

An Examination of the Causality Between Export, Import and Economic Growth of Kosovo Using Quarterly Data From 2010 To 2021

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ABSTRACT

The aim of this paper is to examine the nexus between exports, imports, and economic growth for the Kosovo's economy in the period 2010-2021. Unit root tests were used to test the stationarity condition. The ADF, P-P and KPSS tests showed that the three variables are stationary in the first difference. The Johansen cointegration test showed that these variables are cointegrated in the short run. The lag length was set to five based on three criteria. The proposed model was free of serial autocorrelation and heteroskedasticity. Granger causality results based on Vector Autoregression showed that there is a bidirectional causality relationship between exports and economic growth. There is no causality between imports and economic growth. However, there is unidirectional causality from economic growth to imports and unidirectional causality from exports to imports. This study supports the ELG theory, i.e., exports are an important driver of economic growth.

Keywords: exports, imports, economic growth

Introduction

The relationship between exports and imports and their impact on a country's economic success is a hot topic for economists, policymakers, and to some extent, academics as economic growth is considered the best indicator of a country's well-being or economic prosperity (Khan & Khan, 2021). The past two decades have seen tremendous trade integration and expansion, as well as a changing global trade environment (Sokolov-Mladenović et al., 2016). One of the concerns of how a country can achieve economic development is the export-led hypothesis which states that exports are critical to promoting economic growth (Jordaan & Eita, 2007). For decades, researchers have been interested only in the role of exports in spurring economic growth. According to proponents of the export-led growth (ELG) hypothesis, exports contribute positively to economic growth by facilitating the exploitation of economies of scale, especially in small economies; removing the binding constraint to increase import of capital and intermediate goods; increasing efficiency through increased competition; and promoting the diffusion of technical know-how through learning by doing (Mahadevan & Suardi, 2008).

Nevertheless, in addition to exports, the significance of import movements in the development of wealth and national prosperity is also recognized (Bakari et al., 2019). The relationship between exports, imports, and economic growth (as measured by GDP-Gross Domestic Product) occupies a prominent position in the economic development literature and it is a major policy concern for government planners and policymakers. To this end, it is particularly interesting to know the direction of causality between these variables (El Alaoui, 2015).

This paper provides new insights into the economic situation in Kosovo by analyzing the causal relationship between exports, imports, and economic growth using quarterly data from 2010:Q1 to 2021:Q3. It is one of the first studies to examine the relationship between these variables for Kosovo using actual data and a significant number of observations. With the exception of the study of Vardari (2016), who analyzed this relationship using annual data from 2004 to 2014, a total of 10 observations, no other study has been conducted. Moreover, this paper uses data from the Covid-19 pandemic period, which had a fundamental impact on the economies of each country. This paper is organized as follows: First, we review the literature on key variables and then discuss the economic and trade situation in Kosovo. Then, using the time series data, we empirically examine the causality between the variables.

Literature Review

For many countries, the relationship between these three variables has been extensively studied. Researchers' findings are divergent. Awokuse (2007) examined the effects of exports and imports on economic growth in Bulgaria, the Czech Republic, and Poland. In the case of Bulgaria, the results showed empirical evidence for both export-led growth and growth-led exports. In the Czech Republic, there was Granger causality between exports and imports and economic growth, providing empirical evidence for both export- and import-led growth. Polish data, on the other hand, supported only import-led growth. Taghavi et al. (2012) studied the relationship between imports, exports and economic growth in Iran using the VAR method. According to their results, exports had a positive relationship with economic growth, while imports had a negative relationship with economic growth. El Alaoui (2015) examined the relationship between exports, imports, and economic growth using annual time series data for the Moroccan economy for the period 1980-2013 using the VECM. Granger causality results suggested bidirectional causality between economic growth and imports, unidirectional causality running from exports to imports, and no-directional causality between economic growth and export. Kogid et al. (2011) examined only the effect of imports on economic growth in Malaysia using data from 1970 to 2007, and they found bilateral causality between economic growth and imports.

Bakari (2017) investigated the relationship between exports, imports and economic growth in Tunisia exploiting annual time series data for the period 1965-2016 using a cointegration test and VECM. He argued that there is a bidirectional causal relationship between exports and economic growth in the short run. There is also a unidirectional causal relationship from imports to economic growth and a unidirectional causal relationship from exports to imports. However, in the long run, exports have a negative effect on economic growth, while imports have a positive effect on economic growth. There is a unidirectional causal relationship running from economic growth and a unidirectional causal relationship from imports to exports. In another paper, Bakari et al. (2019) studied the relationship between domestic investment, exports, imports, and economic growth for the Brazilian economy for the period 1970-2017 using the VECM method. They found that in the short run, imports, exports, and domestic investment condition economic growth, and economic growth conditions exports. Nevertheless, in the long run, imports have a negative effect on economic growth. Economic growth, exports, and domestic investment have no effect on imports, and economic growth, domestic investment and imports have no effect on exports. In a Hsiao version of the Granger causality and Toda-Yamamoto approach, Kogid et al. (2011) reported a bidirectional causal relationship between imports and economic growth in the short run where imports affect economic growth.

Using quarterly time series data from 2005 to 2014, Hashim and Masih (2014) found a bidirectional causal relationship between exports and economic growth in Malaysia, where exports lead to economic growth and economic growth lead to exports. At the same time, they confirmed a bidirectional relationship between imports and economic growth. Finally, they found a bidirectional causal relationship between exports and imports.

Okyere and Jilu (2020) found for Ghana that exports cause GDP, but GDP does not cause exports. Moreover, imports do not cause GDP and GDP does not cause imports. Devkota (2019) found long-run equilibrium relationships between exports, imports, and economic growth for India. They reported unidirectional causality leading from GDP to imports and unidirectional causality leading from exports to imports. Khan and Khan (2021) found a unidirectional causal effect from imports to GDP and a unidirectional causality from exports to GDP for Oman, while GDP had no causal influence on exports or imports. Millia et al. (2021) used the ARDL model to show that exports and imports have a positive effect on economic growth. Finally, fewer studies, such as that of Ali et al. (2021), found no causal relationship between exports, imports, capital, and economic growth in Bahrain using data from 1986 to 2018.

An Overview on the Economic Situation in Kosovo

According to the Kosovo Agency of Statistics, the population of Kosovo in 2020 is estimated at 1,798,188 people. In 2011 (the last time the population was recorded), the average age was estimated at 30.2 years. The average net salary for 2020 was €416. Exports of goods amounted to €474.8 million in 2020. Imports of goods amounted €3.2 billion in 2020. Inflation (Consumer Price Index) was 0.2% in 2020. GDP for 2019 was €7,056,172. GDP per capita for 2019 was €3,959. Real GDP growth in 2019 was 4.8% (ASK, 2021).

The main economic indicator in the system of national accounts is Gross Domestic Product (GDP), which represents the performance of a country's economy over a given period. The Gross Domestic Product (GDP) in Kosovo is compiled on an annual basis, based on the approach of expenditure and production (economic activities) at prices of the current year and the previous year, and on a quarterly basis, based on the approach of expenditure and production (economic activities) at prices of the current year and the previous year (ASK, 2021). Economic activity has been

defined as recovering in 2021 due to the ease of containment measures to maintain public health. According to KAS calculations, real GDP increased by 12.1 percent from September 2021 to September 2022, with only a 14.5 percent increase in the third quarter of 2021. Net exports contributed 12.8 percentage points to real GDP growth in the third quarter of 2021, while consumption and investments contributed 1.7 and 0.1 percentage points, respectively (BQK, 2021A).

According to Kosovo Agency of Statistics, the sector with the highest GDP growth in the third quarter of 2021 was hotels and restaurants (95.5 percent), transport and storage (33.3 percent), trade (29.1 percent), and so on. In contrast, there was a 24.7 percent decline in energy supply and a 4.1 percent decline in construction (BQK, 2021A).

According to estimates by the Central Bank of the Republic of Kosovo, the accelerated upward trend in economic activity has continued in the fourth quarter of 2021. These estimates are based on direct or indirect measurements, which indicate an increase in exports of goods and services during the period, as well as an increase in remittances, foreign direct investment, etc. On the other hand, the significant increase in imports of goods and services contributed negatively to the growth rate of real GDP during the period under review (BQK, 2021A).

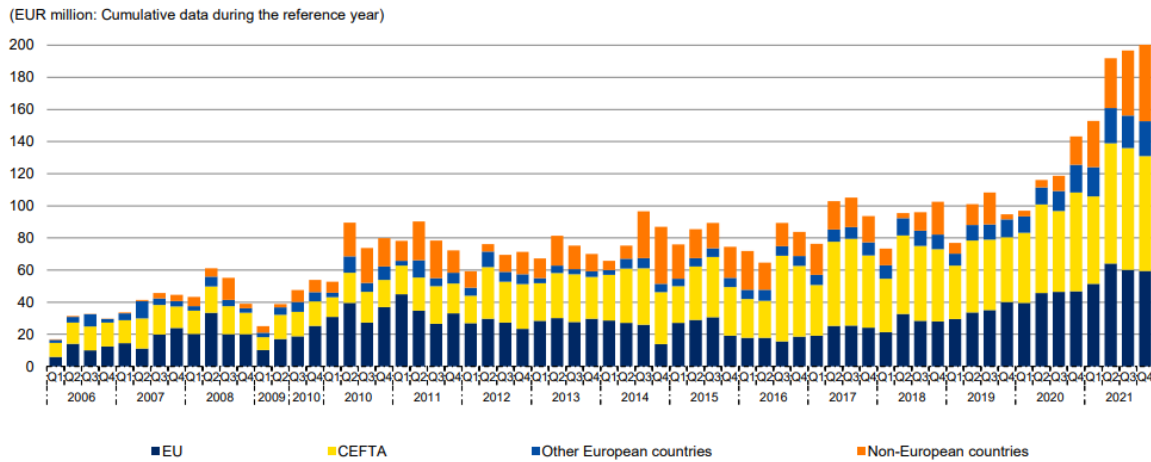


Figure 1. Exports of goods in Kosovo

Source: BQK (2021B)

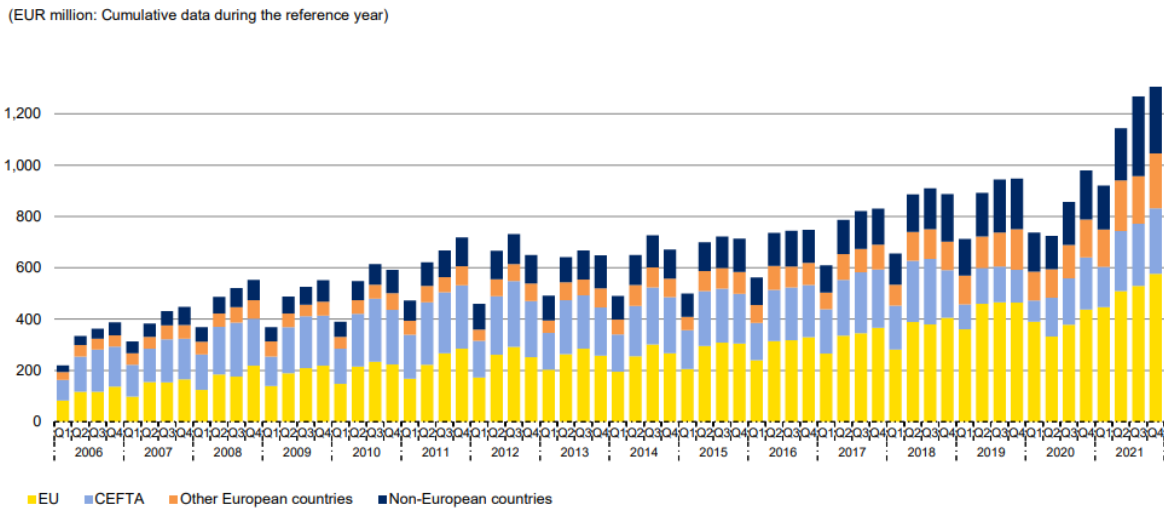


Figure 2. Imports of goods in Kosovo

Source: BQK (2021B)

Figure 1 summarizes Kosovo's exports from 2006 to the last quarter of 2021. Kosovo exports more goods to EU and CEFTA countries and less to other European and non-EU countries. Figure 2 summarizes Kosovo's imports from 2006 to the last quarter of 2021. Compared to exports, Kosovo shows a large imbalance and, as with exports, imports more goods from EU and CEFTA countries and less from other European and non-European countries.

Data and Methodology

Our study uses quarterly time series data on real GDP, real exports, and real imports collected by the Kosovo Agency of Statistics (<https://ask.rks-gov.net/>). The methodology used in this study spans the quarterly time series from Q1-2010 to Q3:2021, or 47 observations, which should be sufficient to capture the short-term and long-term relationships between variables in the model (Jiying et al., 2020). The data are analyzed using EViews 10.

Before testing the relationship between these variables, we first examined the stationarity properties of each variable using the ADF, P-P, and KPSS tests. The ADF test is expressed as follows:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^m \alpha_i \Delta Y_{t-i} + \varepsilon_t \quad (1)$$

where ε_t is a pure white noise error term and where $\Delta Y_{t-i} = (Y_{t-i} - Y_{t-2})$, $\Delta Y_{t-2} = (Y_{t-2} - Y_{t-3})$, etc.

Phillips and Perron employ nonparametric statistical approaches to account for serial correlation in error terms without adding lagged difference terms (Gujarati & Porter, 2009). When the level of a variable turns out to be non-stationary, the ADF test is applied to the first difference of the variables. If the first difference of the variable is found to be stationary, we can conclude that the variable is integrated with order one I(1) and has a unit root (Zang & Baimbridge, 2012).

The short-term relationship between these variables according to the VAR model is formulated as follows:

$$Export_t = \alpha_1 + \sum_{j=1}^K \beta_j Export_{t-j} + \sum_{j=1}^K \gamma_j Import_{t-j} + \sum_{j=1}^K \delta_j GDP_{t-j} + u_{1t} \quad (2)$$

$$Import_t = \alpha_2 + \sum_{j=1}^K \beta_j Export_{t-j} + \sum_{j=1}^K \gamma_j Import_{t-j} + \sum_{j=1}^K \delta_j GDP_{t-j} + u_{2t} \quad (3)$$

$$GDP_t = \alpha_3 + \sum_{j=1}^K \beta_j Export_{t-j} + \sum_{j=1}^K \gamma_j Import_{t-j} + \sum_{j=1}^K \delta_j GDP_{t-j} + u_{3t} \quad (4)$$

Export is a function of its own lagged values and the lagged values of import and GDP. Import is a function of its own lagged values and the lagged values of export and GDP. GDP is a function of its own lagged values and the lagged values of export and import.

Results

The results of the unit root tests are shown in Table 1. All three tests, ADF, P-P, and KPSS, show that all three variables are nonstationary at the level and stationary at the first difference. This means that all variables are integrated with order 1, i.e. I(1).

Table 1. Results of the unit root tests

Variables	ADF	P-P	KPSS
<i>Level</i>			
GDP	-1.401	-2.540	0.906
EXPORT	3.565	0.607	0.659
IMPORT	1.646	-2.310	0.873
<i>First difference</i>			
GDP	-5.840***	-12.706***	0.235***
EXPORT	-8.508***	-8.505***	0.280***
IMPORT	-4.177***	-11.939***	0.199***

*** denotes rejection of the null hypothesis of unit root at 1 percent level of significance

Table 2. Johansen cointegration test results

No. Of CE(s)	Trace Statistic	Prob.	Max-Eigen Values	Prob.
None	21.737	0.313	17.176	0.163
At most 1	4.561	0.853	4.490	0.804
At most 2	0.070	0.789	0.070	0.789

We used the Johansen cointegration test to check whether the variables are cointegrated. The results of the Johansen cointegration test are shown in Table 2. Both the Trace and Maximum-Eigenvalue test statistics show that there is no cointegration. This means that there is no long-term relationship between GDP, exports, and imports in Kosovo. Therefore, we need to perform VAR analysis.

Table 3. VAR lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1101.195	NA	1.90e+20	55.20977	55.33644	55.25557
1	-1091.760	16.98364	1.87e+20	55.18801	55.69467	55.37120
2	-1044.625	77.77265	2.80e+19	53.28126	54.16792	53.60185
3	-1023.529	31.64411	1.56e+19	52.67645	53.94311*	53.13444
4	-1008.670	20.05967	1.21e+19	52.38350	54.03016	52.97888
5	-992.9383	18.87813*	9.29e+18*	52.04691	54.07357	52.77969*
6	-982.9603	10.47690	9.84e+18	51.99801*	54.40467	52.86818

First, the VAR analysis was applied with the given lags, and then we used some criteria to determine the order of the lags. Table 3 shows the selection criteria for the order of lags at VAR. Multiple criteria can be used to determine the optimal lag length. However, after the lag's selection tests, different lag lengths were proposed. The lag length was set to 5 (five) based on three criteria: LR, FPE, and HQ. Then, the analysis VAR is performed with five lags.

Before testing the VAR causality between exports, imports, and GDP, we ran a diagnostic to check whether the model is stable. Table 4 shows the results of the LM test, the normality test, and the heteroskedasticity test. As for the serial correlation between variables, all lags have probability values greater than 0.05 except lag 4, whose probability value is less than 0.05. These values show that our VAR model does not suffer from autocorrelation. The Jarque-Bera test determines the two values of skewness and kurtosis for the normality test. With the exception of GDP, which is not normally distributed, the other two variables, exports and imports, follow the normal distribution. The last part of the table summarizes the results of the heteroskedasticity test. Since the probability value $p=0.350$ is greater than 0.05, we can conclude that there is no heteroscedasticity in our model.

Table 4. Independence of error terms – LM test

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	15.32544	9	0.0824	1.846098	(9, 48.8)	0.0835
2	14.92238	9	0.0931	1.790303	(9, 48.8)	0.0943
3	7.683710	9	0.5663	0.858102	(9, 48.8)	0.5679
4	18.59626	9	0.0289	2.315118	(9, 48.8)	0.0294
5	4.434920	9	0.8805	0.479856	(9, 48.8)	0.8811
Component		Jarque-Bera		df	Prob.	
1		19.98255		2	0.0000	
2		1.383845		2	0.5006	
3		0.303588		2	0.8592	
Chi-sq			df	Prob.		
186.7144			180	0.3503		

Table 5. Causality results based on Vector of Autoregression

Dependent Variables	χ^2 statistic		
	Δ Export	Δ Import	Δ GDP
Δ Export	—	15.586***	17.354***
Δ Import	6.718	—	1.211
Δ GDP	23.417***	25.265***	—

Note: Δ Export, Δ Import and Δ GDP denote the first differences of the values of export, import, and GDP, respectively. (***) denotes the rejection of the null hypothesis at the 1% level of significance.

Table 5 shows the results of causality between exports, imports, and GDP. These results show that there is a bidirectional causality between exports and GDP ($\chi^2=17.354$ & $\chi^2=23.417$ at $p=0.000<0.01$). This is consistent with the findings of several studies such as the study by Rani and Kumar (2018) for BRICS countries (Brazil, Russia, India, China, and South Africa) and Jordaan and Eita (2007) for Namibia. Kristjanpoller and Olson (2014) found that data for nine countries (Bolivia, Brazil, Colombia, Dominican Republic, Ecuador, El Salvador, Mexico, Paraguay, and Peru) support the ELG theory. Agbo et al. (2018) found that exports have a significant impact on Nigerian economic growth. The validity of the export-led growth hypothesis (ELGH) was also confirmed by Agrawal (2015) in India.

There is unidirectional causality from exports to imports ($\chi^2=15$, $p<0.01$) and unidirectional causality from GDP to imports ($\chi^2=25.265$, $p<0.01$). El Alaoui (2015) found unidirectional causality from exports to imports and bidirectional causality between imports and growth in Morocco. Similarly, Kogid et al. (2011) confirmed that economic growth in Malaysia has Granger causality with imports and concurrent imports have Granger causality with economic growth, while in our study, as explained below, import is not a cause of economic growth.

There is no causality from imports to exports ($\chi^2=6.718$, $p>0.05$) and from imports to GDP ($\chi^2=1.211$, $p>0.05$). Jordaan and Eita (2007) and Agbo et al. (2018) also found that imports do not cause economic growth. The same results are found in Uddin et al.'s (2010) in Bhutan, where exports cause both GDP and imports, but imports cause neither GDP nor exports. These results suggest that exports are an important factor in economic growth in Kosovo, while imports are not. Moreover, economic growth stimulates both exports and imports. Kristjanpoller and Olson (2014) argued that export-led growth and import-led growth cannot theoretically exist simultaneously in one country.

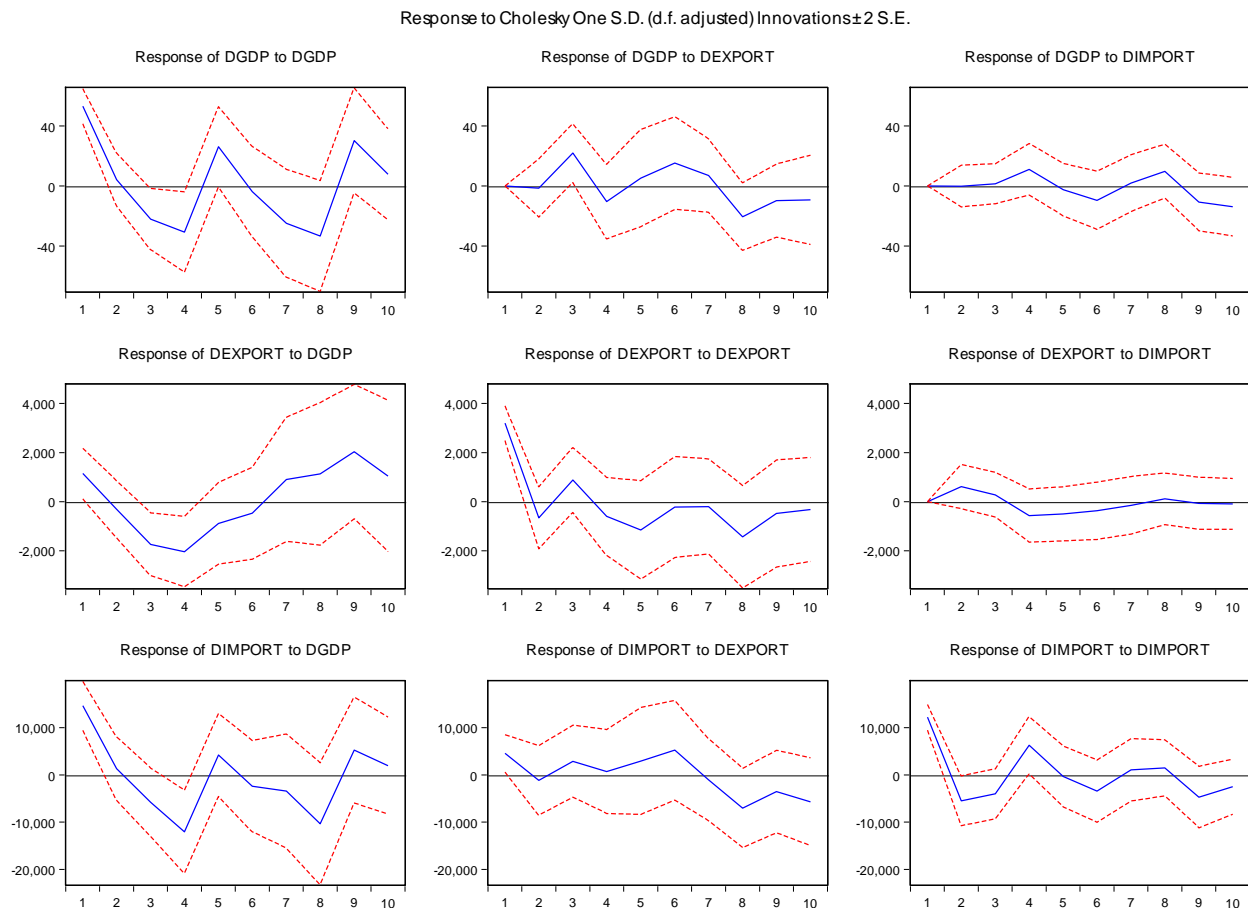


Figure 3. Impulse Response Functions (IRF) results

Impulse response functions (IRF) allow us to study the dynamic effects of the shock of a given variable on the other variables included in the same model (Mohsen, 2015). The first part of the figure shows the responses of GDP to exports and imports. GDP responded positively to exports from period 2 to 3, with a small and negative decrease in period 4. From period 5 to period 7, GDP responded positively to exports. After period 7, GDP remained in negative territory. In period 2, an import shock began, to which GDP responded positively until period 3. After period 3 until period 7, GDP reacted negatively to imports. After period 8, the shock continued in the negative territory.

As for the response of exports to GDP, we can see that exports responded positively to GDP from period 1 and negatively until period 6. After period 6, exports responded positively, and the remaining periods remained in the upper range. Exports reacted slightly positively from period 1 to period 3. From period 3 to period 4, there is a decline. From period 4 to period 7, imports respond increasingly, but remain on the negative side of the axis. After period 8, the shock is already zero.

As for the response of imports to GDP, we can see that imports have declined significantly from the positive territory in period 1 to the negative territory in period 4. From period 4 to 5, the shock becomes positive. The response of imports to GDP is volatile in all periods. Imports responded similarly to exports, but with equal decreases and increases.

Conclusion and Implications

This study sought to examine the impact of exports and imports on Kosovo's economic growth using quarterly time series data from 2010 to 2021. The unit root tests, Johansen cointegration test, VAR analysis, Granger causality test, and impulse response functions (IRF) were used to test the relationship between these variables. The unit root tests showed that the three variables were stationary at first difference $I(1)$. Johansen cointegration showed that the variables were cointegrated in the short run, which led us to apply Granger causality based on the VAR analysis. The Granger causality results showed a bidirectional causal relationship between exports and economic growth. However, imports did not have a significant impact on economic growth in Kosovo. Finally, there was a unidirectional causal relationship running from exports to imports. The impulse response functions (IRF) showed that GDP responds abruptly to a shock in exports by increasing initially and decreasing in later periods. GDP responds only weakly to import shocks. These results clearly support the ELG hypothesis.

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