biard-Holmes, D. – Schott, V. (1998): A healthy health sector is crucial for community economic development. *The Journal of Rural Health*, 14(1), pp. 66–72.

Doing Business 2004 (2003): World Bank Group. Available at: https://www.doingbusiness.org/en/reports/global-reports/doing-business-2004 Accessed: 04 November 2021.

Doytch, N. – Uctum, M. (2011): Does the worldwide shift of FDI from manufacturing to services accelerate economic growth? A GMM estimation study. *Journal of International Money and Finance*, 30(3), pp. 410–427.

Dunning, T. (2008): *Crude democracy: Natural resource wealth and political regimes*. Cambridge University Press, New York.

EBRD – European Bank for Reconstruction and Development (1999): Report 1999: Ten years of transition. economic transition in Central and Eastern Europe, the Baltic States, and the CIS, EBRD, London. Available at: https://www.ebrd.com/downloads/research/transition/TR99.pdf Accessed: 12.06.2021.

EBRD – European Bank of Reconstruction and Development. (1995): Transition report 1995. Available at: https://www.ebrd.com/publications/transition-report-1995-english.pdf Accessed: 09 November 2021.

EBRD – European Bank of Reconstruction and Development. (1997): Transition report 1995. EBRD, London Available at: https://www.ebrd.com/cs/Satellite?c=Content&cid=1395248976777&d=&pagename=EBRD%2FContent%2FDownloadDocument Accessed: 09 November 2021.

EBRD – European Bank of Reconstruction and Development. (2000): Transition report 2000. EBRD, London. Available at: https://www.ebrd.com/publications/transition-report-2000-english.pdf Accessed: 09 November 2021.

EBRD – European Bank of Reconstruction and Development. (2000): Transition report 2000 – Business in transition. EBRD, London. Available at: https://www.ebrd.com/publications/transition-report-2000-english.pdf Accessed: 09 November 2021.

EBRD – European Bank of Reconstruction and Development. (2003): Transition report – Integration and regional cooperation. EBRD, London. Available at: https://www.ebrd.com/publications/transition-report-2003-english.pdf Accessed: 11 November 2021.

EBRD – European Bank of Reconstruction and Development. (2004): Transition report – Infrastructure. EBRD, London. Available at: https://www.ebrd.com/publications/transition-report-2004-english.pdf Accessed: 11 November 2021.

EBRD – European Bank of Reconstruction and Development. (2006): Transition report – Finance in transition. EBRD, London. Available at: https://www.ebrd.com/publications/transition-report-2006-english.pdf Accessed: 11 November 2021.

EBRD – European Bank of Reconstruction and Development. (2008): Transition report 2008 – Growth in transition. EBRD, London. Available at: https://www.ebrd.com/publications/transition-report-2008-english.pdf Accessed: 09 November 2021.

EBRD – European Bank of Reconstruction and Development. (2014): Transition report 2014 – Innovation in transition. EBRD, London. Available at:

https://www.ebrd.com/publications/transition-report-2014-english.pdf Accessed: 10 November 2021.

EBRD – European Bank of Reconstruction and Development. (2020): Country assesments 2020–21. EBRD, London. Available at: https://www.ebrd.com/publications/transition-report-202021-azerbaijan Accessed: 10 November 2021.

EEI – Eurasia Extractive Industries (2018): State-owned oil company case studies: SOCAR. Available at: https://eurasiahub.khazar.org/uploads/publications/pdf/EN_SOCAR.pdf Accessed: 10 May 2021.

EEI – Eurasia Extractive Industries (2019a): Assessment of legal and institutional opportunities and barriers to the effective application of the medium term expenditure framework in Azerbaijan. Available at: https://eurasiahub.khazar.org/en/view_publication/15 Accessed 11 November 2019.

EEI – Eurasia Extractive Industries (2019b): Azerbaijan has started implementation of fiscal rules. Available at: https://eurasiahub.khazar.org/uploads/publications/pdf//Summary_EN_Fiscal_Rules.pdf Accessed: 01 May 2022.

Eerd, R. van. (2010): Of Dutch disease and other ailments. *Bologna Center Journal of International Affairs*, 13, pp. 99–112.

Egert, B. (2012): Dutch Disease in the post-Soviet countries of Central and South-West Asia: How contagious is it? *Journal of Asian Economics*, 23(5), pp. 571–584.

Embrahim-Zadeh, C. (2003): Back to basics–Dutch disease: Too much wealth managed unwisely. *Finance and Development*, 40(1), pp. 50–51.

Engerman, S. – Sokoloff K. (1997): Factor endowments, institutions and differential paths to growth among new world economies: A view from economic historians in the united states. In (Ed.) Haber S., *How Latin America Fell Behind: Essays on the Economic Histories of Brazil and Mexico, 1800-1914*, Stanford University Press, Standford, pp. 260–306.

Erumban, A. A. – de Vries, G. (2021): Industrialization in developing countries: Is it related to poverty reduction? *Working paper*, No. wp-2021-172, World Institute for Development Economic Research (UNU-WIDER).

Esanov, A. – Raiser, M. – Buiter, W. (2005): Nature's blessing or nature's curse? In *Energy, Wealth and Governance in the Caucasus and Central Asia*, (Eds.) Auty, R. – de Soysa I., Central Asia Research Forum, pp.39–56.

Espinoza, R. – Fayad, G. – Prasad, A. (2013): *The macroeconomics of the Arab States of the Gulf*. Oxford University Press, Oxford.

Fagerberg, J. – Mowery, D. – Verspagen, B. (2009): The evolution of Norway's national innovation system, *Science and Public Policy*, 36(6), pp. 431–44

Fagerberg, J. – Verspagen, B. (1999): 'Modern Capitalism' in the 1970s and 1980s. In Setterfield, M. (Ed). *Growth, employment and inflation*. London: Palgrave Macmillan, pp. 113–126.

Fagerberg, J. – Verspagen, B. (2002): Technology-gaps, innovation-diffusion and transformation: an evolutionary interpretation. *Research Policy*, 31(8–9), pp. 1291–1304.

Fariss, C. J. (2019): Yes, human rights practices are improving over time. *American Political Science Review*, 113(3), pp. 868–881.

Farzanegan, M. R. (2014): Can oil-rich countries encourage entrepreneurship? *Entrepreneurship & Regional Development*, 26(9-10), pp. 706–725.

Felipe, J. – Mehta, A. (2016): Deindustrialization? A global perspective. *Economics Letters*, 149, pp. 148–151.

Flegel, T. (2012): The impact of the transparency initiative in Azerbaijan. *Dynamiques Internationales*, (6), pp. 1–29.

Frank, A. G. (1967): *Capitalism and underdevelopment in Latin America*. Monthly Review Press, New York.

Franke, A. – Gawrich, A. – Alakbarov, G. (2009): Kazakhstan and Azerbaijan as post-Soviet rentier states: Resource incomes and autocracy as a double 'curse' in post-Soviet regimes. *Europe-Asia Studies*, 61(1), pp. 109–140.

Franke, A. – Gawrich, A. (2010): Autocratic stability and post-Soviet rentierism: The cases of Azerbaijan and Kazakhstan. In *Are Resources a Curse*, (Eds.) Gawrich. A. – Franke, A. – Windwehr, J., (pp. 71–99). Barbara Budrich Publishers, Leverkusen Opladen, Germany.

Frayne, T. (2012): Energy sector FDI in Azerbaijan: An example of good governance? *E-international Relations*. Available at: https://www.e-ir.info/2012/08/05/energy-sector-fdi-in-azerbaijan-an-example-of-good-governance/ Accessed: 01 December 2020.

Friedman, T. (2006): The first law of petropolitics. *Foreign Policy*, 154, 28.

Fuchs, V. R. (1980): Economic growth and the rise of service employment. *Working paper*, 0486. National Bureau of Economic Research, Cambridge MA, the USA.

Gahramanov, E. – Fan, L. S. (2002): The Dutch disease in Caspian region: The case of Azerbaijan republic. *Economic Studies*, 5(10), pp. 9–30.

Gamidova, A. M. (2017): Современные проблемы и аспекты развития логистической системы в химических предприятиях Азербайджана [Modern problems and aspects of the development of the logistics system in the chemical enterprises of Azerbaijan]. *Theoretical & Applied Science*, 8(52), pp. 80–84.

Gardner, B. (2009): Incentivised snowballing. *The Psychologist*, 22(9), pp. 768–769.

Gelb, A. (2010): Economic diversification in resource rich countries. Center for Global Development, International Monetary Fund, Washington DC.

Gelb, A. H. (1988): *Oil windfalls: blessing or curse?* (Published for the World Bank). Oxford University Press, New York.

Gereffi, G. – Fernandez-Stark, K. (2011): Global value chain analysis: a primer. *Center* on Globalization, Governance & Competitiveness (CGGC), Duke University, North Carolina, USA.

Ghazvinian, J. (2007): *Untapped: The scramble for Africa's oil*. Harcourt, New York.

Gilberthorpe, E. – Papyrakis, E. (2015): The extractive industries and development: The resource curse at the micro, meso and macro levels. *The extractive industries and society*, 2(2), pp. 381–390.

Girum, A. – Schaefer, F. (2015): Review of industrial policies in Ethiopia: A perspective from the leather and flower industries. In *Industrial policy and economic transformation in Africa*. Columbia University Press New York.

Glaeser, E. L. – La Porta, R. – Lopez-de-Silanes, F. – Shleifer, A. (2004): Do institutions cause growth? *Journal of economic Growth*, 9(3), pp. 271–303.

Goldin, C. D. (2016): Human capital. In (Ed.) Diebolt, C. – Haupert, M. *Handbook of cliometrics*, Heidelberg, Germany, Springer Verlag, pp. 55–86.

Gollin, D. (2010): Agricultural productivity and economic growth. In *Handbook of agricultural economics*, 4, pp. 3825–3866.

Gombodorj, G. – Pető, K. (2022): Impact Of The Mining And Agriculture Sector On The Mongolian Economy. *Oradea Journal of Business and Economics*, 7(1), 74–85.

Gomez, M. R. – Casper, S. – Smith, E. A. (2008): The CSB incident screening database: Description, summary statistics and uses. J. Hazard. Mater., Papers Presented at the 2006 Annual Symposium of the Mary Kay O'Connor Process Safety Center 159, 119–129.

Gregory, D. – Johnston, R. – Pratt, G. – Watts, M. – Whatmore, S. (eds.) (2009): The dictionary of human geography. John Wiley & Sons, Malden and Oxford, pp. 380–382.

Gulbrandsen, L. H. – Moe, A. (2007): BP in Azerbaijan: A test case of the potential and limits of the CSR agenda? *Third World Quarterly*, 28(4), pp. 813–830.

Guliyev, F. (2009): Oil wealth, patrimonialism, and the failure of democracy in Azerbaijan. *Caucasus Analytical Digest*, (2), pp. 2–5.

Guliyev, F. (2013): Oil and regime stability in Azerbaijan. *Demokratizatsiya*, 21(1), pp. 113–147.

Guliyev, F. (2016): Azerbaijan: Low oil prices and their social impact. *Caucasus Analytical Digest*, (83).

Guliyev, M. (2020): Accelerating economic diversification in Azerbaijan: Challenges, shaping prospects. In 56th International Scientific Conference on Economic and Social Development–Aveiro.

Guliyeva, S. – Gadimli, N. – Azizov, Y. – Hajiyev, Z. – Bayramov, S. (2021): Fiscal policy effectiveness and risks in the development of Azerbaijan's economy during economic shock. *Journal of Eastern European and Central Asian Research (JEECAR)*, 8(2), pp. 171–183.

Güneş, M. (2020): The stages of development of the transition economy: The case of Azerbaijan. *International Journal of Academic Research in Economics and Management Sciences*, 9(2), pp. 89–101.

Gunesch, K. (2018): The natural resource curse: A socioeconomic and sociopolitical analysis of causes and symptoms combined with macroeconomic solution suggestions for international development policy and practice. *Review of Socio-Economic Perspectives*, 3(1), pp. 73–95.

Gurbanov, S. – Nugent, J. B. – Mikayilov, J. (2017): Management of oil revenues: Has that of Azerbaijan been prudent? *Economies*, *5*(2), 19.

Gurbanov, S. (2013): Declining manufacturing employment as a global social change: Implications for Azerbaijan. In International Conference on" Policy Options for Social Market Economy: National and International Perspectives"-Center for

Economic and Social Development (CESD) & Konrad Adenauer Stiftung & Qafqaz University.

Gurbanov, S. (2014): Migration and brain drain: Survey for the Azerbaijan economy. *Journal of Qafqaz University-Economics and Administration*, 2(1), pp. 3–13.

Gylfason T. (1984): Lessons from the Dutch disease: Causes, treatment, and cures. *Oxford Economic Papers*, 36(3), pp. 359–380.

Gylfason, T. – Zoega, G. (2018): The Dutch disease in reverse: Iceland's natural experiment. In (Ed.) Paganetto, L., *Getting Globalization Right*. Springer, Cham, pp. 13–36.

Gylfason, T. (2001): Natural resources, education, and economic development. *European Economic Review*, 45(4-6), pp. 847–859.

Habibov, N. – Auchynnika, A. (2018): Unequal access to healthcare and unofficial under-the-table out-of-pocket payments. *Caucasus Analytical Digest (CAD)*, 103, pp. 2–5.

Hailu, D. – Kipgen, C. (2017): The Extractives Dependence Index (EDI). *Resources Policy*, 51, pp. 251–264

Hamidova, L. (2018): Diversification of the economy of Azerbaijan: How to overcome resource dependence? *Sosyoekonomik Boyutlarıyla İnovasyon*, MCBÜ Yayınları Yayın No: 34, pp. 11–18.

Hamidova, L. (2020): Diversification of the economy in the resource-rich countries (by the example of Azerbaijan, Kazakhstan, and Russia). 55th International Scientific Conference on Economic and Social Development: Book of Proceedings, 18-19 June, 2020, pp. 736–744.

Hamidova, L. (2021): Impact of natural resource endowment on the economic development of Azerbaijan. 70th International Scientific Conference on Economic and Social Development: Book of Proceedings, Baku, Azerbaijan, 15-16 June, 2021, pp. 178–185.

Hanushek, E. A. – Wößmann, L. (2007): The role of education quality for economic growth. *World Bank Policy Research Working Paper*, No. 4122.

Haraguchi, N. – Cheng, C. F. C. – Smeets, E. (2017): The importance of manufacturing in economic development: Has this changed? *World Development*, 93, pp. 293–315.

Haraguchi, N. – Martorano, B. – Sanfilippo, M. (2019): What factors drive successful industrialization? Evidence and implications for developing countries. *Structural Change and Economic Dynamics*, 49, pp. 266–276.

Hartwig, J. (2010): Is health capital formation good for long-term economic growth? Panel Granger-causality evidence for OECD countries. *Journal of Macroeconomics*, 32(1), pp. 314–325.

Harvey, D. I. – Kellard, N. M. – Madsen, J. B. – Wohar, M. E. (2010): The Prebisch-Singer hypothesis: Four centuries of evidence. *The review of Economics and Statistics*, 92(2), pp. 367–377.

Hasanov, F. – Mikayilov, J. – Bulut, C. – Suleymanov, E. – Aliyev, F. (2017): The role of oil prices in exchange rate movements: The CIS oil exporters. *Economies*, *5*(2), 13.

Hasanov, F. (2010): The impact of real effective exchange rate on the non-oil export: The case of Azerbaijan. *MPRA Paper*, No. 29556, University Library of Munich, Germany.

Hasanov, F. (2013): Dutch disease and the Azerbaijan economy. *Communist and Post-Communist Studies*, 46(4), pp. 463–480.

Hasanov, M. (2020): Reforms and improvements in the oil industry of Azerbaijan. In (Ed.) Reznikova, O. S., Современные технологии управления персоналом, Сборник трудов VII Международной научно-практической конференции [Modern technologies of personnel management, Proceedings of the VII International Scientific and Practical Conference], pp. 111–119.

Hasanov, R. (2001): Гасанов, Р. (2001): Азербайджан: трансформация и перспективы развития экономики [Azerbaijan: transformation and prospects for economic development]. Центральная Азия и Кавказ [Central Asia and Caucasus], (5), 198.

Hasanov, R. (2017): International Bank of Azerbaijan: Why the South Caucasus's largest bank has requested restructuring? Available at: https://think-asia.org/bitstream/handle/11540/7423/CESD_Research_Paper_International_Bank_Azerbaijan.pdf?sequence=1 Accessed: 20 November 2021.

Hausmann R. – Hwang J. – Rodrik D. (2007): What you export matters. *Journal of Economic Growth*, 12(1), pp. 1–25.

Havro, G. – Santiso, J. (2017): To benefit from plenty: Lessons from Chile and Norway, *Policy Brief*, No. 37, OECD Development Centre.

Hayat, A. – Ganiev, B. – Tang, X. (2013): Expectations of future income and real exchange rate movements. *Journal of Banking & Finance*, 37(4), pp. 1274–1285.

Heaton, C. A. (1993): *The chemical industry*. Springer Science & Business Media, Oxford.

Heinrich, A. (2010): The formal political system in Azerbaijan and Kazakhstan: A background study. No. 107, Arbeitspapiere und Materialien – Forschungsstelle Osteuropa, Bremen.

Heller, T. C. (2006): African transitions and the resource curse: An alternative perspective. *Economic Affairs*, 26(4), pp. 24–33.

Henstridge, M. – Roe, A. (2020): The macroeconomic management of natural resources. In (Eds.) Addison, T. – Roe, A., *The Management of Resources as a Driver of Sustainable Development*, Oxford University Press, ISBN-13: 9780198817369

Herb, Michael. (2005): No representation without taxation? Rents, development, and democracy. *Comparative Politics* 37, pp. 297–317.

Hewitt, T. – Johnson, H. – Wield, D. (1992): *Industrialization and development*. Oxford University Press, Oxford.

Hidalgo, C. A. – Klinger, B. – Barabási, A. L. – Hausmann, R. (2007): The product space conditions the development of nations. *Science*, 317(5837), pp. 482–487.

Hoffman, D. I. (1999): Oil and development in post-Soviet Azerbaijan. *NBR Analysis*, No. 10, pp. 5–28.

Hoffman, D. I. (2000): *Oil and state-building in post-Soviet Azerbaijan and Kazakhstan*. University of California, Berkeley.

Hohmann, S. – Lefèvre, C. (2014): Post-Soviet transformations of health systems in the South Caucasus. *Central Asian Affairs*, 1(1), pp. 48–70.

Hoyos, S. C. (2019): Extractive industry revenues and the subnational resource curse: The case of the Peruvian Andes. *The Extractive Industries and Society*, 6(4), pp. 1134–1142.

Huang, T. L. – Orazem, P. F. – Wohlgemuth, D. (2002): Rural population growth, 1950–1990: The roles of human capital, industry structure, and government policy. *American Journal of Agricultural Economics*, 84(3), pp. 615–627.

Hübner, G. (2011): Foreign direct investment in Azerbaijan: The quality of quantity. *Caucasus Analytical Digest*, 28, pp.2–6.

Humphreys, M. – Sachs, J. D. – Stiglitz, J. E. (2007): Introduction: What is the problem with natural resource wealth. In (Eds.) Humphreys, M. – Sachs, J. D. – Stiglitz, J. E., *Escaping the Resource Curse*, pp. 1–20.

Hwang, Y. S. – Kim, S. E. – Choi, Y. J. (2010): Is BTC oil pipeline good or bad for Azerbaijan economy? *Environmental and Resource Economics Review*, 19(2), pp. 413–440.

Ibadoghlu, G. (2021): Retrospective and perspective view of the next stage of privatization in Azerbaijan. Economic Research Center (REC). Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3820963 Accessed: 22 January 2022.

Ibadoglu, G. (2008): Current state of Azerbaijan's economy: Myths and realities. *Transition Studies Review*, 15(2), pp. 425–430.

Ibrahimli, F – Aziz, O (2011): Sənayeləşmə və kollektivləşmə [Industrialization and collectivization]. Available at: https://kayzen.az/blog/Az%C9%99rbaycan-tarixi/5545/s%C9%99nayel%C9%99%C5%9Fm%C9%99-v%C9%99-kollektivl%C9%99%C5%9Fm%C9%99.html Accessed: 15.03.2022.

Ibrahimov, F. – Ibrahimova, A. – Kehler, J. – Richardson, E. (2010): Azerbaijan: Health system review. *World Health Organization*, Regional Office for Europe.

Ibrahimov, F. – Ibrahimova, A. – Richardson, E. (2010): Health financing in Azerbaijan. *Eurohealth*, 16(2), pp. 25–26.

Ibrahimova, S. (2017): Торговля Азербайджана продовольственными товарами и регулирование этой отрасли [Azerbaijan trade in food products and regulation of this industry]. *Russian Journal of Agricultural and Socio-Economic Sciences*, 66(6), 71–81.

Îlhan, E. (2007): Resource curse or resource blessing? Effective management of resource wealth in democratizing countries. *TURK. POL'Y Q.*, 6, 137. Available at: http://turkishpolicy.com/images/stories/2007-03-caucasus/TPQ2007-3-ilhan.pdf Accessed: 27 September 2021.

Im, Soo. J. – Jalali, R. – Saghir, J. (1993): *Privatization in the republics of the former Soviet Union: Framework and initial results*. PSD Group, Legal Department PSD and Privatization Group, CFS, Joint Staff Discussion Paper No. 12049. Available at: https://documents1.worldbank.org/curated/en/594271468265760890/pdf/multi0page.pdf Accessed: 01 October 2021.

IMF – International Monetary Fund. (1995): Azerbaijan: Recent economic developments. *IMF Staff Country Reports*, 1995(119). doi: https://doi.org/10.5089/9781451802504.002

IMF – International Monetary Fund. (1997): Azerbaijan: Recent economic developments. *IMF Staff Country Reports*, 1997(001). doi: https://doi.org/10.5089/9781451802511.002

IMF – International Monetary Fund. (1998): Azerbaijan: Recent economic developments. *IMF Staff Country Reports*, 1998(083). doi: https://doi.org/10.5089/9781451802528.002

IMF – International Monetary Fund. (2005a): Republic of Azerbaijan: Ex post assessment of longer-term program engagement. *Staff Report and Public Information Notice on the Executive Board Discussion*, 2005(259). doi: https://doi.org/10.5089/9781451802696.002

IMF – International Monetary Fund. (2005b): Republic of Azerbaijan: Fifth review under the poverty reduction and growth facility arrangement and request for waiver of performance criteria, 2005(260). doi: https://doi.org/10.5089/9781451931099.002

IMF – International Monetary Fund. (2010): Republic of Azerbaijan staff report for the 2010 Article IV Consultation, 2010(113). doi: https://doi.org/10.5089/9781455204205.002

IMF – International Monetary Fund. (2012): Republic of Azerbaijan: Selected issues, 2012 (006). doi: https://doi.org/10.5089/9781463931889.002

Innis, H. (1956): *Essays in Canadian economic history*. University of Toronto Press, Toronto.

Inuwa, N. – Adamu, S. – Sani, M. B. – Saidu, A. M. (2022b): Resource Curse Hypothesis in GCC Member Countries: Evidence from Seemingly Unrelated Regression. *Biophysical Economics and Sustainability*, 7(4), 1–10.

Inuwa, N. – Sani, M. B. – Adamu, S. – Modibbo, H. U. – Saidu, A. M. (2022a): Testing the Resource Curse Hypothesis: Evidence from Top Ten Resource-Rich Countries in Africa. *African Journal of Business & Economic Research*, 17(2).

Investopedia (2021): Broad money. Available at: https://www.investopedia.com/terms/b/broad-money.asp Accessed: 15 November 2021.

Ismayil, Z. (2015): Oil dependence and challenges of the economic diversification. *Atlas Network.* Available at: http://freeeconomy.az/site/assets/files/1393/economic_diversification_challenge.pdf Accessed: 01 May 2021.

Iversen, T. – Cusack, T. R. (2000): The causes of welfare state expansion: Deindustrialization or globalization? *World Politics*, 52(3), pp. 313–349.

Ivinson, A. J. (2002): Macroeconomics and health: investing in health for economic development. *Nature Medicine*, 8(6), pp. 551-552.

Jaba, E. – Ionescu, A. M. – Iatu, C. – Balan, C. B. (2009): The evaluation of the regional profile of the economic development in Romania. *Analele Stiintifice ale Universitatii "Alexandru Ioan Cuza" din Iasi - Stiinte Economice*, 56(1), pp. 537–549.

Johnston, B. F. (1970): Agriculture and structural transformation in developing countries: A survey of research. *Journal of Economic Literature*, 8(2), pp. 369–404.

Jolliffe, I. (1990): Principal component analysis: A beginner's guide - I. Introduction andapplication. Weather, 45, pp. 375–382.

Jonnard, A. – Michels, D. – Raftery, J. P. (1985): Chemical industry growth in developing countries and changing US trade patterns. Washington, DC, 20436.

Jorgenson, D. W. – Khuong, V. (2003): Information technology and the G7 economies. *Rivista Di Politica Economica*, 107(4), pp. 631–650.

Kadiyala, K. R. – Karlsson, S. (1997): Numerical methods for estimation and inference in Bayesian VAR-models. *Journal of Applied Econometrics*, 12(2), pp. 99–132.

Kaiser, H. F. (1974): An index of factorial simplicity. *Psychometrika*, 39(1), pp. 31–36.

Kaldor, N. (1957): A model of economic growth. *The Economic Journal*, 67(268), pp. 591–624.

Kaldor, N. (1960): *Causes of growth and stagnation in the world economy*. Cambridge University Press, Cambridge.

Kaldor, N. (1966): *Causes of the slow rate of economic growth of the United Kingdom: An inaugural lecture*. Cambridge University Press, Cambridge.

Kalyuzhnova, Y. – Kaser, M. (2005): Prudential management of hydrocarbon revenues in resource-rich economies. United Nations Economic Commission for Europe, *Discussion Paper Series*, No. 2005.4

Kamrava, M. (2001): State-building in Azerbaijan: the search for consolidation. *The Middle East Journal*, 55(2), pp. 216–236.

Kandžija, V. – Tomljanović, M. – Huđek, I. (2017): Deindustrialization as a process in the EU. *Ekonomski vjesnik: Review of Contemporary Entrepreneurship, Business, and Economic Issues*, 30(2), pp. 399–414.

Kang, S. J. – Lee, H. (2011): Foreign Direct Investment and Deindustrialisation. *The World Economy*, 34(2), pp. 313–329.

Kansheba, J. M. P. – Marobhe, M. I. (2022): Institutional quality and resource-based economic sustainability: the mediation effects of resource governance. *SN business & economics*, 2(2), 1–24.

Karl, T. L. (2007): Oil-led development: Social, political, and economic consequences. *Encyclopedia of energy*, 4(8), 661–672.

Kaser, M. (2003): The economic and social impact of systemic transition in Central Asia and Azerbaijan. *Perspectives on Global development and Technology*, 2(3), pp. 459–473.

Katchanovski, I. (2000): Divergence in growth in post-communist countries. *Journal of Public Policy*, pp. 55–81.

Kaynak, E. – Nasirova, Z. (2005): The transition period of C.I.S. economies. *Journal of East-West Business*, 10(3), pp. 31–51.

Kefela, G. T. (2010): Knowledge-based economy and society has become a vital commodity to countries. *International NGO Journal*, 5(7), 160–166.

Keijer, T. – Bakker, V. – Slootweg, J. C. (2019): Circular chemistry to enable a circular economy. *Nature chemistry*, 11(3), pp. 190–195.

Kelesbayev, D. – Myrzabekkyzy, K. – Bolganbayev, A. – Baimaganbetov, S. (2022): The effects of the oil price shock on inflation: the case of Kazakhstan. *International Journal of Energy Economics and Policy*, 12(3), 477–481.

Kendall-Taylor, A. (2012): Purchasing power: Oil, elections and regime durability in Azerbaijan and Kazakhstan. *Europe-Asia Studies*, 64(4), pp. 737–760.

Kerimli, F. X. – Mursalzada, Z. M. – Isa-Zadah, Sh. C. (2021): Klasterlərin inkişaf etdirilməsi - neft-kimya sənayesində sahibkarlığın inkişafında əhəmiyyətli perspektiv kimi [Development of clusters - as an important perspective for the development of entrepreneurship in the petrochemical industry]. *Azərbaycan Neft Təsərrüfatı Jurnalı [Azerbaijan Oil Industry Journal]*, 2, pp. 44–53. Avaiable at:

http://www.anl.az/down/meqale/az_neft_teser/2021/02/769933(meqale).pdf Accessed: 31.01.2022.

Khalilzada, J. (2019): Modernization and social change in Azerbaijan: Assessing the transformation of Azerbaijan through the theories of modernity. *New Middle Eastern Studies*, 9(2), pp.168–188.

Khan, A. – Turowski, K. (2016): A survey of current challenges in manufacturing industry and preparation for industry 4.0. In Proceedings of the First International Scientific Conference “Intelligent Information Technologies for Industry” (IITI’16) (pp. 15–26). Springer, Cham.

Khanna, P. (2011): Azerbaijan: The cork in the Caspian bottle. *Russia and the moslem world*, 7, 229.

Khyareh, M. M.–Rostami, N. (2022): Macroeconomic conditions, innovation and competitiveness. *Journal of the Knowledge Economy*, 13(2), pp. 1321–1340.

Kiely, R. (2005). *Industrialization & development*. Routledge, London.

Kim, C. S.– Lee, S. (2018): Regime types, ideological leanings, and the natural resource curse. *Constitutional Political Economy*, 29(1), 1–19.

Kindleberger, C. P. (1956): The Terms of Trade: A European Case Study, Wiley, 274–308.

Kindleberger, C. P. (1958): The terms of trade and economic development. *The Review of Economics and Statistics*, 72–85.

Kocharli, A. (2011). Оценка состояния внешнеторговых отношений Азербайджана [Assessment of the state of Azerbaijan's foreign trade relations]. *Перспективы Науки*, 12(27), 219–222.

Koeda, J. – Kramarenko, V. (2008): Impact of government expenditure on growth: The case of Azerbaijan. IMF Working Paper No. 8–115, 1–18.

Koh, W. C. (2017): Fiscal policy in oil-exporting countries: The roles of oil funds and institutional quality. *Review of Development Economics*, 21(3), 567–590.

Kojo, N. C. (2014): *Demystifying Dutch disease*. The World Bank.

Kollmeyer, C. (2009): Explaining deindustrialization: How affluence, productivity growth, and globalization diminish manufacturing employment. *American Journal of Sociology*, 114(6), 1644–1674.

Kolstad, I. – Søreide, T. – Williams, A. (2008): Corruption in natural resource management-An introduction. *U4 Brief*, *2008*(2).

Kolstad, I. (2009): The resource curse: Which institutions matter? *Applied Economics Letters*, 16(4), 439–442.

Koop, G. – Korobilis, D. (2010): Bayesian multivariate time series methods for empirical macroeconomics. *Foundations and Trends® in Econometrics*, 3(4), 267–358.

Koop, G. – Potter, S. (2003): Forecasting in large macroeconomic panels using Bayesian Model Averaging.

Kopsidis, M. – Ivanov, M. (2017): Industrialization and de-industrialization in Southeast Europe, 1870–2010. *The spread of modern industry to the periphery since 1871*, 91–114.

Koritz, D. (1991): Restructuring or destructuring? Deindustrialization in two industrial heartland cities. *Urban Affairs Quarterly*, 26(4), 497–511.

Kragh, H. (2017): Sulphuric acid was the bedrock of the Industrial Revolution. *Science Nordic*, Available at: https://sciencenordic.com/chemistry-denmark-researcher-zone/sulphuric-acid-was-the-bedrock-of-the-industrial-revolution/1450988 Accessed: 08.02.2022.

Krajnyák, K. – Zettelmeyer, J. (1998): Competitiveness in transition economies: What scope for real appreciation? *Staff Papers*, 45(2), pp. 309–362.

Krueger, A. (1974): The political economy of the rent-seeking society. *The American Economic Review*, 64, pp. 291–303.

Krueger, A. (1980): Trade policy as an input to development. *American Economic Review*, 70(2), pp. 288–292.

Krueger, J. S. – Lewis-Beck, M. S. (2008): Is OLS dead? *The Political Methodologist*, 15(2), pp. 2–4.

Kruse, H. – Mensah, E. – Sen, K. – de Vries, G. (2021): A manufacturing renaissance? Industrialization trends in the developing world. *WIDER Working Paper*, No. 2021/28.

Kruse, H. – Mensah, E. – Sen, K. – de Vries, G. (2021): *A manufacturing renaissance? Industrialization trends in the developing world* (28th ed., Vol. 2021). UNU-WIDER.

Kurečić, M. – Seba, P. (2016): The resource curse in sub-saharan Africa: A reality corroborated by the empirical evidence. Available at: https://www.bib.irb.hr/820620/download/820620.The_Resource_Curse_in_SubSaharan_Africa.pdf Accessed: 26 November 2022.

Kuriakose, S. (2013): *Fostering entrepreneurship in Azerbaijan*. The World Bank Group, Washington DC, the USA.

Kuznets, S. (1957): Quantitative aspects of the economic growth of nations: II. industrial distribution of national product and labor force. *Economic Development and Cultural Change*, 5(S4), pp. 1–111.

Kwak, S. K. – Kim, J. H. (2017): Statistical data preparation: Management of missing values and outliers. *Korean Journal of Anesthesiology*, 70(4), pp. 407–411.

Lane, P. – A. Tornell, (1997): Voracity and growth. *Harvard Institute for Economic Research Discussion Paper*, No. 1807.

Lashitew, A. A. – Ross, M. L. – Werker, E. (2021): What drives successful economic diversification in resource-rich countries?. *The World Bank Research Observer*, 36(2), 164–196.

Laurens, P. (2002): Azerbaijan taking tentative steps toward diversifying economy. *Central Asia-Caucasus Institute*. Available at: https://www.cacianalyst.org/publications/analytical-articles/item/7005-analytical-articles-caci-analyst-2002-10-23-art-7005.html Accessed 11 July 2021.

Laurila, J. – Singh, R. (2001): Sequential reform strategy: The case of Azerbaijan. *Russian & East European Finance and Trade*, 37(3), pp. 25–76.

Lebdioui, A. (2020): Economic diversification, oil revenue management, and industrial policy in the Middle East and North Africa. *Working paper*, No. 1416, Economic Research Forum (ERF).

Lee, C. C. – He, Z. W. (2022): Natural resources and green economic growth: An analysis based on heterogeneous growth paths. Resources Policy, 79, 103006.

Lee, C. M. (2005): Black gold or the devil's curse? Oil and networks in azerbaijan. *Journal of the Korean Association of Regional Geographers*, 11(6), pp. 640–656.

Leite, M. C. – Weidmann, J. (1999): Does mother nature corrupt: Natural resources, corruption, and economic growth. *Working paper*, International Monetary Fund.

Lesch, J. (2000): Introduction. In Lesch, J. (Ed.), *The German chemical industry in the twentieth century*, 18. Kluwer Academic Publishers, Springer Science & Business Media, Dordrecht.

Lewis, A. (1954): Economic development with unlimited supplies of labour. *Manchester School of Economics and Social Studies*, 22(2), pp. 139–91.

Lieberman, I. W. – Ewing, A. – Mejstrik, M. – Mukherjee, J. – Fidler, P. (1995): Mass privatization in Central and Eastem Europe and the Former Soviet Union. *The World Bank*, Washington DC.

Lieberman, I. W. (1993): Privatization: The theme of the 1990s. *The Columbia Journal of World Business*, 28(1), pp. 8–17.

Linneberg, M. S. – Korsgaard, S. (2019): Coding qualitative data: A synthesis guiding the novice. *Qualitative Research Journal*, 19(3), pp. 259–270.

Livingston, E. – Cao, J. – Dimick, J. B. (2010): Tread carefully with stepwise regression. *Archives of Surgery*, 145(11), pp. 1039–1040.

Lorentzen, J. (2008): *Resource intensity, knowledge and development: Insights from Africa and South America*. HSRC Press, Cape Town.

Lowe, P. (2012): The changing structure of the Australian economy and monetary policy. *RBA Bulletin, March*, pp. 79–84.

Lucas, R. (1988): On the mechanics of economic development. *Journal of Monetary Economics*, 22(1), pp. 3–42.

Luong, P. J. – Weinthal, E. (2001): Prelude to the resource curse: Explaining oil and gas development strategies in the Soviet successor states and beyond. *Comparative Political Studies*, 34(4), pp. 367–399.

Luong, P. J. – Weinthal, E. (2006): Rethinking the resource curse: Ownership structure, institutional capacity, and domestic constraints. *Annual Review of Political Science*, 9, pp. 241–263.

Maachi, M. – Benloulou, S. B. (2022): Dutch Disease and Exchange Rate in Algeria: An Empirical Investigation.

Magud, N. – Sosa S. (2013): When and why worry about real exchange rate appreciation? The missing link between Dutch disease and growth. *Journal of International Commerce, Economics and Policy*, 4(2), 1350009.

Mahnovski, S. (2003): *Natural resources and potential conflict in the Caspian Sea region*, Caucasus: Implications for the U.S. Army, RAND, in Olga Oliker, Thomas Szayna, (eds.), Faultlines of Conflict in Central Asia and the South, Santa Monica, pp. 109–143.

Majidli, F. – Guliyev, H. (2020): How oil price and exchange rate affect non-oil GDP of the oil-rich Country–Azerbaijan? *International Journal of Energy Economics and Policy*, 10(5), pp.123–130.

Majidli, F. (2022): The effects of oil prices and oil production on non-oil exports in an oil-rich country: The case of Dutch Disease symptom in Azerbaijan. *International Journal of Energy Economics and Policy*, 12(3), pp. 32–40.

Majumder, M. K. – Raghavan, M. – Vespignani, J. (2020): Oil curse, economic growth and trade openness. *Energy Economics*, 91, 104896.

Malich, G. – Braun, M. – Loullis, P. – Winder, C. (1998): Comparison of regulations concerning hazardous substances from an international perspective. *Journal of Hazardeous Materials*, 62(2), pp. 143–159.

Malik, P. (2010): The resource curse in Post-Soviet countries: The case of Azerbaijan, Doctoral dissertation, Khazar University, Baku, Azerbaijan.

Maloney, W. F. – Nayyar, G. (2018): Industrial policy, information, and government capacity. *The World Bank Research Observer*, 33(2), 189–217.

Mammadov, J. (2016): *Oil price shocks and monetary policy in Azerbaijan: Challenges and opportunities*. Available at: http://dspace.khazar.org/handle/20.500.12323/3413 Accessed: 01 August 2021.

Mammadova, G. – Coskun, A. (2015): Costs and benefits of foreign direct investment to Azerbaijan's economy: The case of oil sector. *Asian Journal of Finance and Accounting*, 7(1), pp. 135-154.

Manca, A. R. (2014): Social cohesion. *Encyclopedia of quality of life and well-being research. Dordrecht: Springer Netherlands*, 6026-8.

Mankiw, N. G. – D. Romer –D. N. Weil (1992): A Contribution to the empirics of economic growth. *Quarterly Journal of Economics*, 107, pp. 407–437.

Mankiw, N. G. (1997): Comment. In (Eds.) Bernanke, B. – Rotemberg, J., *NBER Macroeconomics Annual*, MIT Press, Cambridge, MA, pp. 103–106

Mapon, M. P. – Tsasa, J. P. K. (2019): The artefact of the Natural Resources Curse. Available at: https://arxiv.org/abs/1911.09681 Accessed: 28 October 2021.

Masih, R. – Masih, A. M. M. (1996): Stock-Watson dynamic OLS (DOLS) and error correction modeling approaches to estimating long-and short-run elasticities in a demand function: New evidence and methodological implications from an application to the demand for coal in mainland China. *Energy Economics*, 18(4), pp. 315–334.

Matsuyama, K. (1992): Agricultural productivity, comparative advantage, and economic growth. *Journal of Economic Theory*, 58(2), pp. 317–334.

Mavrotas, G. – Murshed, S. M. – Torres, S. (2011): Natural resource dependence and economic performance in the 1970–2000 period. *Review of Development Economics*, 15(1), pp. 124–138.

Mayer, J. (2018): Robots and industrialization: What policies for inclusive growth? *Working Paper*, Group of 24 and Friedrich-Ebert-Stiftung New York.

McMillan, M. – Rodrik, D. – Verduzco-Gallo, Í. (2014): Globalization, structural change, and productivity growth, with an update on Africa. *World Development*, 63, pp. 11–32.

McMillan, M. S. – Rodrik, D. (2011): Globalization, structural change and productivity growth. *Working Paper*, No. 17143, National Bureau of Economic Research.

Mehdiyev, M. (2020): Azerbaijan expands one-stop-shop public services network. Caspian News, Available at: https://caspiannews.com/news-detail/azerbaijan-expands-one-stop-shop-public-services-network-2020-2-4-56/ Accessed: 20 October 2021.

Mehmet, K. (2006): State-building vs. resource management (the case of Azerbaijan and its oil fund management). *Central Asia and the Caucasus*, 1(37), pp. 125–134.

Mehmood, B. – Shahid, A. (2014): Aviation demand and economic growth in the Czech Republic: Cointegration estimation and causality analysis. *Statistika*, 94(1), pp. 54–63.

Mehrara, M. (2009): Reconsidering the resource curse in oil-exporting countries. *Energy Policy*, 37(3), pp. 1165–1169.

Mehtiyev A. (2018): Foreign direct investment in Azerbaijan's Economy: Current status, development trends and challenges. Baku Research Institute. Available at: https://bakuresearchinstitute.org/foreigndirect-investment-in-azerbaijans-economy-current-status-development-trends-and-challenges/ Accessed: 03 May 2020.

Mehtiyev, A. (2017): İnvestisiyaların stimullaşdırılması siyasəti: onu necə gücləndirmək olar? [Investment Promotion Policy: How to Improve It?], In (Ed.) Baghirov, S., İslahat Təklifləri Toplusu, siyasət yazıları [Collection of Reform Recommendations, policy papers], pp. 39–87. Available at: http://edf.az/uploads/documents/islahat_takliflar_toplusu.pdf Accessed: 20 November 2021.

Meltzer, Allan H. – Richard, F. S. (1981): "A Rational theory of the size of government," *Journal of Political Economy*, 89, pp. 914–927.

Merriem-Webster (2021): Industry. Available at: https://www.merriam-webster.com/dictionary/industry Accessed: 01 March 2022.

Mesagan, P. E. – Unar, A. – Idowu, J. – Alamu, A. (2019): Oil resource abundance in Nigeria and Iran: contrapuntal effect on social and economic welfare. *BizEcons Quarterly*, 4, pp. 3–22.

Mikayilov, F. – Najafov, S. (2019): Impact of interest rates on manufacturing's share of GDP. In Proceedings of 37th International Scientific Conference on Economic and Social Development – "Socio Economic Problems of Sustainable Development" - Baku, Azerbaijan, 14-15 February 2019, pp. 212–218.

Mikesell, R. F. (1997): Explaining the resource curse, with special reference to mineral-exporting countries. *Resources Policy*, 23(4), pp. 191–199.

Mills, M. – van de Bunt, G. G. – de Bruijn, J. (2006): Comparative Research: Persistent Problems and Promising Solutions. *International Sociology*, 21(5), pp. 619–631. https://doi.org/10.1177/0268580906067833

Mironov, V. V. – Petronevich, A. V. (2015): Discovering the signs of Dutch disease in Russia. *Resources Policy*, 46, pp. 97–11.

Misala, J. (1992): Openness and competitiveness of economies of the East European countries and the former Soviet Union. *Kiel Working Paper*, No. 501.

Mlambo, C. (2022): Politics and the natural resource curse: Evidence from selected African states. *Cogent Social Sciences*, 8(1), 2035911.

Mohan, S. V. – Katakojwala, R. (2021): The circular chemistry conceptual framework: A way forward to sustainability in industry 4.0. *Current Opinion in Green and Sustainable Chemistry*, 28, 100434.

Moholwa, M. (2017): The impact of re-industrialization on economic growth and employment in South Africa. Doctoral dissertation, Available at: https://repository.up.ac.za/bitstream/handle/2263/64885/Moholwa_Impact_2018.pdf?sequence=3&isAllowed=y (Accession No. 02606356). Accessed: 13 February 2019.

Möller, D. P. (2016): Digital manufacturing/industry 4.0. In *Guide to Computing Fundamentals in Cyber-Physical Systems*, Springer, Cham, pp. 307–375.

Montrone, L. – Ohlendorf, N. – Chandra, R. (2021): The political economy of coal in India–Evidence from expert interviews. *Energy for Sustainable Development*, 61, pp. 230–240.

Mukhtarov, E. (2018): *The economy of Azerbaijan in 2017 - Brief Overview*. Available at: https://think-asia.org/handle/11540/12671 Accessed: 13 May 2019.

Mukhtarov, S. – Humbatova, S. – Mammadli, M. – Hajiyev, N. G. O. (2021): The impact of oil price shocks on national income: Evidence from Azerbaijan. *Energies*, 14(6), 1695.

Mukhtarov, S. – Mammadov, I. – Humbatova, S. (2020): The relationship between government expenditures on education and economic growth: The Case of Azerbaijan. *Research in World Economy*, 11(1), pp. 195–201.

Muradov, A. (2021): The importance of natural resources for the Azerbaijani economy. *Economics Business and Organization Research*, 3(1), pp. 117–131.

Muradov, A. (2022): Energy sector’s monopoly rent-seeking and supplementary time-series analysis in the case of Azerbaijan. *Anadolu University Journal of Faculty of Economics*, 4(1), pp. 36–49.

Murshed, S. M. (2004): *When does natural resource abundance lead to a resource curse? Environmental Economics Programme Discussion Paper*, No. 04-01, International Institute for Environment and Development.

Mustafayev, S. (2016a): Sahibkarlığın inkişafı dinamik xarakter alır [The development of entrepreneurship is dynamic]. *Mövqe*, 130(3543), 10. Available at: http://www.anl.az/down/meqale/movqe/2016/iyul/500580.jpg Accessed: 03 November 2021.

Mustafayev, S. (2016b): Qeyri-neft sektoru üzrə vergi daxilolmaları artıb [Tax revenues for the non-oil sector have increased]. *Mövqe*, 169(3579), 10. Available at: http://www.anl.az/down/meqale/movqe/2016/sentyabr/506082.jpg Accessed: 03 November 2021.

Natkhov, T. – Polishchuk, L. (2019): Quality of Institutions and the Allocation of Talent: Cross-National Evidence. *Kyklos*, 72(4), 527–569.

Naudé, W. (2013): Why Indonesia needs a more innovative industrial policy. *ASEAN Journal of Economics, Management and Accounting*, 1(1), pp. 48–65.

Nazemzadeh, M. – Meersman, H. – Vanelslander, T. (2015): Transport contribution to the economic development, case study of Antwerp. In Paper presented in the World conference transport research society, the port and maritime sector: Key developments and challenges, WCTRS-Special interest group 2, 11-12 may 2015, unpublished.

Niftiyev, I. – Czech, K. (2020): Dutch disease perspective on vegetable exports in the Azerbaijan economy. *Journal of Applied Economic Sciences*, 70(4), pp. 813–827.

Niftiyev, I. (2018): De-industrialization patterns of Azerbaijan: potential outcomes of Dutch disease syndrome. *SSRN Electronic Journal*. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3748107 Accessed: 12 April 2020.

Niftiyev, I. (2020a): Dutch disease symptoms in Azerbaijan Economy. *Journal of Economic Cooperation and Development*, 41(3), pp. 33–66.

Niftiyev, I. (2020a): The De-industrialization process in Azerbaijan: Dutch disease syndrome revisited. In Proceedings of the 4th Central European PhD Workshop on Technological Change and Development (pp. 357-396). Szeged: Faculty of Economics and Business Administration, Doctoral School in Economics, University of Szeged.

Niftiyev, I. (2020b): Descriptive analysis of employment in Azerbaijan: Possibilities of the Dutch disease. *Journal of Economic Sciences: Theory & Practice*, 77(1), pp. 100–112.

Niftiyev, I. (2021): Dutch disease effects in the Azerbaijan economy: Results of multivariate linear ordinary least squares (OLS) estimations. *HSE Economic Journal*, 25(2), pp. 309–346.

Niftiyev, I. (2022): Textile and chemical subsectors in the Azerbaijani economy: A descriptive glance at possible de-industrialization. Working paper, No. 6. Available at: https://www.econstor.eu/handle/10419/250900

Noman, A. – Stiglitz, J. E. (2015): Introduction and overview: Economic transformation and learning, industrial, and technology policies in Africa. *Industrial policy and economic transformation in Africa. Columbia University Press, New York.*

Norman, C. S. (2009): Rule of law and the resource curse: Abundance versus intensity. *Environmental and Resource Economics*, 43(2), 183–207.

Nülle, G. M. – Davis, G. A. (2018): Neither Dutch nor disease? Natural resource booms in theory and empirics. *Mineral Economics*, 31(1-2), pp. 35–59.

O'Lear, S. (2001): Azerbaijan: Territorial issues and internal challenges in mid-2001. *Post-Soviet Geography and Economics*, 42(4), pp. 305–312.

O'lear, S. (2007): Azerbaijan's resource wealth: Political legitimacy and public opinion. *Geographical Journal*, 173(3), pp. 207–223.

OECD – Organisation for Economic Co-operation and Development (2011a): The economic significance of natural resources: Key points for reformers in Eastern Europe, Caucasus and Central Asia. Available at: http://www.oecd.org/env/outreach/2011_AB_Economic%20significance%20of%20NR%20in%20EECCA_ENG.pdf. Accessed 26.12.20

OECD – Organisation for Economic Co-operation and Development (2011b): Towards green growth: Monitoring progress OECD indicators. Available at: https://www.oecd.org/greengrowth/48224574.pdf Accessed 26.12.20.

Ogaki, M. – Ostry, J. D. – Reinhart, C. M. (1996): Saving behavior in low-and middle-income developing countries: A comparison. *Staff Papers*, 43(1), pp. 38–71.

Öge, K. (2014): The limits of transparency promotion in Azerbaijan: External remedies to 'reverse the curse'. *Europe-Asia Studies*, 66(9), pp. 1482–1500.

Okoye, L. U. – Omankhanlen, A. E. – Okoh, J. I. – Okorie, U. E. – Ezeji, F. N. – Ehikioya, B. I. – Ezu, G. K. (2021): Effect of energy utilization and financial development on economic growth in Nigeria. *International Journal of Energy Economics and Policy*, 11(2), 392.

Olamade, O. – Oni, O. (2016): Manufacturing and economic growth in Africa: A panel test of Kaldor's first growth law. J*ournal of Economics and Sustainable Development*, 7(22), pp. 126–140.

Olson, M. (2000): *Power and prosperity: Outgrowing communist and capitalist dictatorships*. Basic Books, New York.

Ossowski, R. – Villafuerte, M. – Medas, P. A. – Thomas, T. (2008): Managing the oil revenue boom: The role of fiscal institutions. *IMF Occasional Papers*, No. 2008/03, International Monetary Fund.

Ouliaris, S. – Pagan, A. – Restrepo, J. (2016): Quantitative macroeconomic modeling with structural vector autoregressions–an EViews implementation. *IHS Global*, 13.

Owusu, B. (2018): 'Doomed by the 'Resource Curse?' fish and oil conflicts in the Western Gulf of Guinea, Ghana. *Development*, 61(1-4), pp. 149–159.

Oyinlola, M. – Adeniyi, O. – Raheem, I. (2015): Natural resource abundance, institutions and economic growth in Africa. African Journal of Economic and

Sustainable Development, 4(1), 34–48. https://doi.org/10.1504/AJESD.2015.068513

Ozturk, S. – Altingoz, B. (2018): Imalat sektoru firma karliliginin ekonomik buyume uzerine etkisi: Turkiye icin bir uygulama [The effect of manufacturing sector firm profitability on economic growth: Evidence from Turkey]. *Omer Halisdemir Universitesi Iktisadi ve Idari Bilimler Fakultesi Dergisi*, 11(3), pp. 18–25.

Pahl, S. – Timmer, M. P. (2020): Do global value chains enhance economic upgrading? A long view. *The Journal of Development Studies*, 56(9), pp. 1683–1705.

Palma, J. G. (2008): De-industrialization, 'premature' de-industrialization and the Dutch disease. *Revista NECAT-Revista do Núcleo de Estudos de Economia Catarinense*, 35(5), pp. 7–23.

Pandian, R. K. (2017): Does manufacturing matter for economic growth in the era of globalization? *Social Forces*, 95(3), pp. 909–940.

Papyrakis, E. – Gerlagh, R. (2004): The resource curse hypothesis and its transmission channels. *Journal of Comparative Economics*, 32, pp. 181–193.

Park, J. Y. (1992): Canonical cointegrating regressions. *Econometrica*, 60(1), pp.119–143.

Pashayev, F. M. (2013): Investment policies and competitiveness of Azerbaijani economy. *Khazar Journal of Humanities and Social Sciences*, 16(2), pp. 22–31.

Pata, U. K. – Zengin, H. (2020): Testing Kaldor's growth laws for Turkey: New evidence from symmetric and asymmetric causality methods. *Çankırı Karatekin Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 10(2), pp. 713–729.

Paulus-Rohmer, D. – Schatton, H. – Bauernhansl, T. (2016): Ecosystems, strategy and business models in the age of digitization–How the manufacturing industry is going to change its logic. *Procedia CIRP*, 57, pp. 8–13.

Peneder, M. – Streicher, G. (2018): De-industrialization and comparative advantage in the global value chain. *Economic Systems Research*, 30(1), pp. 85–104.

Perez, C. – Claveria, O. (2020): Natural resources and human development: Evidence from mineral-dependent African countries using exploratory graphical analysis. *Resources Policy*, *65*, 101535.

Pessoa, A. (2008): Natural resources and institutions: The "natural resources curse" revisited. *MPRA Paper*, No. 8640.

Petrevski, G. – Exterkate, P. – Tevdovski, D. – Bogoev, J. (2015): The transmission of foreign shocks to South Eastern European economies: A Bayesian VAR approach. *Economic Systems*, 39(4), pp. 632–643.

Philips, P. – Moon, H. (1999): Linear regression limit theory for nonstationary panel data. *Econometrica*, 67(5), pp. 1057–1111.

Phillips, P. C. – Hansen, B. E. (1990): Statistical inference in instrumental variables regression with I (1) processes. *The Review of Economic Studies*, 57(1), pp. 99–125.

Phillips, P. C. – Loretan, M. (1991): Estimating long-run economic equilibria. *The Review of Economic Studies*, 58(3), pp. 407–436.

Pomfret, R. (2001): Reintegration of formerly centrally planned economies into the global trading system. *ASEAN Economic Bulletin*, 18(1), pp. 35–47.

Pomfret, R. (2011): Exploiting energy and mineral resources in Central Asia, Azerbaijan and Mongolia. *Comparative Economic Studies*, 53(1), pp. 5–33.

Popov, V. (2019): Successes and failures of industrial policy: Lessons from transition (post-communist) economies of Europe and Asia. *MPRA Paper*, No. 95332.

Prebisch, R. (1950): The economic development of Latin America and its principal problems. *UN Document*, No. E/CN.12/89/Rev.1. Lake Success: United Nations Department of Economic Affairs; reprinted in Raul Prebisch and Development Strategy (1987), New Delhi: Research and Information System for the Non-Aligned and Other

Prebisch, R. (1959): Commercial policy in the underdeveloped countries. *The American Economic Review*, 49(2), pp. 251–73.

Prebisch, R. (1964): Towards a new trade policy for development. United Nations, UNCTAD, New York.

Pritchett, L. (1996): "Where has all the education gone?" *Policy Research Working Paper*, No. 581, World Bank, Washington DC.

Pylin, A. G. (2015): Foreign economic relations of Azerbaijan in the context of regional integration. *Post-Soviet Issues*, 2(1), pp. 58–76.

Quatrostrategies (2022): Taiwan buys first carbon free crude from SOCAR. Available at: https://www.quatrostrategies.ca/taiwan-buys-first-carbon-free-crude-from-socar/ Accessed: 21 July 2022.

Radnitz, S. (2012): Oil in the family: Managing presidential succession in Azerbaijan. *Democratization*, 19(1), pp. 60–77.

Rahman, M. M. – Karim, A. A. M. E. – Ahmed, Z. – Hakan, A. C. E. T. (2021): Environmental Kuznets Curve for Bangladesh: Evidence from fully modified OLS Approach. *JOEEP: Journal of Emerging Economies and Policy*, 6(2), pp. 5–14.

Raifu, I. A. (2021): The institutional role in oil revenue-economic growth nexus in Nigeria. *OPEC Energy Review*, 45(1), pp. 52–84.

Rakov, I. (2020): Особенности финансовой либерализации стран "каспийской пятерки." [Features of the financial liberalization of the countries of the "Caspian five.]. *Экономические Отношения*, 10(4), pp. 1229–1250.

Rambaldi, A. N. – Hall, G. – Brown, R. P. (2006): *Re-testing the resource curse hypothesis using panel data and an improved measure of resource intensity* (No. 1004-2016-78490).

Ranis, G. – Stewart, F. – Ramirez, A. (2000): Economic growth and human development. *World development*, 28(2), pp. 197–219.

Rasiah, R. (2011): Is Malaysia facing negative deindustrialization? *Pacific Affairs*, 84(4), pp. 714–735.

Read, S. K. – Jibril, A. – Tongo, O. – Akindolire, A. – Abdulkadir, I. – Nabwera, H., ... – Network, T. N. N. (2020): Parents' perceptions of core outcomes in neonatal research in two Nigerian neonatal units. *BMJ paediatrics open*, 4(1).

Rey, S. (2006): Effective exchange rate volatility and MENA countries' exports to the EU. *Journal of Economic Development*, 31(2), 23–54.

Rickne, J. (2009): Oil prices and real exchange rate volatility in oil exporting economies: The role of governance. Research Inst. of Industrial Economics.

Ringnér, M. (2008): What is principal component analysis? *Nature Biotechnology*, 26(3), pp. 303–304.

Robinson, J. A – Torvik, R., (2005): White elephants. *Journal of Public Economics*, 89(2-3), pp. 197–210.

Rodriguez, F. – Sachs, J. D. (1999): Why do resource-abundant economies grow more slowly? *Journal of Economic growth*, 4(3), pp. 277–303.

Rodrik, D. (2007): *Industrial development: some stylized facts and policy directions. Industrial development for the 21st century*. UN, New York.

Rodrik, D. (2008): The real exchange rate and economic growth. *Brookings Papers on Economic Activity*, 2008(2), pp. 365–412.

Rodrik, D. (2009): Industrial policy: don’t ask why, ask how. *Middle East development journal*, 1(1), 1–29.

Rodrik, D. (2011): The future of economic convergence. *Working Paper*, No. w17400, National Bureau of Economic Research.

Rodrik, D. (2013): Unconditional convergence in manufacturing. *The Quarterly Journal of Economics*, 128(1), pp. 165–204.

Rodrik, D. (2016): Premature deindustrialization. *Journal of Economic Growth*, 21(1), pp. 1–33.

Roemer, M. (1979): Resource-based industrialization in the developing countries: A survey. *Journal of Development Economics*, 6(2), pp. 163–202.

Rojo-Labaien, E. (2020): *Oil-funded sports events as the embodiment of the evolution of post-Soviet Azerbaijan*. In Sport, Statehood and Transition in Europe (pp. 233–249). Routledge.

Romer, P. M. (1990): Endogenous technological change. *Journal of Political Economy,* 98(5), pp. 71–102.

Rookwood, J. (2022): From sport-for-development to sports mega-events: conflict, authoritarian modernisation and statecraft in Azerbaijan. Sport in Society, 25(4), 847–866.

Rosenberg, C. B. – Saavalainen, T. (1998): How to deal with Azerbaijan's oil boom? Policy strategies in a resource-rich transition economy. *Working Paper,* International Monetary Fund.

Rosenstein-Rodan, P. (1943): Problems of Industrialisation of Eastern and South-Eastern Europe. *Economic Journal*, 53(210), pp. 202–11.

Ross, M. (2013): *The oil curse: How petroleum wealth shapes the development of nations*. Princeton University Press, Princeton.

Ross, M. L. (1999): The political economy of the resource curse. *World Politics*, 51(2), pp. 297–322.

Rosser, A. (2006): The political economy of the resource curse: A literature survey. *IDS Working Papers*, No. 268.

Rostow, W. (1961): *The stages of economic growth: A non-communist manifesto*. Cambridge University Press, Cambridge.

Rowthorn, R. – Ramaswamy, R. (1997): Deindustrialization: Its causes and implications, 10. International Monetary Fund, Washington, DC.

Rowthorn, R. – Ramaswamy, R. (1999): Growth, trade, and deindustrialization. *IMF Staff papers*, 46(1), pp. 18-41.

Russell, W. – Morris, S. – Mammado, I. (2004): Azerbaijan conflict assesment: Azerbaijan at the crossroads. USAID/Azerbaijan and USAID Office of Conflict Management and Mitigation. Available at: https://pdf.usaid.gov/pdf_docs/PNADC965.pdf Accessed: 21 November 2021.

Rustamov, E. (2010): Economic modernization of Azerbaijan: Challenges and solutions. Ekon-inform. [Рустамов, Э. (2010). Экономическая модернизация Азербайджана: вызовы и решения. Экон-Информ.]

Rzayeva, S. (2013): Oil and health care in post-Soviet Azerbaijan. *European Journal of Sociology/Archives Européennes de Sociologie/Europäisches Archiv für Soziologie*, pp. 33–63.

Sabiroglu, I. – Bashirli, S. (2012): Input–output analysis in an oil-rich economy: The case of Azerbaijan. *Resources Policy*, 37(1), pp. 73–80.

Sachs, J. – H. Shatz (1994): Trade and jobs in US manufacturing. *Brookings Papers on Economic Activity*, 1994(1), pp. 1–84.

Sachs, J. – Larrain, F. (1993): *Macroeconomics in the global economy*. New Jersey, Prentice Hall.

Sachs, J. D. – Warner, A. M. (2001): The curse of natural resources. *European Economic Review*, 45(4-6), pp. 827–838.

Sachs, J. D. – Warner, A. (1999): Natural resource intensity and economic growth. In *Development policies in natural resource economies*, (Eds.) Mayer, J.–Chambers, B.–Farooq, A., pp. 13–38.

Sachs, J. D. – Warner, A. M. (1997): Natural-resource abundance and economic growth (Cambridge, MA: Center for International Development and Harvard Institute for International Development, Harvard University).

Sachs, J. D. – Warner, A. M. (1999): The big push, natural resource booms and growth. *Journal of Development Economics*, 59(1), pp. 43–76.

Sadik-Zada, E. R. – Loewenstein, W. – Hasanli, Y. (2019): Production linkages and dynamic fiscal employment effects of the extractive industries: input-output and nonlinear ARDL analyses of Azerbaijani economy. *Mineral Economics*, 34(1), pp. 3–18.

Saeger, S. (1997): Globalization and deindustrialization: Myth and reality in the OECD. *Review of World Economics*, 133(4), pp. 579–608.

Saldaña, J. (2015): *The coding manual for qualitative researchers*. Sage, Thousand Oaks, CA.

Sanili A, U. – Uste, A. N. (2022): Review of new political risks for the multinational energy corporations in the Caspian basin: A study for Azerbaijan. *Transnational Corporations Review*, pp. 1–10.

Şanlisoy, S. – Ekinci, R. (2019): Azerbaycan ekonomisinin Hollanda Hastalığı açısından değerlendirilmesi. *Yönetim ve Ekonomi: Celal Bayar Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 26(2), pp. 595–608.

Schnakenberg, K. E. – Fariss, C. J. (2014): Dynamic patterns of human rights practices. *Political Science Research and Methods*, 2(1), pp. 1–31.

Schroeder, G. (1996): Economic transformation in the post-Soviet republics. In (Ed.) Kaminski, B., *Economic Transition in Russia and the New States of Eurasia*, 8, pp. 11–41.

Schubert, S. R. (2006): Revisiting the oil curse: are oil rich nations really doomed to autocracy and inequality? *MPRA Paper*, No. 10109.

Schwab, K. (2015): The Fourth industrial revolution. What it means and how to respond. Foreign Affairs. Available at: https://www.foreignaffairs.com/articles/2015-12-12/fourth-industrial-revolution Accessed: 01 January 2022.

Serra, D. (2006): Empirical determinants of corruption: A sensitivity analysis. *Public Choice*, 126(1), pp. 225–256.

Seyidzada, D. (1998): Azərbaycan XX əsrin əvvəllərində: Müstəqilliyə aparan yollar [Azerbaijan in the early twentieth century: The roads to independence]. Available at: https://erevangala500.com/upload/pdf/1323545340.pdf Accessed: 02.02.2022.

Shabsigh, G. – Ilahi, N. (2007): Looking beyond the fiscal: Do oil funds bring macroeconomic stability? *IMF Working Papers*, pp. 1–18.

Shahbaz, M. – Destek, M. A. – Okumus, I. – Sinha, A. (2019): An empirical note on comparison between resource abundance and resource dependence in resource abundant countries. *Resources Policy*, 60, pp. 47–55.

Shahbazov, I. – Afandiyev, Z. (2020): Perception of white-collar criminality: An online exploratory survey among students in Azerbaijan. *Ceza Hukuku ve Kriminoloji Dergisi*, 8(2), pp. 203–225.

Shahin, V. B. – Jamila, G. M. – Fargana, G. M. – Hajiyev, N. (2021): The impact of oil prices on economic activity: The case of Azerbaijan. *Journal of Politics and Law*, 14(2), pp. 39–46.

Shaw, D. L. (2013): Good governance in the post-Soviet south: Testing theories of the resource curse in Azerbaijan. *Journal of Politics & International Studies*, 9(2013), pp. 520–561.

Simachev, Y. – Yakovlev, A. – Bessonov, V. A. – Mironov, V. V. – Daniltsev, A. V. – Glazatova, M. K. – Rozmirovich, S. D. (2018): Industrial policy in Russia: How to open a new window of opportunity. National Research University–Higher School of Economics. XIX April Conference Paper presented at the International Scientific Conference of NRU HSE on economic and social development, Moscow.

Singer, H. W. (1950): The distribution of gains between investing and borrowing countries. *The American Economic Review*, 40(2), pp. 473–85.

Singer, H. W. (1975): The distribution of gains from trade and investment-revisited. *Journal of Development Studies*, 11(4), pp. 376–82.

Singer, Hans W. (1950): The distribution of gains between investing and borrowing countries. *American Economic Review, Papers and Proceedings*, 11(1950), pp. 473–485.

Singh R. – Laurila J. (1999): Azerbaijan: recent economic developments and policy issues in sustainability of growth. Bank of Finland Institute for Economies in Transition, *Discussion Papers*, No. 5.

Singh, A. (1977): UK industry and the world economy: A case of de-industrialisation? *Cambridge Journal of Economics*, 1(2), pp. 113–136.

Socarpolymer.az. About us. Available at: https://www.socarpolymer.az/en/about/ Accessed: 03 February 2022.

Sood, A. – Kohli, H. (1985): Industrial restructuring in developing countries: The need and the means. *Finance & Development*, 22(004). ISBN: 9781616353636.

Sovacool, B. K. – Andrews, N. (2015): Does transparency matter? Evaluating the governance impacts of the Extractive Industries Transparency Initiative (EITI) in Azerbaijan and Liberia. *Resources Policy*, 45, pp. 183–192.

Soyak, A. – Nesirova, Z. (2003): *Küreselleşme sürecinde IMF politikalarinin sonuçları: Azerbaycan deneyimi* [Consequences of IMF policies in the globalization process: Azerbaijan experience]. *MPRA Paper*, No. 2909.

Starr, S. F. – Stauffer, T. R. – Nanay, J. (1998): Symposium - caspian oil: pipelines and politics. *Middle East Policy*, 5(4), pp. 27–50.

Stevens, P. – Dietsche, E. (2008): Resource curse: An analysis of causes, experiences and possible ways forward. *Energy Policy*, 36(1), pp. 56–65.

Stevens, P. – Lahn G. – Korooshy J. (2015): The resource curse revisited. *EER Report*. Chatham House, London.

Stock, J. – Watson, M. (2006): Forecasting with many predictors. Handbook of Economic Forecasting, vol. 1, pp. 515–554 (Chapter 10).

Stock, J. H. – Watson, M. W. (1993): A simple estimator of cointegrating vectors in higher order integrated systems. *Econometrica*, 61(4), pp. 783–820.

Stock, J. H. – Watson, M. W. (2005): An empirical comparison of methods for forecasting using many predictors. (Manuscript) - Princeton University

Strategic Road Map for the National Economic Prospects of the Republic of Azerbaijan (2016): Available at: https://static.president.az/pdf/38542.pdf Accessed 09 March 2022.

Su, D. – Yao, Y. (2017): Manufacturing as the key engine of economic growth for middle-income economies. *Journal of the Asia Pacific Economy*, 22(1), pp. 47–70.

Sugawara, N. (2014): From volatility to stability in expenditure: Stabilization funds in resource-rich countries. *Working Paper*, No. 14/43, International Monetary Fund.

Sutherland, E. H. (1983): *White collar crime - the uncut version*. Yale University Press, New Haven.

Švarc, J. – Dabić, M. (2019): The Croatian path from socialism to European membership through the lens of technology transfer policies. *The Journal of Technology Transfer*, 44(5), pp. 1476–1504.

Szirmai, A. – Verspagen, B. (2015): Manufacturing and economic growth in developing countries, 1950–2005. *Structural Change and Economic Dynamics*, 34, pp. 46–59.

Szirmai, A. (2012): Industrialisation as an engine of growth in developing countries, 1950–2005. *Structural Change and Economic Dynamics*, 23(4), pp. 406–420.

Szirmai, A. (2013): Manufacturing and economic development. In (Eds.) Szirmai, A. – Naudé, W., Alcorta, L., *Pathways to industrialization in the twenty-first century. New challenges and emerging paradigms*. Oxford University Press, Oxford.

Tahirova, S. – Panahaliyeva, M. – Aliyev, S. (2021): Современные аспекты и перспективы торгово-экономических связей Азербайджана с постсоветскими республиками [Modern aspects and prospects of Azerbaijan's trade and economic relations with the post-Soviet republics]. In Proceddings of the 4th International Scientific and Practical Conference, *InterConf*, No. 57, pp. 90–101.

Taymas, Z. (1993): Azerbaijan country economic memorandum: from crisis to sustained growth. *World Bank Report*, No. 117.

The Collins English Dictionary. Definition of Dutch disease. Available at: https://www.collinsdictionary.com/dictionary/english/dutch-disease Accessed: 01 July 2022.

The Columbia Electronic Encyclopedia (2012): Sulfuric acid: Uses of sulfuric acid. Available at: https://www.infoplease.com/encyclopedia/science/chemistry/elements/sulfuric-acid/uses-of-sulfuric-acid Accessed 9 March 2022

The Economist. (1977): The Dutch disease. *The Economist*, 26, pp. 82–83.

The World Bank (1993): Статистический сборник 1993 год, Государства бывшего Советского Союза [Statistical Handbook 1993, State of the former USSR]. Statistical Handbook 1996, State of the former USSR. Washington DC, 111.

The World Bank (1996): *Statistical Handbook 1996, State of the former USSR*. The World Bank Group, Washington DC, 86.

Thurman, M. (2004): *Azerbaijan farm privatization project*. Case study from Reducing poverty, sustaining growthówhat works, what doesnít, and why a global exchange for scaling up success, The World Bank Group. Available at: https://web.worldbank.org/archive/website00819C/WEB/PDF/AZERBAIJ.PDF Accessed: 01 February 2021.

Timmer, M. – de Vries, G. J. – De Vries, K. (2015): Patterns of structural change in developing countries. In *Routledge handbook of industry and development*, pp. 79–97.

Tomljanović, M. – Grubišić, Z. – Huđek, I. (2018): Process of deindustrialization in Montenegro. *Journal of Central Banking Theory and Practice*, 7(2), pp. 99–121.

Tregenna, F. (2014): A new theoretical analysis of deindustrialization. *Cambridge Journal of Economics*, 38(6), pp. 1373–1390.

Treisman, D. (2000): The causes of corruption: A cross-national study. *Journal of public economics*, 76(3), pp. 399–457.

Trend News Agency (2015): Azərbaycan kimya sənayesinin inkişaf tarixi (FOTO) [History of Azerbaijan chemical industry development (PHOTO)]. Available at: https://az.trend.az/business/economy/2425120.html Accessed: 10.06.2022

Tsalik, S. – Ebel, R. E. (2003): *Caspian oil windfalls: Who will benefit?* Open Society Institute, Central Eurasia Project, New York.

Tsiouni, M. – Aggelopoulos, S. – Pavloudi, A. – Siggia, D. (2021): Economic and financial sustainability dependency on subsidies: The case of goat Farms in Greece. *Sustainability*, 13(13), 7441.

Tsui, K. K. (2010): Resource curse, political entry, and deadweight costs. *Economics & Politics*, 22(3), pp. 471-497.

Tufiş, C. (2010): Dividing the pie: Support for the free market and state interventionism models of market economy. In (Eds.) Voicu, M. – Halman, L., *Mapping value orientations in Central and Eastern Europe*, Brill, Leiden, pp. 71–106.

Tweyman, H. (2020): The democratic façade in Azerbaijan: An analysis. Available at: https://www.democracylab.uwo.ca/Archives/opinion_articles_/Azerbaijan%20real%20FINAL%20DRAFT.pdf Accessed: 11 January 2021.

Uçan, O. – Ünal, A. E. (2018): Hollanda Hastalığına sebep olabilecek makroekonomik etkenler: seçilmiş ülke ekonomileri üzerine bir analiz [Macroeconomic factors that may cause Dutch Disease: an analysis on selected country economies]. In *ICPESS 2018 Proceedings*, 2(2), pp. 376–393.

Ulbrych, M. (2017): The role of manufacturing in Central and Eastern EU member states. In *The Proceedings of the 17th International Joint Conference, Central and Eastern Europe in the Changing Business Environment*, Bratislava: Vydavateľstvo Ekonóm, pp. 245–260.

Ullah, B. (2020): Financial constraints, corruption, and SME growth in transition economies. *The Quarterly Review of Economics and Finance*, 75, 120–132.

Ünal, A. – Tagiyev, R. (2016): Sağlık sisteminde desantralizasyon: Türkiye ve Azerbaycan sağlık sistemleri üzerine bir inceleme [Decentralization in the health system: A review on the health systems of Turkey and Azerbaijan]. Journal of Süleyman Demirel University Institute of Social Sciences, CIEP Special Edition, pp. 479–497.

Üngör, M. (2013): De-agriculturalization as a result of productivity growth in agriculture. *Economics Letters*, 119(2), pp. 141–145.

United Nations Environment Programme – UNEP. (2012): Global chemicals outlook. Available at: https://vegyianyag.kormany.hu/download/a/90/50000/Global%20Chemicals%20Outlook%202012.pdf Accessed:15 March 2022.

Ursul, A. D. – Ursul, T. A. (2013): Obrazovaniye kak informazionniy prozess i perspektiva ego futurisazii [Education as information process and prospects of its futurization], *Sovremennoe obrazovaniye*, 2, pp. 1–57.

Usui, N. (2007): How effective are oil funds? Managing resource windfalls in Azerbaijan and Kazakhstan. *ERD Policy Brief Series*, No. 50, Asian Development Bank.

Vahabi, M. (2018): The resource curse literature as seen through the appropriability lens: A critical survey. *Public Choice*, 175(3-4), pp. 393–428.

Van der Ploeg, F. (2011): Natural resources: Curse or blessing? *Journal of Economic Literature*, 49(2), pp. 366–420.

van Gils, E. (2022): The inevitable non-performance of the Eastern Partnership in Azerbaijan: how regime type matters. *International Politics*, 1–20.

Van Neuss, L. (2015): Why did the industrial revolution start in Britain? *SSRN Electronic Journal*. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2696076 Accessed: 01 August 2021.

Van Neuss, L. (2018): Globalization and deindustrialization in advanced countries. *Structural Change and Economic Dynamics*, 45, pp. 49–63.

Vandyck, T. – Kitous, A. – Saveyn, B. – Keramidas, K. – Los Santos, L. R. – Wojtowicz, K. (2018): Economic exposure to oil price shocks and the fragility of oil-exporting countries. *Energies*, 11(4), 827.

Vidadili, N. – Suleymanov, E. – Bulut, C. – Mahmudlu, C. (2017): Transition to renewable energy and sustainable energy development in Azerbaijan. *Renewable and Sustainable Energy Reviews*, 80, pp. 1153–1161.

Villanueva, L. – Jiang, X. (2018): Patterns of technical change and de-industrialization. *PSL Quarterly Review*, 71(285), pp. 161–182.

Ville, S. – Wicken, O. (2013): The dynamics of resource-based economic development: Evidence from Australia and Norway. *Industrial and Corporate Change*, 22(5), pp. 1341–1371.

Wacziarg, R. (2012): The first law of petropolitics. *Economica*, *79*(316), pp. 641-657.

Wakeman-Linn, J. – Mathieu, P. – Van Selm, B. (2003): Oil funds in transition economies: Azerbaijan and Kazakhstan. In (Eds.) Davis J. M. – Ossowski R.– Fedelino, A., *Stabilization and Savings Funds for Nonrenewable Resources*, IMF Occasional Paper No. 205, International Monetary Fund, Washington DC, pp. 339–356.

Walker, C. – House, F. (2008): Azerbaijan's growing contradictions between economic and democratic development. Testimony prepared for delivery, Commission on Security and Cooperation in Europe, 29, 2008.

Wantchekon, L. (2002): Why do resource dependent countries have authoritarian governments? *Journal of African Finance and Economic Development*, 5(2), pp. 57–77.

Watkins, M. H. (1963): A staple theory of growth. *Canadian Journal of Economics and Political Science/Revue canadienne de economiques et science politique*, 29(2), pp. 141–158.

Weeks, J. (2008): Is a 'Resource Curse' inevitable in resource-rich countries. *Development Viewpoint*, 13, Centre for Development Policy and Research School of Oriental and African Studies.

Whittingham, M. J. – Stephens, P. A. – Bradbury, R. B. – Freckleton, R. P. (2006): Why do we still use stepwise modelling in ecology and behaviour? *Journal of Animal Ecology*, 75(5), pp. 1182–1189.

Wiens, D. (2014): Natural resources and institutional development. *Journal of Theoretical Politics*, 26(2), pp. 197–221.

Wigley, S. (2017): The resource curse and child mortality, 1961–2011. *Social Science & Medicine*, 176, pp. 142–148.

Wilson, R. A. – Briscoe, G. (2004): The impact of human capital on economic growth: A review. Impact of education and training. Third report on vocational training research in Europe: Background report. EUR-OP, Luxembourg.

Wood, A. (1994): *North-South trade, employment and inequality: Changing fortunes in a skill-driven world*. Clarendon Press, Oxford.

Wood, A. (1995): How trade hurt unskilled workers. *Journal of Economic Perspectives*, 9(3), pp. 57–80.

World Bank (2020): Data catalog: Oil rents (% of GDP). Available at: https://datacatalog.worldbank.org/oil-rents-gdp#:~:text=Oil%20rents%20are%20the%20difference,and%20total%20costs%20of%20production Accessed 30 December 2020.

World Bank Group. (2015): *Azerbaijan: Systematic Country Diagnostic*. World Bank.

World Bank. (1995): *Memorandum and Recommendation of the President of the International Development Association to the Executive Directors on a Proposed Credit of Sdr l1.5 Million to the Azerbaijan Republic for an Institution Building Technical Assistance Project* (P-6567-AZ). Available at: https://documents1.worldbank.org/curated/en/524781468210591290/pdf/multi0page.pdf Accessed: 11 November 2021.

World Bank. (1996): *Memorandum of the President of the International Bank for Reconstruction and Development and the International Development Association to the Executive Directors on a Country Assistance Strategy of the World Bank Group for the Azerbaijan Republic* (No. 15948-AZ; pp. 1–50). The World Bank. https://doi.org/10.1596/978-1-4648-0484-7 Accessed: 22 November 2021.

World Bank. (1999a): *Azerbaijan: Reconstruction of an Economy* (Evaluation Brief No. 27742; pp. 1–2). https://documents1.worldbank.org/curated/en/961231468769276951/pdf/1840Brief140Azerbijan.pdf Accessed: 28 November 2021.

World Bank. (1999b): *Memorandum of the President of the International Bank for Reconstruction and Development and the International Development Association to the Executive Directors on a Country Assistance Strategy of the World Bank Group for the Azerbaijan Republic* (No. 19892-AZ). The World Bank. Available at: https://doi.org/10.1596/978-1-4648-0484-7 Accessed: 21 November 2021.

World Bank. (2003): *Memorandum of the President of the International Bank for Reconstruction and Development and the International Development Association to the Executive Directors on a Country Assistance Strategy of the World Bank Group for the Azerbaijan Republic* (No. 25790-A2). The World Bank. Available at: https://doi.org/10.1596/978-1-4648-0484-7 Accessed: 21 November 2021.

World Bank. (2006a): *Second Institution Building Technical Assistance Project (Credit 3663-AZ) Proposed Project Restructuring and Amendment of the Development*

Credit Agreement (No. 35481; pp. 1–13). Available at: https://documents1.worldbank.org/curated/en/470841468220795593/pdf/35481.pdf Accessed: 21 November 2021.

World Bank. (2006b): *Project Appraisal Document on a Proposed Credit in the Amount of Sdr 14.8 Million (Uss 21.6 Million Equivalent) to the Republic of Azerbaijan for a Judicial Modernization Project* (No. 35447–142; pp. 1–111). https://documents1.worldbank.org/curated/en/988391468209664488/pdf/354471AZ0judicial0mod.pdf

World Bank. (2009): *Running a Business in Azerbaijan* (No. 52112; Enterprise Surveys Country Note Series). Available at: https://documents1.worldbank.org/curated/en/780921468009634322/pdf/521120BRI0Azer10Box345551B01PUBLIC1.pdf Accessed: 21 November 2021.

World Bank. (2015): Azerbaijan: Systematic Country Diagnostic. World Bank. Available at: https://doi.org/10.1596/23105 Accessed: 21 November 2021.

World Bank. (2017): *Republic of Azerbaijan*. World Bank, Washington, DC. Available at: https://doi.org/10.1596/30207 Accessed: 21 November 2021.

World Bank. (2019): *Competitiveness in Azerbaijan – A Call to Action*. Available at: https://documents1.worldbank.org/curated/en/750521574394472932/pdf/Competitiveness-in-Azerbaijan-A-Call-to-Action.pdf Accessed: 21 November 2021.

World Trade Organization. (2010): *World Trade Report*. World Trade Organization.

Wright, G. – Czelusta, J. (2004): Why economies slow: The myth of the resource curse. *Challenge*, 47(2), pp. 6–38.

Wright, J. (2003): Forecasting U.S. inflation by Bayesian model averaging. Board of Governors of the Federal Reserve System, *International Finance Discussion Papers*, No. 780.

Yi-Chong, X. (2010): The political economy of sovereign wealth funds. In (Eds.) Yi-Chong, X. – Bahgat, G., *The political economy of sovereign wealth funds*, International Political Economy Series. Palgrave Macmillan, London, pp. 1-25.

Yıldırım Mızrak, N. – Gurbanov, S. (2013): Azerbaycanda enerji kaynakları sektöründe yaşanan Hollanda hastalığı'nın makroekonomik etkileri: Karşılaştırmalı analiz [Macroeconomic effects of the Dutch disease in the energy resources sector in Azerbaijan: Comparative analysis]. In EkonAnadolu 2013 – Anadolu International Conference in Economics June 19–21, 2013, Eskişehir – Turkey.

Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2329172 Accessed: 13 April 2020.

Yoshikawa, H. (1995): Manufacturing and the 21st century—intelligent manufacturing systems and the renaissance of the manufacturing industry. *Technological Forecasting and social change*, 49(2), pp. 195–213.

Yu, H. – Hu, C. – Xu, B. (2022): Re-examining the existence of a "resource curse": A spatial heterogeneity perspective. Journal of Business Research, 139, 1004–1011.

Yun, K. (2018): Dutch disease in post-soviet oil exporting countries: Impact of real appreciation on de-industrialization. *East Asian Community Review*, 1, pp. 199–219.

Yunusov, A. (2012): Twenty years of independence in Azerbaijan. *Moldoscopie*, 56(1), pp.154–165.

Zaostrovtsev, A. (2016): From Marxist economics to post-Soviet nationalism. In (Eds.) Barnett, V. – Zweynert, J., *Economics in Russia*, Routledge, Londong, pp. 173–185.

Zhan, Z. – Naqvi, B. – Rizvi, S. K. A. – Cai, X. (2021): How exchange rate regimes are exacerbating or mitigating the resource curse? *Resources Policy*, 72, pp. 102–122.

Zhou, J. (2013): Digitalization and intelligentization of manufacturing industry. *Advances in Manufacturing*, 1(1), pp. 1–7.

Zulfigarov, F. – Neuenkirch, M. (2019): Azerbaijan and its oil resources: Curse or blessing? *Universitat Trier, Research Papers in Economics*, No. 11/19.

Крюков, Л. М. (2005): Новая Европа: Доклад о трансформации. [Kryukov, L. M (2005): New Europe: Transformation Report]. Available at: http://edoc.bseu.by:8080/bitstream/edoc/4039/2/Kryukov_L_M_2005_4_ocr.pdf Accessed: 14 September 2021

Сулейманов, Г. С. – Туркан, Ш. А. (2019): Организационно-экономические механизмы кластерного управления предприятиями химической промышленности Азербайджана [Suleymanov, G. S. – Turkan, Sh. A (2019): Organizational and economic mechanisms of cluster management of chemical industry enterprises in Azerbaijan]. *Науковий вісник Івано-Франківського національного технічного університету нафти і газу. Серія: Економіка та управління в нафтовій і газовій промисловості*, (2), pp. 196–209.

APPENDIX

Table A4.1: Descriptive statistics of the variables of interest used in NRC studies.

Variable	N	Min	Max	Mean	St.Dev.
OP_EXP_PC	20	73.441	507.431	253.153	165.389
H_RIGHTS	20	-0.518	-0.021	-0.326	0.133
TGEE	20	2.068	3.854	2.821	0.470
OIL_RENTS	20	12.037	39.558	25.998	7.674
EDI	20	0.000	4.911	1.936	1.440
OIL_ EXP/GDP	20	0.296	1.964	0.603	0.356
OIL_FDI	20	546.100	7,448.300	4,240.899	1,958.284
SH_SOFAZ	20	7.300	62.430	35.426	20.730

Source: The author's own calculations based on the collected data.

Table A4.2: Normality test, outlier and missing values of the variables of interest used in NRC studies.

Variable	Shapiro-Wilk Test		Outliers	Missing value
	Stat.	Sig.		
OP_EXP_PC	0.851	0.005		2019
H_RIGHTS	0.904	0.049	2001	2018; 2019
TGEE	0.949	0.351		2019
OIL_RENTS	0.971	0.769		2019
EDI	0.910	0.063		2019
OIL_ EXP/GDP	0.650	0.000	2008	
OIL_FDI	0.964	0.627		2018; 2019
SH_SOFAZ	0.833	0.003		
MINING_SHARE	0.927	0.134		

Source: The author's own calculations based on the collected data.

Table A4.3: Descriptive statistics of the variables of interest used in DD studies.

Variables	N	Min	Max	Mean	St.Dev.
REER_66	30	0.73	140.53	86.89	37.43
NEER_66	30	48.58	16,385.68	859.41	3,014.34
Oil_prices	30	12.76	111.63	49.18	32.42
Oil_rents	30	3.68	39.68	21.50	9.42
EDI	30	0.00	4.91	1.42	1.41
SB_OUT_SH	30	11.70	85.40	62.11	21.74
SM_OUT_SH	30	6.90	83.20	24.76	21.81
SM_VA_SH	30	3.99	21.88	8.03	4.78
SA_VA_SH	30	5.08	32.35	13.57	9.10
SNT_VA_SH	30	21.76	43.34	33.08	5.36
SB_EMP_SH	30	0.58	1.11	0.93	0.14
SL_EMP_SH	30	34.97	47.42	43.06	2.63
SNT_EMP_SH	30	51.51	64.45	56.00	2.75
SB_EXP_SH	30	0.22	97.10	73.35	27.85
SL_EXP_SH	30	2.90	99.78	26.65	27.85
SB employed, thsd. persons	19	37.90	44.30	41.30	2.00
SL employed, thsd. persons	19	1,696.7	2,024.1	1,842.7	99.40
SNT employed, thsd. persons	19	2068.4	2,746.3	2,371.1	226.20
SB output, current mil. AZN	19	2,186.7	37761.7	17,765.5	11,416.3
SL output, current mil. AZN	19	2102.2	14,645.2	7,303.9	3,974.0

SNT output, current mil. AZN	19	1,092.0	14871.8	6,760.8	4,746.4
SB real wages, AZN	19	333.25	2,120.44	1,164.3	534.3
SL real wages, AZN	19	72.11	328.59	204.50	88.70
SNT real wages, AZN	19	111.67	447.98	335.40	112.00
SB returns on capital, ratio	19	1.19	7.23	4.14	2.15
SL returns on capital, ratio	19	1.84	11.90	5.05	3.01
SNT returns on capital, ratio	19	1.06	3.28	1.81	0.72
SB employed, thsd. persons	19	37.90	44.30	41.30	2.00
REER_66	84	75.20	149.60	107.20	20.20
MIN_EMP	84	33.50	92.30	43.90	15.70
MAN_EMP	84	84.10	268.20	129.00	47.30
SERV_EMP	84	757.40	1,424.80	1,100.40	171.80
CPI, in %	19	98.80	125.30	104.62	6.25
INC_USD	19	4,523.10	50,321.50	24,180.51	15,865.62
INC_AZN	19	4,047.30	53,688.60	24,200.48	16,998.74
MPC	19	0.49	1.77	0.85	0.35
GOV_SPEND_USD	19	0.77	8.19	4.01	2.61
GOV_SPEND_SHARE_GDP	19	8.50	15.15	11.27	1.71
ST_BUD_EXP	120	382.90	26,416.30	9,518.44	6,050.88
CPI_ANAVE	120	0.20	14.00	5.08	4.19

Source: The author's own calculations based on the collected data.

Table A4.4: Normality test, outlier and missing values of the variables of interest used in DD study.

Variables	**Shapiro-Wilk Test**		**Outliers (years)**	**Missing values (years)**
	Statistic	Sig.		
REER_66	0.895	0.006	1990, 1991, 1992,	
NEER_66	0.282	0.000	1990, 1991, 1992, 1993	
Oil_Prices	0.874	0.002		
Oil_rents	0.971	0.578		
EDI	0.861	0.001	2008; 2010	1990, 1991, 1992, 1993
SB_OUT_SH	0.854	0.001	1990, 1991, 1992, 1993	
SM_OUT_SH	0.705	0.000	1990, 1991, 1992, 1993, 1994, 1995	
SM_VA_SH	0.765	0.000	1990, 1991, 1992, 1993	
SA_VA_SH	0.834	0.000		
SNT_VA_SH	0.974	0.654		
SB_EMP_SH	0.895	0.006		
SL_EMP_SH	0.862	0.001	1996, 1997, 1998	
SNT_EMP_SH	0.861	0.001	1996, 1997, 1998	
SB_EXP_SH	0.750	0.000	1990, 1991, 1992	
SL_EXP_SH	0.750	0.000	1990, 1991, 1992	
SB employed, thsd. persons	0.942	0.854		
SL employed, thsd. persons	0.963	0.952		
SNT employed, thsd. persons	0.926	0.651		2018
SB output, current mil. AZN	0.906	0.824		
SL output, current mil. AZN	0.942	0.854		
SNT output, current mil. AZN	0.900	0.000		

SB real wages, AZN	0.944	0.651	
SL real wages, AZN	0.918	0.65	
SNT real wages, AZN	0.850	0.000	
SB returns on capital, ratio	0.911	0.921	
SL returns on capital, ratio	0.837	0.000	
SNT returns on capital, ratio	0.772	0.000	
REER_66	0.925	0.000	
MIN_EMP	0.850	0.000	
MAN_EMP	0.896	0.000	
SERV_EMP	0.952	0.004	
INC_USD	0.906	0.063	
INC_AZN	0.907	0.065	
MPC	0.866	0.120	2000, 2018
GOV_SPEND_USD	0.900	0.005	
CPI, in %	0.779	0.000	
GOV_SPEND_SHARE_GDP	0.964	0.667	
ST_BUD_EXP	0.787	0.000	
CPI_ANAVE	0.787	0.003	

Source: The author's own calculations based on the collected data.

Table A5.1: Total variance explained of the variables related to institutional quality and the oil sector in Azerbaijan's economy.

Total Variance Explained									
Comp.	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %
1	3.388	48.401	48.401	3.388	48.401	48.401	3.337	47.672	47.672
2	2.228	31.824	80.225	2.228	31.824	80.225	2.279	32.553	80.225

Source: The author's own calculations based on the collected data.
Notes: Comp. = components; Var. = variance; Cum. = cumulative.

Table A5.2: Unit root test results (augmented Dickey–Fuller) of the principal components used in Chapter 3.

Null Hypothesis: The variable has a unit root			
		At Level	
		OIL_FACTOR	INSTITUTIONS
With Constant	t-Statistic	−1.7234	−1.3903
	Prob.	0.4074	0.5699
		n0	n0
With Constant & Trend	t-Statistic	−1.5259	−2.7407
	Prob.	0.7916	0.2319
		n0	n0
Without Constant & Trend	t-Statistic	−1.7570	−1.4118
	Prob.	0.0750	0.1432
		*	n0
		At First Difference	
		d(OIL_FACTOR)	d(INSTITUTIONS)
With Constant	t-Statistic	−5.4093	−4.3425

	Prob.	0.0002 ***	0.0026 ***
With Constant & Trend	t-Statistic	−5.5958	−4.2568
	Prob.	0.0008 ***	0.0140 **
Without Constant & Trend	t-Statistic	−5.5223	−3.8707
	Prob.	0.0000 ***	0.0005 ***

Source: The author's own calculations based on the collected data.
Notes: (1) (*) Significant at the 10% level; (**) significant at the 5% level; (***) significant at the 1% level and (no) nonsignificant; (2) lag length based on the Akaike information criterion; (3) probability based on MacKinnon's (1996) one-sided p values.

Table A5.3: Unit root test results (ADF) of REER and oil prices variables used in section 5.2.1.

Null Hypothesis: the variable has a unit root			
	At Level		
		REER	OIL_P
With Constant	t-Statistic	-2.8709	-2.3039
	Prob.	***0.0500***	***0.1714***
		**	n0
With Constant & Trend	t-Statistic	-2.6123	-2.5380
	Prob.	***0.2751***	***0.3096***
		n0	n0
Without Constant & Trend	t-Statistic	0.0871	-0.9338
	Prob.	***0.7097***	***0.3115***
		n0	n0
	At First Difference		
		d(REER)	d(OIL_P)
With Constant	t-Statistic	-11.9128	-11.8874
	Prob.	***0.0000***	***0.0000***
		***	***
With Constant & Trend	t-Statistic	-11.9761	-11.8811
	Prob.	***0.0000***	***0.0000***
		***	***
Without Constant & Trend	t-Statistic	-11.9084	-11.9026
	Prob.	***0.0000***	***0.0000***
		***	***

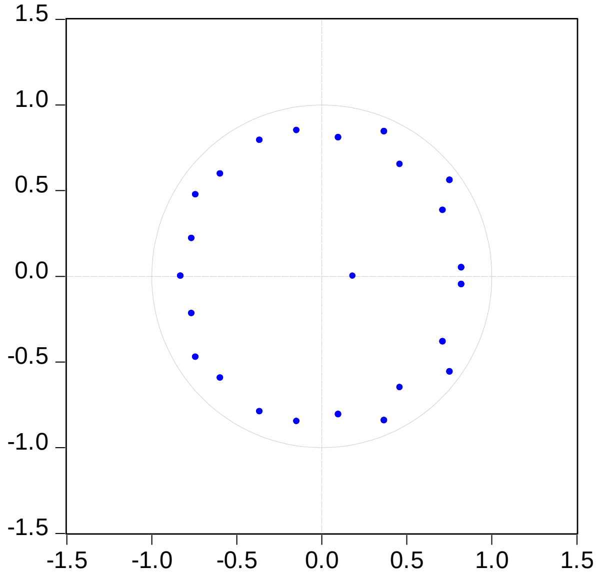
Source: The author's own calculations based on the collected data.
Notes:
a: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1% and (no) Not Significant
b: Lag Length based on SIC
c: Probability based on MacKinnon (1996) one-sided p-values.

Table A5.4: The VAR optimum lag order selection criteria, 1995M01–2020M12.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1636.68	NA	247.09	11.19	11.21	11.20
1	-1599.00	74.58	196.35	10.96	11.03*	10.99
2	-1590.76	16.20	190.75	10.93	11.05	10.98*
6	-1578.99	6.93	196.36	10.96	11.28	11.09
10	-1557.58	16.42	189.30	10.92	11.45	11.13
12	-1544.35	15.76*	182.74*	10.88*	11.51	11.13
16	-1538.29	2.10	195.77	10.95	11.78	11.28
18	-1536.09	1.63	203.84	10.99	11.92	11.36

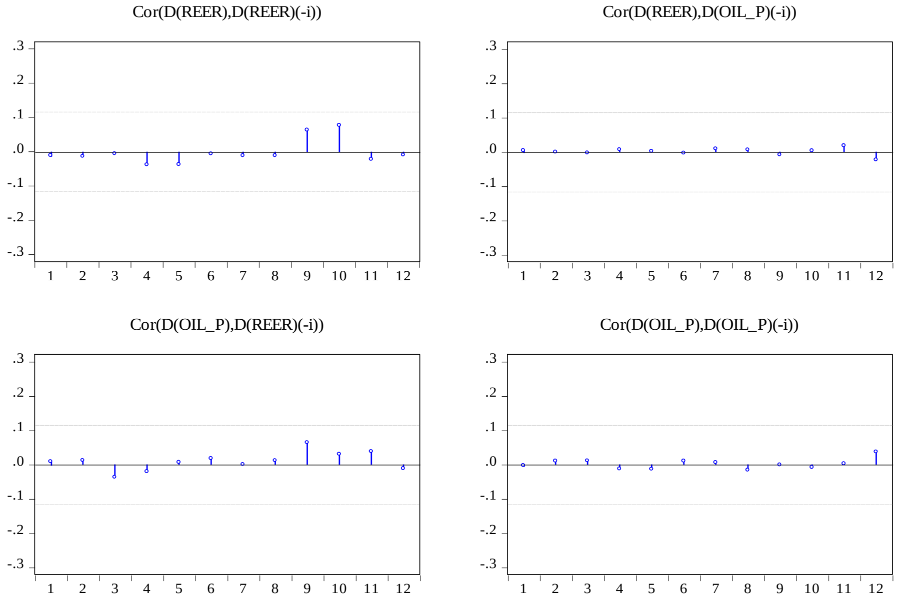
Source: The author's own calculations based on the collected data.
Notes: endogenous variables: D(REER) and D(OIL_P); exogenous variables: C; * indicates the lag order selected by the criterion; LR: a sequential modified LR test statistic (each test at the 5% level); FPE: Final prediction error; AIC: the Akaike information criterion; SC: the Schwarz information criterion; HQ: the Hannan-Quinn information criterion; the values were rounded to the second decimal point for compactness.

Figure A5.1: Auto-Regressive (AR) characteristic polynomial inverse roots o the VAR model.



Source: The author's own calculations based on the collected data.

Figure A5.2: Autocorrelations with approximate 2 standard error bounds for REER appreciation



Source: The author's own calculations based on the collected data.

Table A5.5: VAR residual serial correlation LM tests.

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	2.98	4	0.561	0.75	(4, 542.0)	0.561
2	4.15	4	0.386	1.04	(4, 542.0)	0.386
3	4.87	4	0.301	1.22	(4, 542.0)	0.301
4	6.47	4	0.167	1.62	(4, 542.0)	0.167
5	4.80	4	0.308	1.20	(4, 542.0)	0.308
6	1.71	4	0.789	0.43	(4, 542.0)	0.789
7	1.08	4	0.897	0.27	(4, 542.0)	0.897
8	2.37	4	0.667	0.59	(4, 542.0)	0.667
9	12.06	4	0.017	3.04	(4, 542.0)	0.017
10	10.19	4	0.037	2.57	(4, 542.0)	0.037
11	3.72	4	0.445	0.93	(4, 542.0)	0.445
12	3.24	4	0.519	0.81	(4, 542.0)	0.519

Source: The author's own calculations based on the collected data.
Notes: numbers were rounded to the second decimal point for compactness (excluding the probability values).

Table A5.6: Unrestricted co-integration among the variables of interest related to the sectoral implication of REER, NEER, oil prices, and oil rents, for the period 1990–2019.

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
Value added				
None *	0.99	376.25	159.53	0.000

At most 1 *	0.90	245.67	125.62	0.000
At most 2 *	0.89	180.70	95.75	0.000
At most 3 *	0.82	118.85	69.82	0.000
At most 4 *	0.78	71.46	47.86	0.000
Employment				
None *	0.96	287.01	175.17	0.00
At most 1 *	0.92	193.22	139.28	0.000
At most 2 *	0.72	122.33	107.35	0.000
At most 3 *	0.64	86.75	79.34	0.010
At most 4 *	0.61	58.43	55.25	0.030
At most 7 *	0.24	7.74	3.84	0.010
Exports				
None *	0.88	206.73	125.62	0.000
At most 1 *	0.84	147.13	95.75	0.000
At most 2 *	0.80	96.21	69.82	0.000
At most 3 *	0.49	51.33	47.86	0.020
At most 4 *	0.44	32.49	29.80	0.020
At most 5 *	0.30	16.04	15.49	0.040
At most 6 *	0.19	6.02	3.84	0.010

Source: The author's own calculations based on the collected data.

Table A5.7: Augmented Dickey–Fuller (ADF) unit root test of the variables of interest used in resource movement (employment) VAR model.

	At Level					
		MAN	**MINING**	**OIL_PRICE**	**REER**	**SERVICES**
With Constant	t-Statistic	-1.3377	-2.2696	-2.5541	-1.2623	-0.5424
	Prob.	***0.6082***	***0.1842***	***0.1068***	***0.6437***	***0.8762***
		n0	n0	n0	n0	n0
With Constant & Trend	t-Statistic	-1.4497	-3.7627	-2.4272	-1.2263	-2.9812
	Prob.	***0.8382***	***0.0239***	***0.3632***	***0.8982***	***0.1441***
		n0	**	n0	n0	n0
Without any Constant & Trend	t-Statistic	0.6805	-0.7599	-0.6120	-0.0561	2.1897
	Prob.	***0.8607***	***0.3842***	***0.4493***	***0.6612***	***0.9929***
		n0	n0	n0	n0	n0
	At First Difference					
		d(MAN)	**d(MINING)**	**d(OIL_PRICE)**	**d(REER)**	**d(SERVICES)**
With Constant	t-Statistic	-3.8325	-3.5432	-7.5232	-8.2174	-3.1126
	Prob.	***0.0039***	***0.0093***	***0.0000***	***0.0000***	***0.0297***
		***	***	***	***	**
With Constant & Trend	t-Statistic	-4.0690	-3.6447	-7.5957	-8.1759	-3.0902
	Prob.	***0.0101***	***0.0324***	***0.0000***	***0.0000***	***0.1159***
		**	**	***	***	n0
Without any Constant & Trend	t-Statistic	-3.8758	-3.5700	-7.5706	-8.2659	-2.0189
	Prob.	***0.0002***	***0.0005***	***0.0000***	***0.0000***	***0.0423***
		***	***	***	***	**

Source: The author's own calculations based on the collected data.

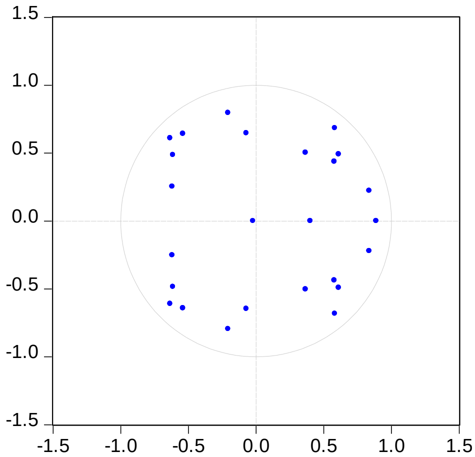
Notes: 1) Here, n0 means the null hypothesis. This hypothesis indicates that the series has a unit root; 2) the symbols *, **, and *** indicate a statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A5.8: VAR optimum lag length criteria.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1020.211	NA	252577.1	26.62885	26.78104	26.68973
1	-950.3427	128.8475	78876.96	25.46345	26.37662*	25.82871*
2	-935.4083	25.60184	103295.0	25.72489	27.39904	26.39453
3	-920.7449	23.23291	137956.7	25.99337	28.42850	26.96740
4	-876.4074	64.49086	86900.87	25.49110	28.68720	26.76951
5	-829.1269	62.63132*	52098.74*	24.91239*	28.86946	26.49518
6	-808.3481	24.82672	64480.44	25.02203	29.74008	26.90921

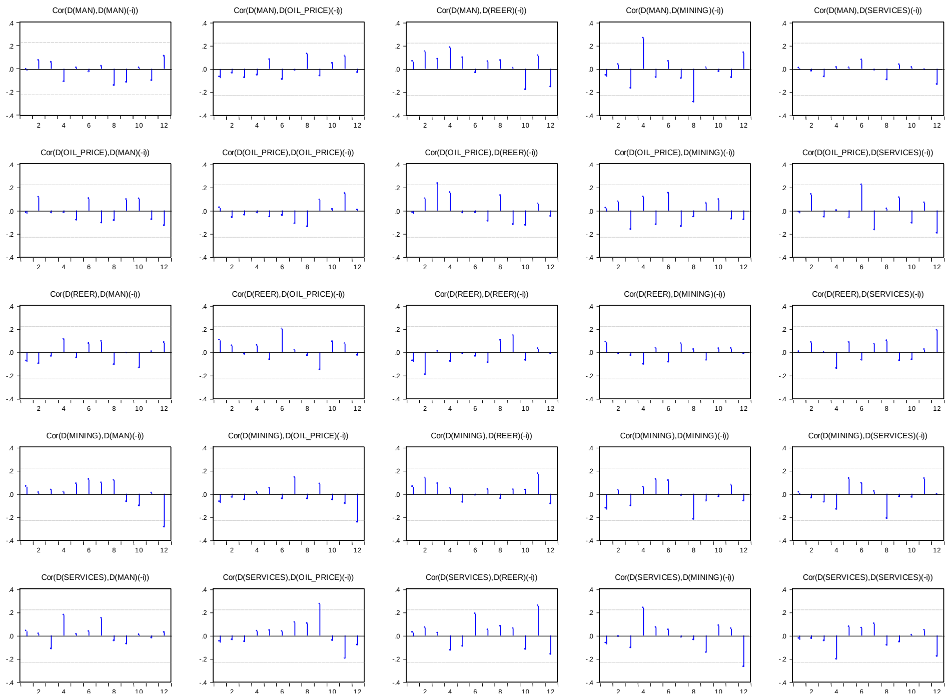
Source: The author's own calculations based on the collected data.
Notes: Here, * indicates the suggested lag length; LR: sequential modified LR test statistic (each test at the 5% level); FPE: final prediction error; AIC: the Akaike information criterion; SC: the Schwarz information criterion; HQ: the Hannan-Quinn information criterion.

Figure A5.3: Inverse roots of auto-regressive (AR) characteristic polynomial.



Source: The author's own calculations based on the collected data.

Figure A5.4: Autocorrelations with approximate 2 standard error bounds.



Source: The author’s own calculations based on the collected data.

Table A5.9: VAR residual serial correlation LM tests.

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	20.76	25	0.706	0.82	(25, 161.2)	0.708
2	25.25	25	0.449	1.02	(25, 161.2)	0.451
3	27.00	25	0.357	1.09	(25, 161.2)	0.360
4	59.66	25	0.001	2.66	(25, 161.2)	0.001
5	22.38	25	0.614	0.89	(25, 161.2)	0.616

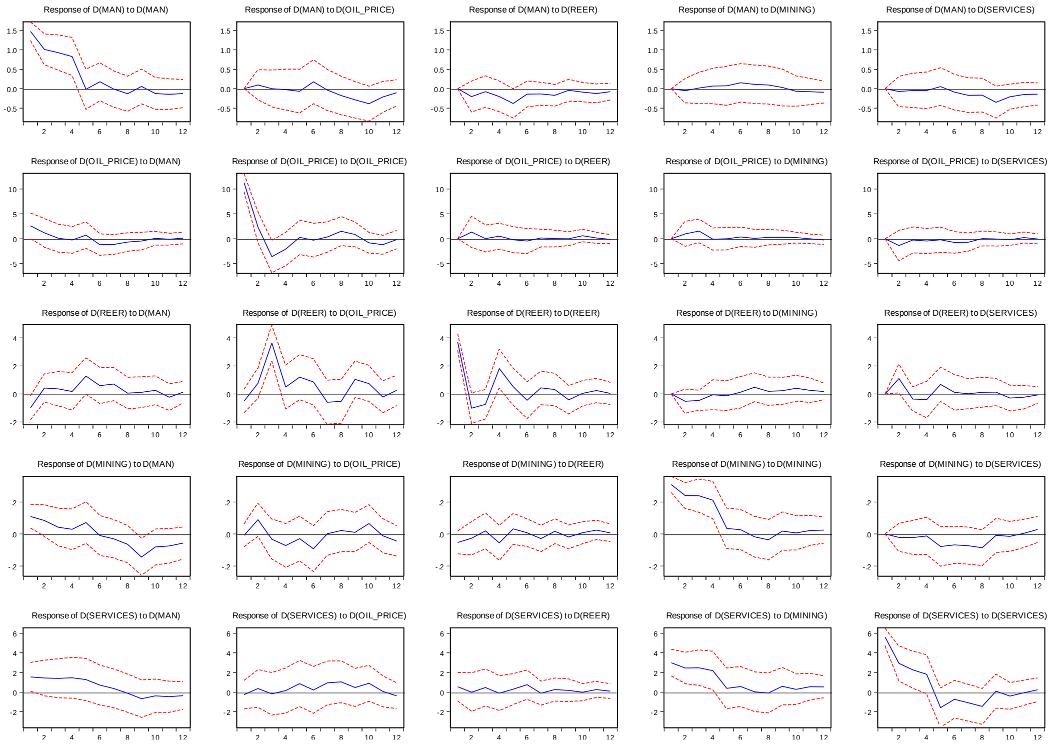
Source: The author’s own calculations based on the collected data.
Notes: Figures were rounded to the second decimal point for the sake of compactness (excluding the probability values).

Table A5.10: Variance decomposition of manufacturing employment (DMAN).

Period	S.E.	D(MAN)	D(OIL_PRICE)	D(REER)	D(MINING)	D(SERVICES)
1	1.48	100.00	0.00	0.00	0.00	0.00
2	1.81	98.20	0.28	1.27	0.08	0.17
3	2.03	98.38	0.22	1.14	0.07	0.18
4	2.21	97.66	0.20	1.80	0.15	0.20
5	2.24	94.60	0.28	4.62	0.26	0.25
6	2.26	93.12	0.90	4.89	0.70	0.40
7	2.28	92.05	0.91	5.17	0.93	0.95
8	2.30	90.40	1.49	5.60	1.07	1.44
9	2.35	87.04	2.93	5.42	1.05	3.57
10	2.39	83.98	5.42	5.35	1.08	4.16
11	2.41	82.75	6.10	5.50	1.16	4.48
12	2.43	82.18	6.22	5.55	1.29	4.76

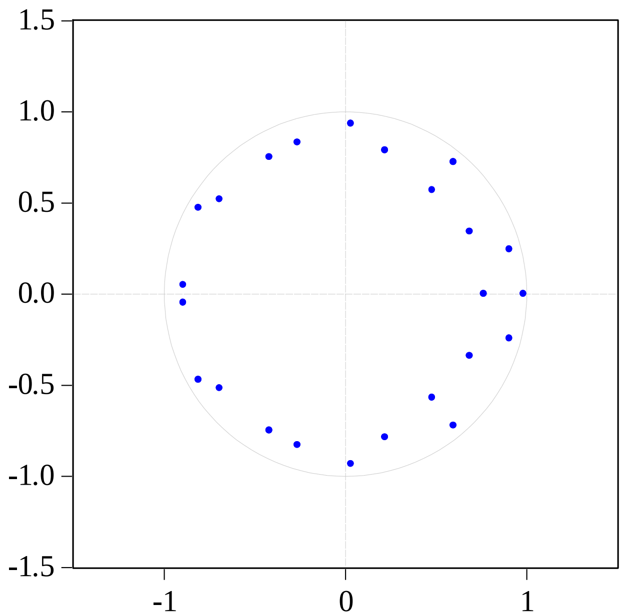
Source: The author’s own calculations based on the collected data.
Notes: 1) Figures were rounded to the second decimal point for the sake of compactness; 2) S.E. means standard error.

Figure A5.5: All impulse response functions used in the resource movement VAR analysis.



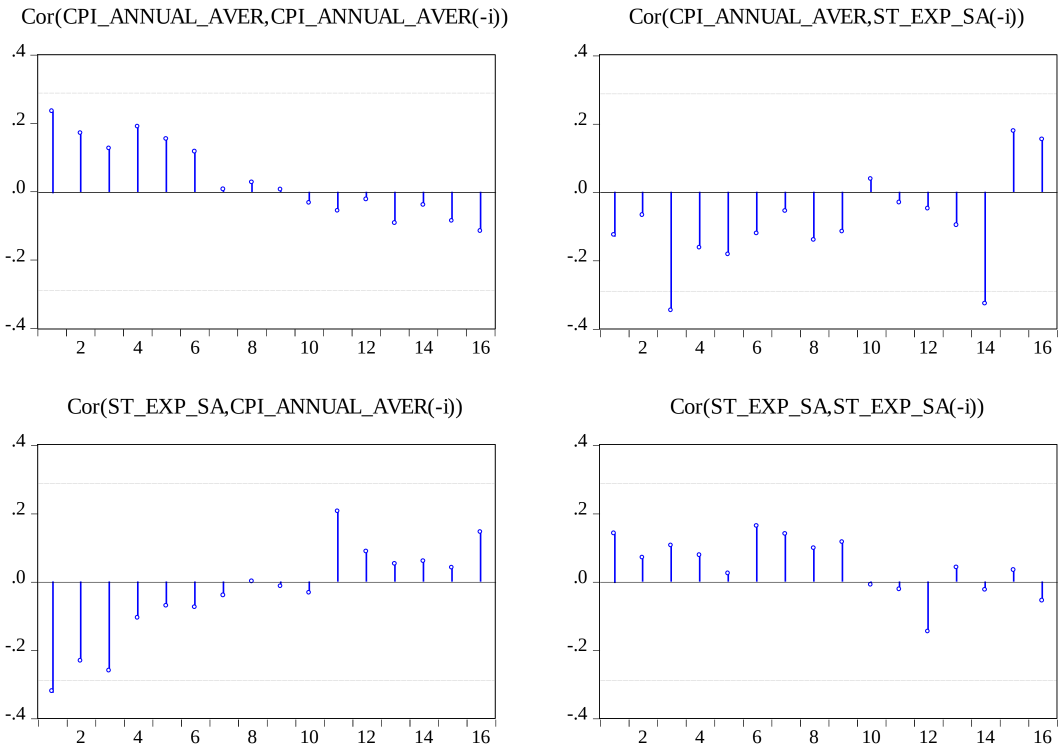
Source: The author's own calculations based on the collected data.

Figure A5.6: Auto-regressive (AR) characteristic polynomial inverse roots of the VAR model for spending effect.



Source: The author's own calculations based on the collected data.

Figure A5.7: Autocorrelations with approximate 2 standard error bounds for spending effect.



Source: The author's own calculations based on the collected data.

Table A5.11: Variance decomposition of CPI_ANNUAL_AVER, spending effect.

Period	S.E.	CPI_ANNUAL_AVER	ST_EXP_SA
1	0.463003	100.0000	0.000000
2	0.581928	99.91876	0.081242
3	0.640073	99.74626	0.253743
4	0.676141	98.21687	1.783126
5	0.699983	96.61699	3.383011
6	0.726776	94.06954	5.930465
7	0.748586	91.64262	8.357377
8	0.764824	89.88912	10.11088
9	0.785350	87.04781	12.95219
10	0.804710	84.11712	15.88288
11	0.819777	81.75905	18.24095
12	0.822720	81.19140	18.80860
13	0.824997	80.91143	19.08857
14	0.828521	80.79462	19.20538
15	0.830931	80.88819	19.11181
16	0.833275	80.99100	19.00900

Source: The author's own calculations based on the collected data.

Table A5.12: Unit root tests of the variables of interest.

	At level		First difference		Decision
	ADF	**PP**	**ADF**	**PP**	
Dependent variables					
Caustic soda	-3.24	-2.24	-4.83***	-4.84***	I(1)
Chlorine	-1.98	-1.88	-6.26***	-6.25***	I(1)
Hydrochloric acid	-2.07	-2.07	-4.92***	-4.93***	I(1)
Isopropyl	-2.08	-2.06	-7.20***	-7.13***	I(1)
Liquid soda	-2.56	-2.61	-6.26***	-6.27***	I(1)
Sulphuric acid	-4.72***	-4.72***	-8.24***	-15.01***	I(1)
Explanatory variables					
Oil prices	-1.16	-1.31	-4.18***	-4.17***	I(1)
Oil boom	-1.20	-1.20	-4.80***	-4.80***	I(1)
RLP	-4.87***	-4.81***	-6.50***	-6.56***	I(1)
REER	-3.13	-1.54	-3.27*	-3.16***	I(1)
Services emp.	-4.35**	-4.94***	-5.29***	-4.67***	I(1)

Source: The author's own calculations based on the collected data.
Notes: 1) ADF and PP unit root tests were performed with constant and trend, at maximum lag of 1; 2) the symbols *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively; 3) numbers were rounded to the second decimal point for compactness; 4) the values indicated in the table are t-statistics.

Table A5.13: Correlation matrix of the variables of interest.

		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	CAUSTIC_SODA_SOLID	1.00									
2	CHLORINE	**0.72**	1.00								
3	HYDROCHLORIC_ACID	0.56	**0.71**	1.00							
4	IZOPROPYL_ALCOHOL	0.44	**0.74**	0.60	1.00						
5	LIQUID_SODA	0.48	**0.68**	**0.93**	0.56	1.00					
6	OIL_BOOM	-0.28	0.14	-0.19	0.20	-0.18	1.00				
7	OIL_PRICES	-0.29	-0.06	-0.53	0.02	-0.52	**0.82**	1.00			
8	REER_170	-0.53	-0.42	-0.59	-0.21	-0.61	**0.73**	**0.76**	1.00		
9	RLP_CHEMICAL	-0.11	-0.07	0.55	-0.01	0.61	-0.16	-0.53	-0.19	1.00	
10	SERVICES_EMPLOYMENT	-0.47	-0.45	**-0.81**	-0.39	**-0.80**	0.27	0.62	0.46	**-0.70**	1.00
11	SULPHURIC_ACID	0.22	0.51	**0.77**	0.45	**0.80**	-0.06	-0.37	-0.35	0.62	**-0.75**

Source: The author's own calculations based on the collected data.
Note: numbers were rounded to the second decimal point for compactness;

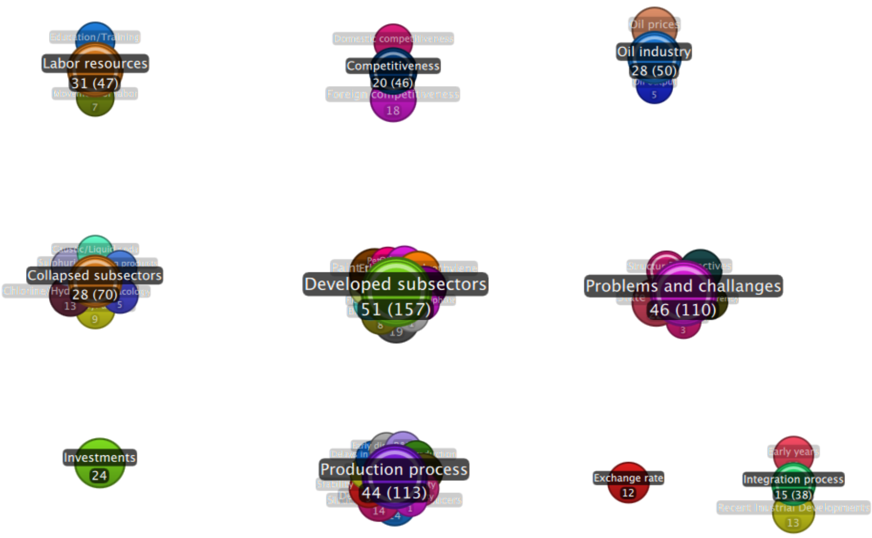
Table A5.14: Johansen cointegration analysis of the subsectors of chemicals industry.

Rank	*Trace Statistic*	*0.05 Critical Value*	*Max-Eigen Statistic*	*0.05 Critical Value*
Caustic Soda (solid)				
R=0	131.83	95.75	50.25	40.08
R ≤ 1	81.58	69.82		
R ≤ 2	51.16	47.86		
Chlorine				
R=0	121.06	95.75		
R ≤ 1	85.60	69.82		
R ≤ 2	54.63	47.86		
R ≤ 3	30.39	29.80		
Hydrochloric Acid				
R=0	117.15	95.75	40.46	40.08
R ≤ 1	76.69	69.82		
R ≤ 2	49.82	47.86		
Izopropyl Alcohol				
R=0	122.21	95.75	45.05	40.08
R ≤ 1	77.17	69.82		

Liquid Soda				
R=0	183.69	95.75	43.34	40.08
R ≤ 1	95.35	69.82	39.69	33.88
R ≤ 2	55.66	47.86		
R ≤ 3	31.22	29.80	21.71	21.13
Sulphuric acid				
R=0	179.21	95.75	92.06	40.08
R ≤ 1	87.15	69.82	39.08	33.88
R ≤ 2	48.06	47.86	28.10	27.58

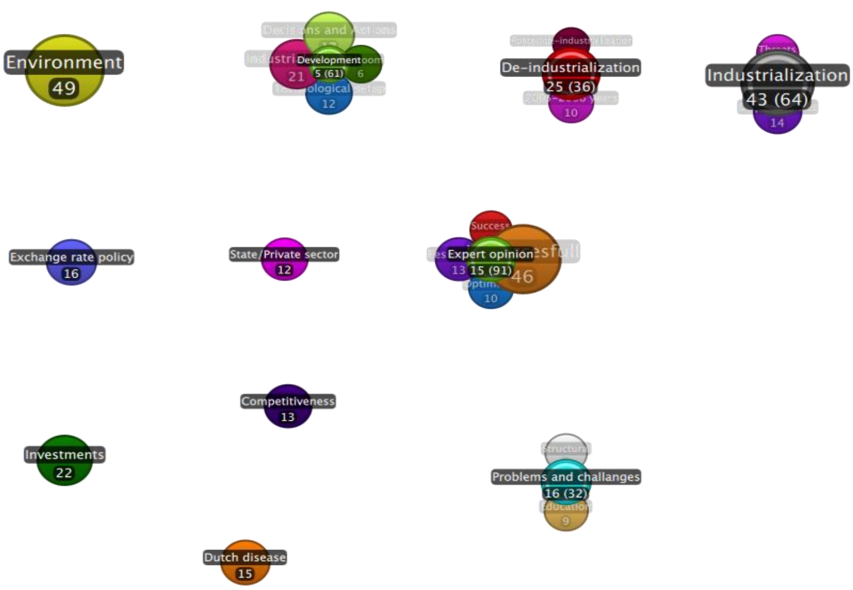
Source: The author’s own calculations based on the collected data.

Figure A5.8: Codes and groupings of the qualitative analysis of the industry experts



Source: The author’s own calculations based on the collected data.

Figure A5.9: Codes and groupings of the qualitative analysis of the economists



Source: The author’s own calculations based on the collected data.

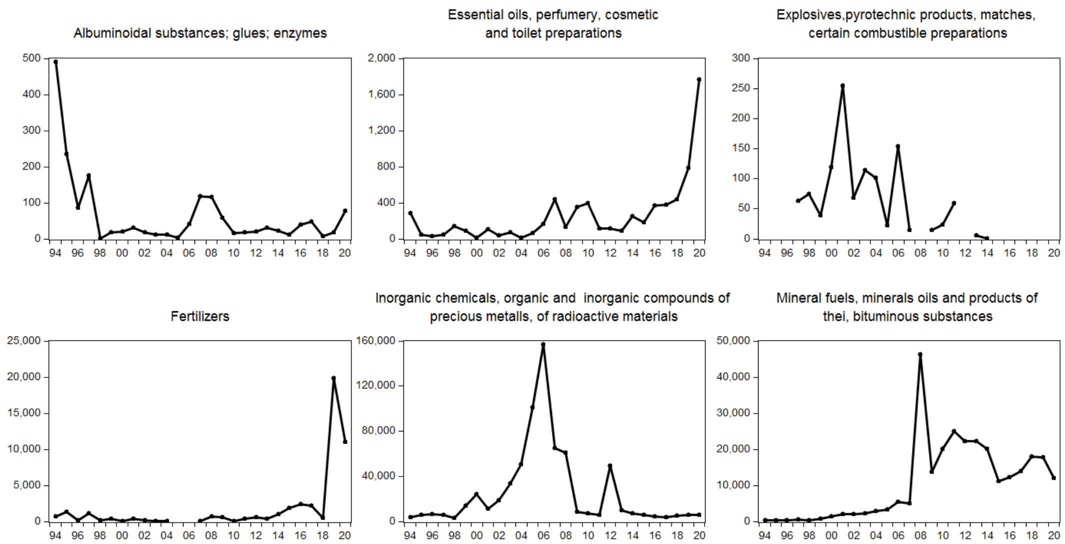
Table A5.15: Interview questions.

	Questions for the industry experts	Questions for the economists
1.	How would you define the current status of growth and development of the chemicals industry in Azerbaijan?	Is there a necessary institutional and political environment in Azerbaijan for the non-oil manufacturing sector to serve the industrialization of the national economy?
2.	Has the potential of the chemical industry left over from the USSR been used effectively since the years of independence? In what year do you think the chemical industry began to develop in Azerbaijan?	What are the economic opportunities and barriers in Azerbaijan for the non-oil industry, especially the chemicals and petrochemicals industries?
3.	How many enterprises and plants operate in your sector?	In order to take advantage of existing economic opportunities, is the state working to reduce technological differences and overtake already industrialized and developed countries? If not, why? If so, how?
4.	How would you evaluate the competitiveness of the chemicals industry in domestic and foreign markets (or in your specific subsector)?	In your opinion, did the non-oil sector de-industrialize after the oil boom in Azerbaijan? What factors accelerated this? Has the state fought against this?
5.	Do you think that the real effective exchange rate or the value of the national currency impacts the production and export performance of the chemical industry (or your specific subsector)?	Can SOCAR Polymer, SOCAR Carbamide, and sulphuric acid plants to be opened be considered a success for the chemical industry as well as the non-oil sector? If so, why? Why are high value-added sectors still under-invested?
6.	How do you assess labor supply in the chemical industry or in the field in which you operate? Is there enough qualified personnel to ensure quality production? What measures are being taken to prepare them? What kind of link is present between oil prices and the output of chemical subsectors?	What could be the cause of the slowdown or collapse of some chemical subsectors in the Azerbaijan economy, especially after 2005 and 2006 (for example, caustic soda, liquid soda, isopropyl alcohol, sulfuric acid, chlorine and hydrochloric acid)? Did oil play a role in this? Or do you think there are other economic and institutional reasons as well?
7.	Do you think that domestic and foreign investment is currently sufficient for the sustainable development and growth of the chemical industry?	Does the state have an industrial policy? What tools and measures are used? Are the ones used in accordance with the principles of the market economy? What can be expected for the future of this field if the ruling role of the state is taken away from the chemicals industry?
8.	Is there a link between oil prices and the output of the chemical industry? If	After the years of independence, was Azerbaijan's exchange rate policy

	so, how?	appropriate for non-oil industrialization? What measures should be taken to address the existing challenges and problems?
9.	What is the relation of your specific subsector to the oil industry?	Do you think that Azerbaijan will be able to industrialize and become less dependent on oil in the near future without a private sector or democratic participation in production, but only through the transfer of technology?
10.	What can impact the sustainabile levels of output in the chemicals subsectors?	
11.	What could be the reason for the slowdown or collapse of the subsectors such as chlorine, hydrochloric acid, sulphuric acid, caustic soda, liquid soda and isopropyl alcohol following years such as 2005 and 2006?	
12.	What is the reason for the successful output in your specific subsector? Or in the subsectors of barium sulphate, bitumen, ethylene, liquid air, nitrogen, oxygen, paint and lacquer materials, polyethilene, and propylene?	
13.	What kinds of challenges and problems are present in chemicals industry in general (or in your specific subsector)?	
14.	What has been the level of state support for the chemical industry in the last 15-16 years?	

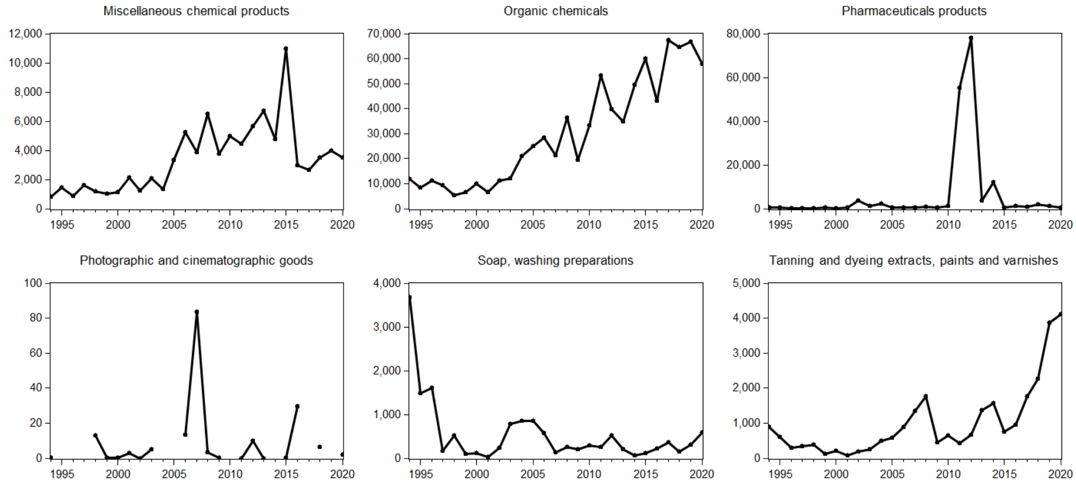
Source: The author’s own construction based on the interview questions.

Figure A5.10: Exports of chemical subsectors in the Azerbaijan economy, 1994–2020.



Source: SSCRA (2022).

Figure A5.11: Exports of chemical subsectors in the Azerbaijan economy, in thousand AZN 1994–2020.



Source: SSCRA (2022)