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Research Article

De-industrialization in Azerbaijan's Textile Subsectors: Canonical Correlation Analysis and the Dutch Disease Hypothesis

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Abstract

Since 2014, academic studies have increasingly underscored the potential adverse consequences associated with Azerbaijan's imbalanced and dependent economic structure. It is widely recognized that countries relying heavily on the export of primary commodities are ill-prepared for situations characterized by sharp declines in international commodity prices. Hence, the objective of this paper is to examine the Azerbaijani economy amidst two parallel developments: the growth of oil-related macroeconomic indicators and the contraction of non-oil subsectoral industrial production. To achieve this, the analytical framework of the Dutch disease, a widely preferred theory to study commodity exporters, and canonical correlation analysis (CCA) were employed in the period 1995 to 2021. The findings reveal statistically significant canonical correlations between certain subsectors of the textile industry (such as ginned cotton, cotton fabric, silk fabric, bed linen of cotton, and cotton yarn) and the Dutch disease variables (e.g., oil rent, real effective exchange rate), while other subsectors (including carpets, crocheted legwear and garments, outerwear, underwear, and footwear) do not exhibit similar patterns. These results show that non-consumer subsectors of the textile subsectors, especially the cotton sector, are more vulnerable to the effects of Dutch disease than consumer subsectors of the textile subsectors. In addition, the oil rent variable is a persistent channel that shows a negative correlation with the latent variables of the textile subsectors. These results prompt policymakers and researchers to reassess the role of large extractive industries in a small, open economy like Azerbaijan and to formulate economic policies that safeguard and foster specific subsectors.

Keywords: Azerbaijani economy, canonical correlation analysis (CCA), Dutch disease, oil sector, textile industry.

JEL Codes: C10, D24, L67, Q33

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Araştırma Makalesi

Azerbaycan'ın Tekstil Alt Sektörlerinde Sanayisizleşme: Kanonik Korelasyon Analizi ve Hollanda Hastalığı Hipotezi

İbrahim Niftiyev[a]

Öz

2014 'ten bu yana, akademik çalışmalar Azerbaycan'ın dengesiz ve bağımlı ekonomik yapısıyla ilişkili potansiyel olumsuz sonuçların altını giderek daha fazla çizmektedir. Büyük ölçüde birincil emtia ihracatına dayanan ülkelerin, uluslararası emtia fiyatlarında keskin düşüşlerle karakterize edilen durumlara karşı hazırlıksız olduğu yaygın olarak kabul edilmektedir. Dolayısıyla, bu çalışmanın amacı Azerbaycan ekonomisini iki paralel gelişme çerçevesinde incelemektir: petrolle ilgili makroekonomik göstergelerin büyümesi ve petrol dışı alt sektörel sanayi üretiminin daralması. Bunu başarmak için, emtia ihracatçılarını incelemek için yaygın olarak tercih edilen bir teori olan Hollanda hastalığının analitik çerçevesi ve kanonik korelasyon analizi (CCA) 1995 ve 2021 zaman aralığı için kullanılmıştır. Bulgular, tekstil endüstrisinin bazı alt sektörleri (çırçırlanmış pamuk, pamuklu kumaş, ipekli kumaş, pamuklu yatak çarşafları ve pamuk ipliği gibi) ile Hollanda hastalığı değişkenleri (örneğin, petrol rantı, reel efektif döviz kuru) arasında istatistiksel olarak anlamlı kanonik korelasyonlar ortaya koyarken, diğer alt sektörler (halılar, tığ işi bacak giysileri ve giysiler, dış giyim, iç giyim ve ayakkabılar dahil) benzer modeller sergilememektedir. Bu sonuçlar, tekstil alt sektörlerinin tüketici olmayan alt sektörlerinin, özellikle de pamuk sektörünün, tekstil alt sektörlerinin tüketici alt sektörlerine kıyasla Hollanda hastalığının etkilerine karşı daha kırılgan olduğunu göstermektedir. Ayrıca, petrol rantı değişkeni, tekstil alt sektörlerinin gizli değişkenleri ile negatif korelasyon gösteren sabit bir kanaldır. Bu sonuçlar, politika belirleyicilerini ve araştırmacılarını Azerbaycan gibi küçük ve açık bir ekonomide büyük maden çıkarma endüstrilerinin rolünü yeniden değerlendirmeye ve belirli alt sektörleri koruyan ve teşvik eden ekonomi politikaları oluşturmaya sevk etmektedir.

Anahtar Kelimeler Azerbaycan ekonomisi, Kanonik korelasyon analizi (KKA), Hollanda hastalığı, petrol sektörü, tekstil endüstrisi

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Introduction

Azerbaijan is a country in the South Caucasus with a booming economy and a coastline on the Caspian Sea. Although the country has a population of only about 10 million, its economy depends heavily on the export of natural resources such as oil and gas (Ibadoghlu et al., 2013). Some authors have even claimed that Azerbaijan is the most oil-dependent country among post-Soviet countries due to its low industrial diversification (Czech, 2018a). This leads to various problems such as resource dependence (Sadik-Zada, 2021), de-industrialization (Sadik-Zada et al., 2019a), Dutch disease (Hasanov, 2013), and unsustainable public finances (Sadik-Zada et al., 2019b). Nonetheless, Azerbaijan has experienced tremendous economic growth and development due to its high share of extractive industries, with some emphasis on diversifying the economy away from its historical dependence on the oil industry. The government has aggressively sought to attract foreign investment into the country and has initiated a number of economic changes, including privatization and liberalization initiatives (Aras et al., 2016). However, the share of sectors such as agriculture in total value added is low (Czech, 2018b), and some subsectors are unable to gain competitive advantages to contribute to the national economy. The country's economy faces a number of threats, including heavy dependence on oil and gas exports, which makes the country vulnerable to external shocks. The problem of unemployment and economic inequality persists.

Small economies that are heavily dependent on single industry, such as oil, often face challenges related to national income diversification and thus long-term sustainable economic growth and development (Badeeb et al., 2017). Textile production is a labor-intensive industry that has the potential to create jobs and promote economic growth (Edmonds et al., 2019). By analyzing the textile industry in an oil-rich and small economy like Azerbaijan, we can better understand the opportunities and challenges of diversification and identify potential solutions to promote sustainable economic development. In addition, studying the textile industry in a small economy could shed light on the competitiveness of the industry and how it can remain export-oriented in the global market. Therefore, a comprehensive analysis of the textile industry in an oil-rich and small economy can provide valuable information for policy makers, investors, and researchers interested in economic development, diversification, and competitiveness.

Due to the potential of promising cotton production and strengthened international ties, Azerbaijan is considered to have a good capacity for the textile industry, even though the country experienced de-industrialization of its textile industry in the post-Soviet years (Rashed & Ahmadov, 2019; Niftiyev, 2022). Recent collaborations with international partners also suggest that some subsectors of the textile industry may be entering a new phase of development. For example, in April 2023, the Azerkhalcha Open Joint-Stock Company and the World Bank Group financial institutions reviewed possible areas of cooperation to promote carpet weaving (Report News Agency, 2023). Despite some optimistic aspects said about the carpet industry (Hajiyeva, 2019), this sector, as one of the most important subsectors of the textile industry, also has some controversial features. According to Safarova (2019), the state has heavily regulated the carpet industry, which has resulted in a lack of small workshops in the regions that hurts individual carpet producers. In addition, there have been several corruption cases in the carpet industry, with the former board chairman of Azerkhalcha accused of embezzling more than 21.6 million manats ($12.7 million). Overall, these facts suggest that the textile industry in Azerbaijan is far from perfect in its organization of production and that this could be related to phenomena such as Dutch disease or the theory of the curse of natural

resources. For this reason, the methodological study of the Dutch disease in relation to a specific non-oil sector in a small and open economy like Azerbaijan could be fruitful and shed light on the unseen economic aspects of industrial production in the last 30 years of independence.

Dutch disease refers to an economic phenomenon where a country's overreliance on a booming natural resource sector, such as oil or minerals, leads to negative consequences for other sectors of the economy (Corden & Neary, 1982; Corden, 1984). As revenues from the resource sector increase, the local currency appreciates, making non-resource exports less competitive and potentially causing their decline (Corden & Neary, 1982; Corden, 1984). This shift can result in a de-industrialization effect, where manufacturing and other non-resource industries suffer (Corden & Neary, 1982; Corden, 1984). Dutch disease can hinder economic diversification, create vulnerability to commodity price fluctuations, and impede long-term sustainable development (Torvik, 2001).

The additional motivation for this work is that canonical correlation analysis (CCA) has not been applied to specific subsectoral data in the case of the Azerbaijani economy, which relates to the impact of Dutch disease, a very popular method of analyzing structural change in a manufacturing industry for small open economies. In other words, some effects of Dutch disease are assumed to lead to crowding out of the non-oil industry due to rising production costs, appreciation of the real effective exchange rate (REER), and rent-seeking behavior. As we can see from these statements, all these variables can have a cumulative effect on certain non-booming subsectors. These are the non-oil manufacturing sectors in Azerbaijan. So far, the vegetable sector and the chemical sector have been analyzed in terms of the impact of diseases in the Azerbaijani case (Niftiyev & Czech, 2021; Niftiyev, 2022a). However, this work aims to analyze the textile industry and its subsectors in relation to the Dutch disease hypothesis.

The primary research question addressed in this paper is whether there is a canonical correlation between the macroeconomic variables associated with Dutch disease and the negative impact on specific subsectors of the textile subsectors in Azerbaijan during the period from 1995 to 2021. The aim of this study is to reveal the underlying correlations between two different groups (or sets) of variables: first, the specific textile subsectors, including carpet, footwear, cotton yarn, silk fabric, etc.; and second, the relevant Dutch disease variables such as oil rents, REER, and consumer price index (CPI). The main objective of this research is to uncover the canonical correlation between these two groups of variables by applying CCA. The application of this selected empirical methodology along with the examination of case studies within specific subsectors contributes to the literature by providing new insights since, to the best of the author's knowledge, no previous studies of this type have been identified.

By applying an in-depth sector- and country-specific perspective to Dutch disease theory, this paper can fill a research gap in the existing literature. Typically, Dutch disease has been analyzed at a highly aggregated macroeconomic level, e.g., using the three-sector model of Corden (1982) and Corden and Neary (1984) in the case of Azerbaijan. However, CCA addresses a practical problem and contributes to theory by testing the Dutch disease model in an oil-rich economy. Therefore, this work is a continuation of an emerging trend in subsectoral analysis of theory in the case of Azerbaijan. While CCA is not an advanced technique and not the most perfect empirical method to test the presence of signs and effects of Dutch disease, it sheds efficient light on the underlying patterns between certain non-oil manufacturing subsectors and variables associated with Dutch disease.

The structure of this paper is as follows: Section 2 presents the data and methodology employed in the research. Section 3 presents the findings derived from the CCA. Section 4

provides a comprehensive discussion and draws relevant conclusions regarding the current economic landscape and future prospects of the textile industry in Azerbaijan.

Data and Methodology

This study used CCA, a statistical technique, to analyze the relationship between two groups of variables (Marcos et al., 2018). The goal of CCA is to identify the linear combinations of variables in each group that have the highest correlation with each other (Zhang et al., 2021). In other words, CCA helps to identify the underlying patterns of association between the two sets of variables and can be a productive method in the case of understudied domains (Andrew et al., 2013). This is mainly done by creating canonical variables. The canonical variables can be interpreted as latent variables or dimensions that summarize the underlying relationships between the variables in each set. They provide information about how the sets of variables are related to each other and can be used to examine common (or shared) variance and associations between variables.

CCA is commonly used in fields such as psychology, sociology, and economics, where researchers are interested in understanding the relationship between different groups of variables (Abdulazeez & Gulumbe, 2013). It can be used to study the relationship between two groups of continuous variables or between a group of continuous variables and a group of categorical variables. CCA is also commonly used in data reduction and variable selection because it can help identify the most important variables in each set that drive the correlation. In the case of this study, CCA was applied to the subsectoral data (referred to as Set 1 in this study) collected by the State Statistical Committee of the Republic of Azerbaijan (SSCRA) between 1995 and 2021. By utilizing CCA, the research aims to reveal the significant variables driving correlations within this dataset, shedding light on the interrelationships and potential patterns within the subsectors over the specified time frame. The numerous economic subsectors and the various macroeconomic variables associated with Dutch disease may interact in a variety of ways. This complicates the analysis procedure, but CCA makes it possible to automate the procedure in a time-saving manner. In other words, instead of analyzing multiple subsectors separately, CCA allows you to observe whether the assumed expectations are true or not, saving time and energy. Therefore, the Azerbaijani economy provides a natural case study to combine CCA and Dutch disease theory to clarify these expectations.

The data for the subsectors were collected in their natural volume. For example, thosuand tonds, pairs, untis, etc. Next, the dataset contained three variables of interest, for example, oil price, REER, and CPI between 1995 and 2021 (Set 2). The variables in Set 2 are typical variables commonly used in Dutch disease studies, including for the Azerbaijani economy. Sources for the Dutch disease variables were the World Bank (oil rents), Bruegel datasets (REER), and the International Monetary Fund (CPI). Table 1 lists all variables of interest, their descriptive statistics, and relevant information about them.

Table 1
Descriptive statistics of the variables of interest and their measurement units.

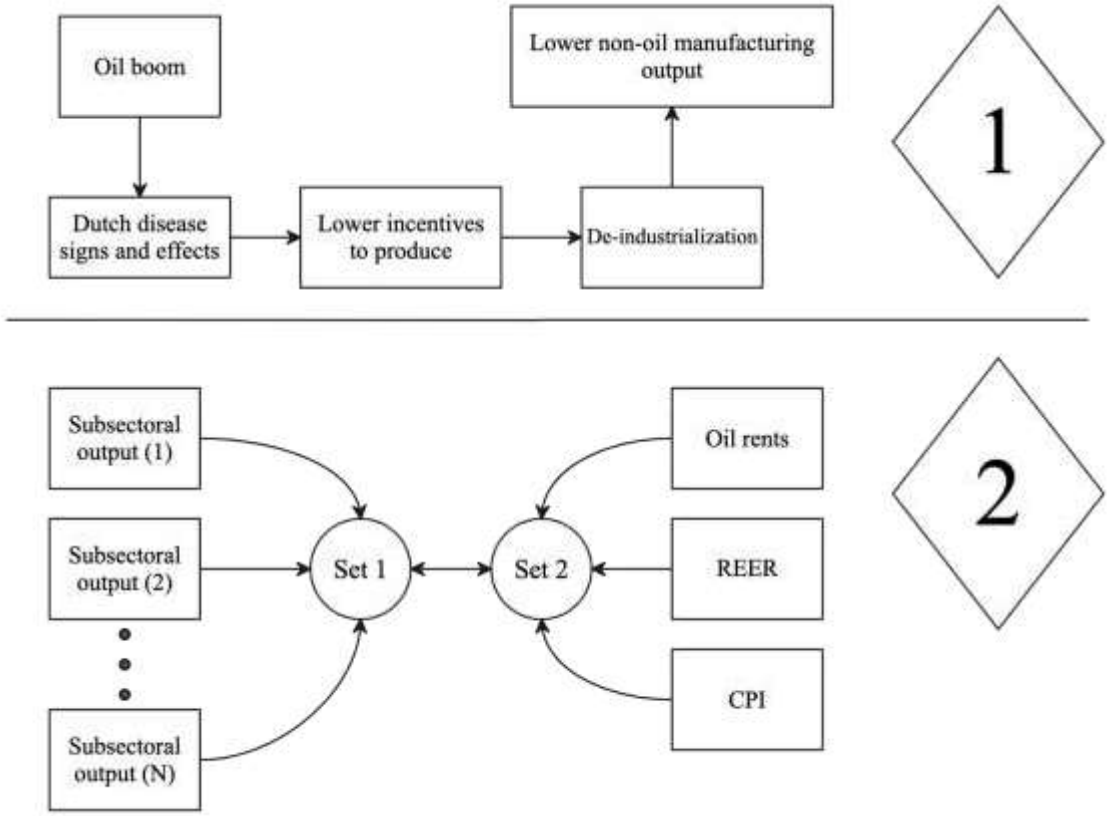
Variable name	Measurement	Min	Max	Mean	St.Dev.
Set 1					
Ginned cotton	Thsd. tons	6.6	98.5	41.6	26.6
Cotton fabric	Thsd. sq. m	253.6	57,908.0	9,897.8	13,798.9
Silk fabric	Thsd. sq. m	7.8	801.0	347.6	243.1
Bed linen of cotton	Thsd. units	31.9	1325.1	340.4	254.3
Cotton yarn	Thsd. tons	0.7	34.8	11.1	8.6
Carpet	Thsd. sq. m	0.2	630.0	66.3	142.8
Crocheted legwear and garments	Thsd. pairs	683.7	8,260.0	2,658.1	1,597.7
Outerwear	Thsd. units	51.4	2653.0	533.4	536.0
Underwear	Thsd. units	128.3	2,934.0	588.8	530.8
Footwear	Thsd. pairs	54.0	1214.0	364.9	249.4
Set 2					
Oil rents		3.7	39.7	23.3	8.8
REER	in %	72.1	140.6	100.0	20.3
CPI		42.6	171.9	91.9	41.8

Note. Set 1 data was collected by the State Statistical Committee of the Republic of Azerbaijan (SSCRA) between 1995 and 2021.Set 2 data was extracted from World Bank (oil rents), Bruegel datasets (REER), and the International Monetary Fund (CPI). REER denotes real effective exchange rate; CPI denotes consumer price index.

By and large, the dataset did not contain missing values, but only the silk fabric among the textile subsector data had missing values. They were for the years 2000 and 2020. There was also a missing value for oil rents for the year 2021. In total, there were only three missing values predicted using linear interpolation or the TREND function in the Microsoft Excel software. Finally, CCA procedure was conducted via IBM SPSS Statistics software (version 23).

This study uses the original theory of Dutch disease developed by Coden and Neady (1982) and Corden (1984) to design an analytic research framework. Figure 1, the first upper panel, describes the theoretical framework and shows that an oil boom leads to signs and effects of Dutch disease according to the original Dutch disease theory of Corden and Neary (1982) and Corden (1984). This reduces the competitiveness of domestic producers on international markets. This is the reason why domestic producers of non-booming tradeable sectors have lower economic incentives to produce during resource booms. This ultimately leads to a decline in non-oil manufacturing production. In the case of the Azerbaijani economy, the textile industry is a good candidate for evaluation, but to date it has not been studied in English-language publications using a quantitative methodology. For this reason, the CCA procedure assumes two sets of variables: Set 1, in which the specific subsectors of the textile industry are included; and Set 2, in which three important variables, namely oil rents, REER, and CPI, are correlated (see the second bottom part of Figure 1). By combining the Dutch disease hypothesis and CCA, this research design improves our understanding of de-industrialization as a negative consequence of the natural resource boom.

Figure 1
Theoretical framework and expected relationship among the variables of interest.



Source. Created by the author.
Note. REER denotes real effective exchange rate; CPI denotes consumer price index

Results

The first step of CCA was to estimate the general canonical correlations shown in Table 2 for subsectors such as ginned cotton, cotton fabric, silk fabric, bed linen of cotton, and cotton yarn. Only the first two canonical models were statistically significant, with eigenvalues of 2.57 and 1.93, respectively, so the third canonical model was ignored in further analysis.

In short, since the Wilks statistic measures the significance of the overall relationship between the analyzed groups of variables, we can conclude that the joint significance of all canonical correlations in the analysis is very high for the first model (0.072 and 0.000 statistical significance). The second model, on the other hand, provides moderate joint significance for the canonical correlations (0.258 and 0.001 statistical significance). In addition, the first canonical model fits the data better than the second and explains most of the variation in the selected subsectors of the textile industry. Finally, based on the number of degrees of freedom, the F-statistic is calculated for each canonical model, and the highest value belongs to the first model (5.303).

Table 2
Canonical correlations of the selected textile subsectors (ginned cotton, cotton fabric, silk fabric, bed linen of cotton, and cotton yarn) and Dutch disease-related variables.

	Correlation	Eigenvalue	Wilks' Statistic	F	Num D.F	Denom D.F.	Sig.
1	0.848	2.567	0.072	5.303	15	50.091	0.000
2	0.811	1.925	0.258	4.595	8	38	0.001
3	0.494	0.323	0.756	2.155	3	20	0.125

Note. H0 for Wilks test is that the correlations in the current and following rows are zero; "D.F." denotes degrees of freedom; "Sig." denotes significance.

Table 3 shows the standardized and unstandardized canonical coefficients of Set 1. The first canonical variable is positively associated with cotton fabric (0.735), bed linen of cotton (0.248), and cotton yarn (0.445). However, ginned cotton and silk fabric are negatively associated with the first canonical variable (–0.544 and –0.636, respectively). The number of negative correlations increases to 3 for the second canonical variable in Table 3, which means that bed linen of cotton is also negatively correlated with the canonical variable (–0.478). The unstandardized canonical coefficients are not as meaningful as the standardized canonical coefficients, although some subsectors such as ginned cotton, silk fabric, and bed linen of cotton maintain their negative correlations.

Table 3
Standardized and unstandardized canonical coefficients of Set 1.

	Standardized		Unstandardized	
Variable	**1**	**2**	**1**	**2**
Ginned cotton	–0.544	–1.190	–0.022	–0.048
Cotton fabric	0.735	0.167	0.000	0.000
Silk fabric	–0.636	–0.086	–0.003	0.000
Bed linen of cotton	0.248	–0.478	0.001	–0.002
Cotton yarn	0.445	0.942	0.053	0.111

Table 4 shows the canonical loadings and cross-loadings of Set 1. Cotton yarn (0.680), bed linen of cotton (0.552), and cotton fabric (0.552) loaded strongly on the first canonical variable (or, in other words, they were strongly and positively correlated with the first canonical variable), while silk fabric loaded negatively but strongly on the first canonical variable (–0.605). Ginned cotton had a moderate effect on the first canonical variable (0.431). However, for the second canonical variable, we see that ginned cotton is strongly but negatively correlated (–0.643), while bed linen of cotton is negatively and weakly correlated (–0.063). Cotton yarn (0.298) maintained its sign of the coefficient, i.e., it remained positive, but in the case of the second model, its strength decreased significantly. Finally, both cotton and silk fabric changed their signs of correlation coefficients and lost their correlation strength when the second canonical variable was formed to explain the selected subsectors.

Table 4 also shows the canonical cross-loadings. In this case, the cross-loadings explain how each subsector is correlated with the corresponding canonical variable of Set 2. Set 2 in this study includes variables related to Dutch diseases. Therefore, silk fabric has a moderately negative cross-loading or correlation (–0.513) with the first canonical variable of Set 2, while all other subsectors are positively correlated (e.g., ginned cotton, 0.365). The picture changes when the second canonical variable of Set 2 is included in the analysis. More specifically,

ginned cotton (–0.522), cotton fabric (–0.244), and bed linen of cotton (–0.063) are negatively correlated with the second canonical variable of set 2, while silk fabric is positively correlated (0.309), in contrast to the previous scenario. Only cotton yarn maintains its positive correlation, but its strength decreases from 0.577 to 0.242.

Table 4
Canonical loadings and cross-loadings of Set 1.

	Canonical loadings		Canonical cross loadings	
Variable	**1**	**2**	**1**	**2**
Ginned cotton	0.431	–0.643	0.365	–0.522
Cotton fabric	0.552	–0.301	0.468	–0.244
Silk fabric	–0.605	0.380	–0.513	0.309
Bed linen of cotton	0.569	–0.077	0.482	–0.063
Cotton yarn	0.680	0.298	0.577	0.242

For the second group of variables, which includes the REER, oil rents, and CPI, Table 5 shows a similar picture in terms of the distribution of standardized and unstandardized canonical coefficients. While CPI has the highest standardized correlation coefficients with the first and second canonical variables (0.915 and 0.330, respectively), REER has a very high standardized correlation with the second canonical variable (0.805), but interestingly, this relationship with the first canonical variable is moderately negative (–0.686). Oil rents have a moderate correlation (–0.404) and a weak negative correlation (–0.056) with the first and second canonical variables. The unstandardized canonical coefficients of Set 2 show a similar picture in terms of signs.

Table 5
Standardized and unstandardized canonical coefficients of Set 2.

	Standardized		Unstandardized	
Variable	**1**	**2**	**1**	**2**
REER	–0.686	0.805	–0.033	0.039
Oil rents	–0.404	–0.056	–0.046	–0.006
CPI	0.915	0.330	0.023	0.008

Note. REER denotes real effective exchange rate; CPI denotes consumer price index.

The canonical loadings are high and positive for CPI (0.632 and 0.707, respectively), while the oil rents load negatively on both canonical variables (–0.539 and –0.016, respectively). The REER has a negative effect on the first canonical variable (–0.296) but a positive and very strong correlation with the second canonical variable (0.952, see Table 6). In this case, the second canonical variable shows a better picture of how oil-related or Dutch disease-related variables could have a combinatorial impact on a particular subsector of the textile subsector. A look at the cross-loadings from Table 6 also shows that REER is positively and strongly correlated with the second canonical variable, namely textile production in the subsector (0.773). However, with the first canonical variable from Set 1 (–0.251), this relationship is negative and rather weak. Interestingly, CPI maintains its moderate and positive correlation with both canonical variables of the textile subsector (0.536 and 0.573). Meanwhile, oil rent shows a negative and moderate correlation only with the first canonical variable (–0.458).

Table 6
Canonical loadings and cross-loadings of Set 2.

Variable	1	2	1	2
REER	–0.296	0.952	–0.251	0.773
Oil rents	–0.539	–0.016	–0.458	–0.013
CPI	0.632	0.707	0.536	0.573

Note. REER denotes real effective exchange rate; CPI denotes consumer price index.

Because Set 1 contained data on textile production in the subsectors, it was assumed to depend on the explanatory Dutch disease-related variables in Set 2. The focus must therefore be on the extent to which Set 1 can be explained by Set 2. The CCA provides such information, and Table 7 shows that Set 1 can be explained by the first and second canonical variables of Set 2 at 0.236 and 0.098, respectively. This has a rather weak explanatory power, but it still has some explanatory power and is consistent with the main expectations of the theoretical considerations.

Table 7
Proportions of variance explained.

Canonical Variable	Set 1 by Self	Set 1 by Set 2	Set 2 by Self	Set 2 by Set 1
1	0.328	0.236	0.260	0.187
2	0.149	0.098	0.469	0.309

Finally, Table 8 shows that none of the canonical correlations were statistically significant for the production data of subsectors such as carpets, crocheted legwear and garments, outerwear, underwear, and footwear. This shows that the possible correlation between the above subsectors and the typical Dutch disease variables is weak or even nonexistent. For this reason, further analyses of specific canonical variables, variates, loadings, cross-loadings, and proportions of the explained variance of CCA were not included in this part.

Table 8
Canonical correlations of the selected textile subsectors (carpet, crocheted legwear and garments, outerwear, and underwear and footwear) and Dutch disease-related variables.

	Correlation	Eigenvalue	Wilks Statistic	F	Num D.F	Denom D.F.	Sig.
1	0.633	0.670	0.396	1.332	15	50.091	0.219
2	0.532	0.394	0.661	1.092	8	38	0.390
3	0.280	0.085	0.922	0.565	3	20	0.644

Conclusions

In this paper, the subsectoral textile production of the Azerbaijani economy was studied in comparison with some selected key variables of the Dutch disease hypothesis. There is a great lack of agreement on the prevalence of Dutch disease at the subsector level in the Azerbaijani economy. This means that while many papers analyzed aggregate and general correlations, few or almost none of them focused on specific manufacturing subsectors outside of extractive industries. By using CCA and Dutch disease theory, this paper contributes to the literature on the Azerbaijani economy by highlighting ten subsectors of the textile subsectors.

In general, the results show that consumer-oriented textile products such as carpets, crocheted legwear and garments, outerwear, underwear, and footwear are not statistically significantly associated with Dutch disease-related macroeconomic variables. CCA did not provide meaningful results for them. There may be many reasons for this. For example, perhaps consumer-oriented textile products were not really well developed during the years of the Soviet Union and the early 1990s, so the oil boom that peaked in 2011 did not have much impact on them. Moreover, the Azerbaijani economy, although small, still has effective domestic demand, which may have necessitated the production of the above subsectors to some extent, even using imported inputs. However, non-consumer-oriented cotton, cotton fabric, silk fabric, and cotton yarn (including bed linen of cotton) are statistically significantly associated with Dutch disease-related macroeconomic variables in Azerbaijan. The study period was between 1995 and 2021, and the Dutch disease-related variables were assumed to be oil rents, REER, and CPI.

More specifically, in the case of the first canonical model, ginned cotton, cotton yarn, bed linen of cotton, and cotton fabric had similar trends in relation to the first canonical variable (with the exception of silk fabric). This also meant that the above subsectors had positive correlations with the first canonical variable of Set 2. Put differently, in the case of the first canonical model for the specific textile subsectors, we can only observe a single negative correlation with the Dutch disease variables (Set 2) which was silk fabric. However, in the case of the second canonical model for the subsectors, ginned cotton, cotton fabric, and bed linen of cotton were negatively correlated with the second canonical variable of Set 1 and negatively correlated with the Dutch disease variables. Cotton yarn never showed negative correlations.

CPI and REER had high and positive correlations with the second canonical variable of Set 2. This resulted in the second canonical variable of Set 2 being better able to explain the impact of Dutch disease on the subsectors of the textile subsectors. For this reason, the negative correlations between ginned cotton, cotton fabric, bed linen of cotton and Dutch disease are of particular interest. Interestingly, CPI was positively correlated with both the first and second canonical variables of Set 1 and Set 2 (this is understandable because consumer-oriented textile production as a whole was not statistically significantly correlated with the Dutch disease variables), but oil rents were negatively correlated with both canonical variables of Set 1 (–0.458 and –0.013, respectively). Thus, we can conclude that oil rents are a more consistent channel for affecting textile production in specific subsectors than REER and that CPI does not have negative correlations with production in subsectors.

These results are consistent with those of Niftiyev (2021), Niftiyev and Czech (2020), and Niftiyev (2022b), who found a clear relationship between subsectors vegetable and chemical subsectors and their susceptibility to Dutch disease and related phenomena in the context of the dynamics of the oil boom in Azerbaijan. Although it is important to emphasize that this study is a correlational design and causal conclusions should be drawn with caution, it is still possible to note agreement with the findings of Hasanov (2013) and Hasanov and Samadova (2010). These previous scientific works have conclusively documented the discernible effects of REER, oil prices, and CPI on non-oil production or GDP. Consequently, this study argues from the reasonable premise that the Dutch disease phenomenon can be analytically uncovered through careful empirical modeling and modern methods, especially CCA. However, it remains noteworthy that comprehensive subsectoral studies illuminating the impact of Dutch disease within the Azerbaijani economic paradigm are still conspicuously underrepresented.

To strengthen textile subsectors in a small developing country like Azerbaijan while mitigating the impact of Dutch disease, policymakers can implement a combination of targeted

policies (Sadik-Zada, 2016). Inspired by the Asian Development Bank's (2023) recommendations for Uzbekistan's manufacturing sector, particularly the textile and garment industry, the main policy implications of this study are as follows: Firstly, investing in technology and innovation within the textile industry can enhance productivity and competitiveness, allowing the country to produce higher-value textile products. Secondly, fostering skill development programs and vocational training initiatives can enhance the human capital in the industry, enabling the workforce to adapt to changing market demands. However, vocational education and training is currently quite problematic in Azerbaijan. Additionally, promoting value chain integration and diversification, such as encouraging backward linkages with local cotton producers or forward linkages with fashion designers, can enhance the overall competitiveness and resilience of the textile subsectors. Furthermore, implementing supportive policies such as tax incentives, export promotion, and access to affordable financing can attract investments and stimulate export-oriented growth in the sector. By adopting a comprehensive approach that addresses technology, human capital, value chain integration, and supportive policies, Azerbaijan can foster a dynamic and sustainable textile industry while mitigating the negative impacts of Dutch disease.

In this regard, business liberalization plays a crucial role in fostering the growth and development of industries, including the textile sector. By removing unnecessary regulatory barriers and reducing bureaucratic hurdles, business liberalization enables entrepreneurs and investors to establish and operate textile businesses more efficiently and effectively. By embracing business liberalization, the small and developing country can unlock the potential of its textile sector, drive economic growth, generate employment opportunities, and enhance its competitiveness in the global market.

Although subsectors such as carpets, crocheted legwear and garments, outerwear, underwear, and footwear are not statistically significantly correlated with Dutch disease variables, their production collapse may be related to the indirect consequences of the oil boom in the Azerbaijani economy. Their case should be treated carefully and exclusively in future studies. Also, in the other subsectors, such as ginned cotton, cotton fabric, silk fabric, bed linen of cotton, and cotton yarn, where statistically significant canonical correlations were found and theoretically reasonable interpretations were drawn, some correlations were weak and unstable. All of this points to the limitations of the current study and CCA in general and invites the use of more advanced quantitative and qualitative research methods in addition to the results of this study.

Azerbaijan had moderate textile production during the years of the Soviet Union. Agriculture and related sectors can jointly participate in textile value creation in Azerbaijan. We should not forget that the opportunities for diversification of the country's one-sided industrial production are very limited. Due to limited resources and problematic human capital policies, it is unlikely that the textile industry will be able to solve this problem on its own. Nevertheless, the textile industry can be a good source of jobs, an acceptable solution to the problem of oil dependence, and ensure participation in regional and global value chains. Hopefully, the government will take this sector more seriously and implement reforms that will encourage the private sector to overcome the structural problems related to the Dutch disease, which have significantly affected the non-oil manufacturing sector since 2005 and 2006. Otherwise, this sector will operate below its potential capacity, be corrupt and inefficient for the national economy.

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