Research Article

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The Causal Relationship Between Export, Import and Harmonized Consumer Price Index: Evidence from Kosovo

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Abstract

The purpose of this paper is to analyze the causal relationship between export, import, and inflation for Kosovo which is a developing country. Pointedly, we examine empirically this relationship by deliberating that export and import influence the harmonized consumer price index, which is expressed as the inflation rate. This paper employs time series monthly data for the period 2010-Jan to 2020-Dec extracted from Kosovo's Agency of Statistics. Since these variables were stationary at different levels, we have integrated the Toda-Yamamoto approach to Granger causality. The proposed model was free of autocorrelation and no root lied outside the unit circle indicating that the model is stable. The results of Granger causality revealed that export causes import and import causes export, export does not cause inflation, and inflation does not cause export. However, import caused inflation, and inflation caused import. Henceforth, we have performed the Impulse Response Function to analyze the interaction between variables in a vector autoregressive model and we have performed variance decomposition to check the variability in the dependent variable lagged by its variance. The study is spectacled that import is the main vehicle of economic development of Kosovo and for this reason, import causes inflation rate. The results of this study imply that the Kosovar government should take measures to control the effect of imports on increasing of consumer prices.

Keywords: *Export, Import, Inflation, Causal Relationship*

1. Introduction

The significance of international trade as a development driver has been highly emphasized over years (Awokuse, 2007). Although there is a vast number of studies on export and import and their effect on economic growth or their relationship with other macro-economic variables, no study engaging time series data was conducted to analyze these variables for Kosovo.

Export and import price indices are critical for determining how international trade affects the domestic economy. Among their most significant applications include assessing trade balance trends, quantifying the impact of foreign prices on domestic inflation, and deflating nominal values of

exports and imports to estimate the amount of gross domestic product (Dridi and Zieschang, 2004). Export of goods is related to tangible goods sent abroad. If the goods are sent abroad to stay abroad permanently, then such export is called regular (permanent) export, and if the goods are sent abroad to return to the country after a certain time, then such export is called temporary export (Kukaj, 2017). The import of goods is related to tangible goods brought to a country. If the goods are brought to stay within a country, then such import is called regular (permanent) import, and if the goods are brought to the country to return abroad after a certain time, then such import is called temporary import (Kukaj, 2017).

The Consumer Price Index (CPI) is one of the main macroeconomic indicators and plays a significant role in monetary policy and economic analysis (Zuzana, 2010). The CPI is one of the most important economic indicators used to track changes in the cost of consumer goods and services purchased, utilized, or paid for by households over time (Gjika-Dhamo et al., 2018). On the other hand, the Harmonized Index of Consumer Prices (HICP) is the index of price stability defined by the European Central Bank and is confined to the countries of the European Union which have adopted the Euro as their currency. Loosely said, it is the target price index for the European Central Bank (Diewert, 2002). The HICP measures consumer price inflation in a globally comparable way and the EU requires member countries and prospective members to produce an HICP (Sincavage, 2007). In reaction to technology and other factors affecting costs and quality, relative prices of different goods and services change frequently, thus resulting in a shift in consumer buying habits (Boskin et al., 1998). Zuzana (2010) analyses the differences between the harmonized indices of consumer prices and the national consumer price indices and she argues that the main differences are geographic and population coverage. When the residence concept is applied, the CPIs reflect price changes in all goods and services purchased by a consumer living in the country concerned, including their purchases outside of the country. On the other hand, the domestic concept encompasses every consumption cost in the country, regardless of who has purchased the products or services (residents or non-residents).

This study examines the causal relationship between exports, imports, and harmonized consumer price index for Kosovo in a Toda-Yamamoto framework. In particular, the paper addresses the issues related to export and import to directly account for the contribution of the harmonized consumer price index. The motivation behind this study stands on that these variables are not analyzed for Kosovo and no recommendation is given related to these variables. Therefore, this is the first study that analyzes the causal relationship between export, import, and harmonized consumer price index for Kosovo using data for such a long period, with a total of 132 observations for each variable.

2. Literature Review

International trade is the most common type of international business which has shaped world history. It involves the exchange of goods and services across national boundaries (Seyoum, 2009).

Export and import and their relationship with economic growth have been extensively studied. Taghavi et al., (2012) studied the impact of export and import on the economic growth of Iran using data from 1962 to 2011. Employing VAR analysis, they confirmed a long-run relationship between these variables and that export has a direct and positive relationship with economic growth in the long run, but import has a significant and negative relationship with economic growth in long-term. Similarly, Velnampy and Achchuthan (2013) revealed that export and import have a significant and positive relationship with each other, and both export and import have a significant impact on economic growth, using data from 1970 to 2010 in Sri Lanka.

Çetintaş and Barişik (2009) analyzed the relationships between export, import, and economic growth for 13 transition economies including Armenia, Belarus, Bulgaria, Czech Republic, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, Poland, Russia, Slovak Republic, and Slovenia. Using panel causality, they support that there is causality from growth to export between economic growth and

export. The increasing productivity in manufacturing leads to an increase in competitive competencies in price and quality of these places, which in order leads to a longer-term export boom. Using a neoclassical growth modeling framework and multivariate cointegrated VAR methods to investigate the contribution of both exports and imports to economic growth in Bulgaria, Czech Republic, and Poland, Awokuse (2007) suggest that trade stimulates economic growth. The author demonstrated that export leads to GDP and GDP leads to export in these three countries and that imports play as much of a role as exports in stimulating economic growth in these countries. In another study, Awokuse (2008) examined the relationship between trade and economic growth in Argentina, Colombia, and Peru with emphasis on the role of exports and imports. In this case, the author reported for the evidence supporting the export-led growth, but the empirical support for import-led growth was relatively stronger.

The relationship between these three variables has been analyzed by other researchers as well. Akhter (2015) revealed the positive impact of export on economic growth and the opposite effect of imports on economic growth in Bangladesh. Kogid et al., (2011) argued that import could indirectly contribute to economic growth and economic growth could directly contribute to import. Uğur (2008) showed that GDP and investment goods import and raw materials import in Turkey have a bidirectional relationship, but GDP and consumer goods and other goods import have a unidirectional relationship. Baharumshah and Rashid (1999) studied the relationship between these three variables for Malaysia; Ramos (2001) for Portugal; Din (2004) for the South Asia region; Uddin et al., (2010) for Bhutan; Hye and Boubaker (2011) for Tunisia; Hye (2012) for China; Khan et al., (2012) for Pakistan; Zang and Baimbridge (2012) for South Korea and Japan; Kristjanpoller and Olson (2014) for Latin American countries; Alaoui (2015) for Morocco; Andrews (2015) for Liberia; Vardari (2015) for Kosovo; Bakari (2016) for Egypt; Mehta (2017) for India; Rani and Kumar (2018) for BRICS countries; Bakari et al., (2019) for Brazil; Ceesay et al., (2019) for Gambia; Raghutla and Chittedi (2020) again for BRICS countries; Okyere (2020) for Ghana, etc.

Even though export and import are closely related to economic growth, they can affect inflation too, with CPI as its indicator. Ulke and Ergün (2011) studied the relationship between import volume and inflation for the Turkish economy over the period 1995-2010 and found that there is a one-way Granger causality from import to inflation. Ahmed et al., (2018) examined the relationship between exports, imports, and inflation in Pakistan. The Granger causality results indicated that a 1% increase in exports and imports cause a 0.63% and 0.57% increase in the CPI (inflation), respectively. Sahoo and Sethi (2018) also examined the relationship among inflation, export, import, and foreign direct investment in India from 1975 to 2017. They confirmed that export has a positive influence on inflation than other variables like import and FDI. The Granger causality approach indicated that there is unidirectional causality between exports and inflation and not vice versa, whereas inflation granger caused import.

3. Export, Import and Harmonized Consumer Price Index in Kosovo

Kosovo Agency of Statistics is a professional institution that deals with the collection, processing, and publication of official statistical data (ASK, 2021). Data from Foreign Trade of Kosovo show a higher trade deficit for (45.8%) in March 2021, compared to the same period of 2020, respectively in the amount of 320.7 million euros compared to the deficit of 219.9 million euros in 2020. Exports cover imports (16.2%) (ASK, 2021). Exports of goods in March 2021 amounted to 61.8 million euros, while imports were 382.5 million euros, an increase of 92.2% for exports and 51.8% for imports compared to the same period of 2020 (ASK, 2021).

According to the data of the main export groups are: 35.1% of the exports are basic metals and articles thereof, 17.2% miscellaneous manufactured articles, 9.5% plastics, rubber and articles thereof, 7.3% prepared foods, beverages and tobacco, 7.0% mineral products, 5.5% textiles and textile articles, 4.2% machinery, mechanical and electrical equipment, etc. While according to the data of the main groups for import are: 12.6% machinery, mechanical and electrical equipment, 11.9% mineral

products, 11.7% prepared foods, beverages and tobacco, 9.9% means of transport, 9.8% base metals and articles thereof, 9.3% chemical industry products, 7.5% plastics, rubber and articles thereof, etc (ASK, 2021).

Kosovo HICP, produced by the Kosovo Agency of Statistics (KAS), is compiled according to the methods of the Harmonized Index of Consumer Prices (HICP). Eurostat has defined the HICP as the European standard for consumer price indices. The calculated index and its results are presented through the Classification of Individual Consumption by Purpose (COICOP), this international classification that classifies consumption into Divisions, Groups, and Item Classes (ASK, 2021). Kosovo Agency of Statistics (KAS) has started to publish the Consumer Price Index (CPI) in September 2002 until December 2014, while from January 2016 it has been harmonized according to the international concept and published as a Harmonized Price Index of Consumer (HICP) (ASK, 2021). Monthly inflation measured by the harmonized index of consumer prices was —0.2% in May 2021. The annual inflation rate measured in May 2021 with May 2020 was 2.0%. The overall harmonized consumer price index is higher at an average of 2.0 percent in May 2021 compared to May 2020. This is mainly explained by the increase in consumer prices in this period in the COICOP subgroups: bread and cereals (1.6%), edible oils and fats (23.2%), alcoholic beverages (1.8%), tobacco (4.5%), gas (6.4%), solid fuels, firewood, pellets, etc. (2.7%), household appliances (1.6%), pharmaceuticals (1.7%), fuels and lubricants for personal transport equipment (25.6%), telephone and fax services (20.3%)), hotel services (1.0%), personal care (1.7%), financial services (4.2%), with a combined impact of these subgroups of 2.7 percent on the HICP (ASK, 2021).

While a decrease in prices is observed in the COICOP subgroups: milk, cheese and eggs (—1.3%), fruit (—16.1%), electricity (—10.6%) the decrease in the price of electricity has come from the implementation of the Law on Economic Recovery Covid -19 Nr. 07 / L-016 article 15, for the period January – May 2021. Telephone and fax equipment (—4.0%), with a joint impact of these subgroups of —0.7 percent in the HICP (ASK, 2021).

Figures 1, 2, and 3 visualize the exports, imports, and harmonized consumer price index for the years 2010-2020. Exports and Imports have experienced increases and decreseas, that is, shocks during these periods. The harmonized consumer price index index has experienced a continual increase from 2010 to 2020.

Figure 1: Exports for the years 2010 – 2020
Source: Generated from series data in Excel

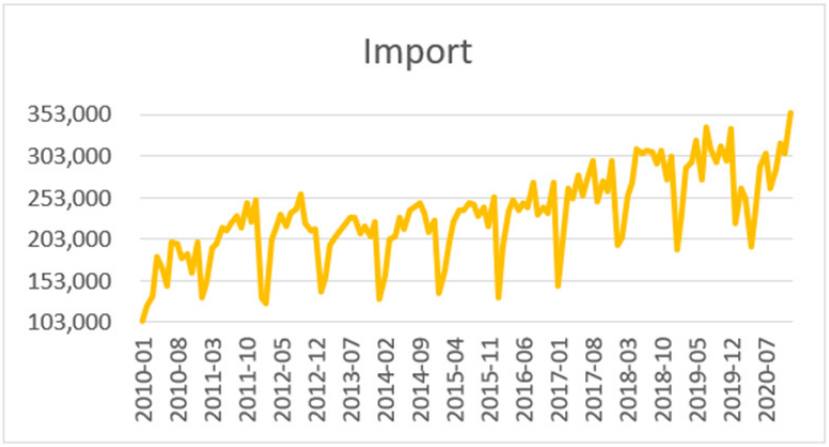

Figure 2: Imports for the years 2010 – 2020
Source: Generated from series data in Excel

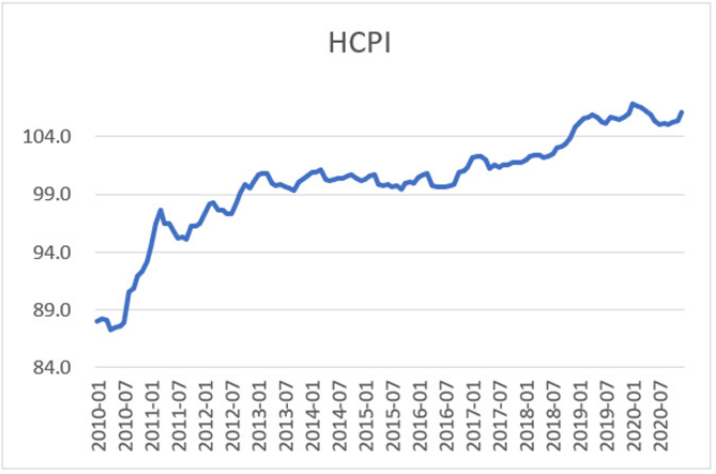

Figure 3: Harmonized annual consumer price index for the years 2010 – 2020
Source: Generated from series data in Excel

4. Data and Methodology

The data for this study are collected from reports published by the Kosovo Agency of Statistics (KAS). The data are monthly and cover a period from 2010-01 to 2020-12 resulting in a total of 132 observations for each variable. We have analyzed our data using EViews software. Econometricians are constantly challenged with developing models that are both general enough to analyze complex problems and restrictive enough to yield sharp finite sample inferences. This task can sometimes be accomplished by employing an overparametrized model, that is, a model with more parameters than can be reasonably estimated with the available data, and then seeking plausible constraints that allow adequate inference (George et al, 2008). To analyze the relationship between the variables in our model, we have used the VAR model. When we are unsure whether a variable is exogeneous or

endogeneous, it is a natural extension of transfer function analysis to treat each variable symmetrically (Enders, 2015). A general dynamic interaction among export, import and harmonized consumer price index can be modeled using k-th order trivariate panel vector autoregressive (VAR) equations as follows:

$$EX_{i,t} = \alpha_{1i} + \sum_{p=1}^{K} \beta_{1i,p} EX_{i,t-p} + \sum_{p=1}^{K} \gamma_{1i,p} IM_{i,t-p} + \sum_{p=1}^{K} \delta_{1i,p} HCPI_{i,t-p} + \varepsilon_{1i,t}, (1)$$

$$IM_{i,t} = \alpha_{2i} + \sum_{p=1}^{K} \beta_{2i,p} EX_{i,t-p} + \sum_{p=1}^{K} \gamma_{2i,p} IM_{i,t-p} + \sum_{p=1}^{K} \delta_{2i,p} HCPI_{i,t-p} + \varepsilon_{2i,t}, (2)$$

$$HCPI_{i,t} = \alpha_{3i} + \sum_{p=1}^{K} \beta_{3i,p} EX_{i,t-p} + \sum_{p=1}^{K} \gamma_{3i,p} IM_{i,t-p} + \sum_{p=1}^{K} \delta_{3i,p} HCPI_{i,t-p} + \varepsilon_{3i,t}, (3)$$

where $\varepsilon_{1i,t}$, $\varepsilon_{2i,t}$, $\varepsilon_{3i,t}$ denote individual white-noise errors.

5. Results and Discussion

5.1 Order of Integration

In the initial phase of the estimation procedure, the study analyses the stationarity conditions of the data series. There are significant differences between a trending series and a stationary series. Shocks to a stationary time series must be temporary; the effects of the shocks will dissipate over time, and the series will revert to its long-run mean level. A series with a stochastic trend, on the other hand, will not revert to a long-run level (Enders, 2015). As a result, by removing the deterministic trend, a trend stationary series can be transformed into a stationary series. By differencing, a series with a unit root, also known as a difference stationary (DS) series, can be transformed into a stationary series (Enders, 2015). To determine the order of the integration, we have used Augmented Dickey-Fuller (ADF), Philips-Perron (P-P), and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests.

Table 1: Univariate unit root tests

Variables	ADF	P-P	KPSS
Level			
EXPORT	−3.8450**	−3.6023**	1.1311
IMPORT	−1.3444	−4.5265**	1.4242
HCPI	−2.5141	−2.672	1.1785
First difference			
EXPORT	−11.3431**	−17.2121**	0.1182**
IMPORT	−5.5626**	−27.2574**	0.1253**
HCPI	−2.8320	−8.4385**	0.2580**
Second difference			
EXPORT	-	-	-
IMPORT	-	-	-
HCPI	−9.3191**	-	-

** and * denote rejection of the null hypothesis at 1% and 5% respectively.

Source: Generated from EViews

Using ADF, P-P, and KPSS unit root tests, we found that export has no unit root at the level according to ADF and is stationary at the first difference according to KPSS. Import has no unit root at the first difference according to the ADF and P-P and is stationary at the first difference according to KPSS.

HCPI has no unit root at the second difference according to ADF but is stationary at the first difference according to P-P and KPSS. These results indicate that the integrating order of the variables is I(2). Therefore, the Toda-Yamamoto test involves the addition of two extra lags of each of the variables to control for potential cointegration (Mishra, 2014).

Hence, in a perspective of the Toda-Yamamoto approach, we can write the equations as:

$$EX = \alpha_1 + \sum_{i=1}^{k}\beta_{1i}EX_{t-i} + \sum_{j=k+1}^{k+d_{max}}\beta_{1j}EX_{t-j} + \sum_{i=1}^{k}\gamma_{1i}IM_{t-i} + \sum_{j=k+1}^{k+d_{max}}\gamma_{1j}IM_{t-j} + \sum_{i=1}^{k}\delta_{1i}HCPI_{t-i} + \sum_{j=k+1}^{k+d_{max}}\delta_{1j}HCPI_{t-j} + \varepsilon_{1t} \quad (4)$$

$$IM = \alpha_2 + \sum_{i=1}^{k}\beta_{2i}EX_{t-i} + \sum_{j=k+1}^{k+d_{max}}\beta_{2j}EX_{t-j} + \sum_{i=1}^{k}\gamma_{2i}IM_{t-i} + \sum_{j=k+1}^{k+d_{max}}\gamma_{2j}IM_{t-j} + \sum_{i=1}^{k}\delta_{2i}HCPI_{t-i} + \sum_{j=k+1}^{k+d_{max}}\delta_{2j}HCPI_{t-j} + \varepsilon_{2t} \quad (5)$$

$$HCPI = \alpha_3 + \sum_{i=1}^{k}\beta_{3i}EX_{t-i} + \sum_{j=k+1}^{k+d_{max}}\beta_{3j}EX_{t-j} + \sum_{i=1}^{k}\gamma_{3i}IM_{t-i} + \sum_{j=k+1}^{k+d_{max}}\gamma_{3j}IM_{t-j} + \sum_{i=1}^{k}\delta_{3i}HCPI_{t-i} + \sum_{j=k+1}^{k+d_{max}}\delta_{3j}HCPI_{t-j} + \varepsilon_{3t} \quad (6)$$

where $\alpha, \beta, \gamma, \delta$ are the parameters of the model; dmax is the maximum order of integration to happen in the system, and ε_{1t}, ε_{2t}, and ε_{3t} are the residuals of the model.

In the next step, we have run a restricted VAR to select the optimal lag number based on the lowest value provided by the following information. According to the Akaike Information Criterion (AIC) in Table 2, the optimal lag number is five (5).

Table 2: VAR lag order selection criteria

Lag	LogL	LR	FPE	AIC	SBC	HQC
0	-3032.752	NA	3.69e+17	48.96374	49.03198	48.99146
1	-2733.508	579.1823	3.42e+15	44.28239	**44.55532***	44.39326
2	-2718.920	27.52835	3.13e+15	44.19226	44.66989	44.38629
3	-2700.909	33.11721	2.71e+15	44.04692	44.72925	**44.32410***
4	-2689.734	20.00760	2.62e+15	44.01184	44.89886	44.37217
5	-2674.279	26.92137	**2.36e+15***	**43.90772***	44.99945	44.35121
6	-2668.866	9.166252	2.51e+15	43.96559	45.26201	44.49222
7	-2664.313	7.491996	2.71e+15	44.03730	45.53842	44.64709
8	-2652.893	**18.23400***	2.62e+15	43.99828	45.70409	44.69122

Source: Generated from EViews

After the lag selection, we estimated the VAR model engaging the Toda-Yamamoto approach. Since the results of Vector of Autoregression Estimates are practically impossible to interpret, we estimated these models to be able to test for causality and compute Variance Decompositions and Impulse Response Functions. Before interpreting the results of Toda-Yamamoto causality, we first tested for diagnostic checks.

Table 3: Independence of error terms – LM test

Lags	LM Statistics	Prob.
1	23.02978	0.0061
2	11.89765	0.2191
3	24.67443	0.0034
4	15.29735	0.0831
5	11.28116	0.2569

Source: Generated from EViews

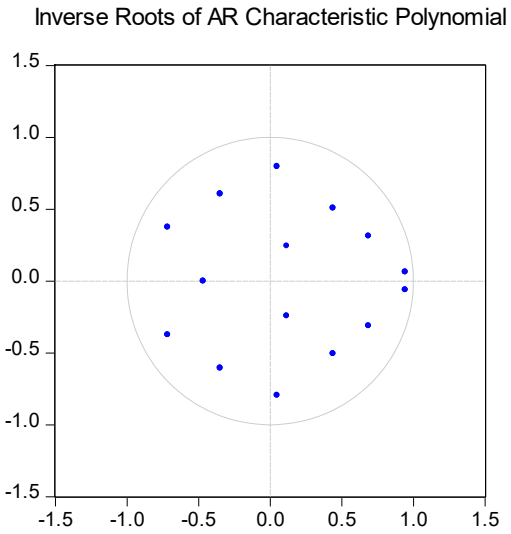

Figure 4: Dynamic stability of model
Source: Generated from EViews

Results in Table 3 show that the specified model does not suffer from autocorrelation. With the exclusion of Lag 1 and Lag 3, Prob values for other lags are greater than 5 percent. Furthermore, Figure 4 shows that no root lies outside the unit circle and VAR satisfies the stability condition. This means that the model is dynamically stable.

Table 4: Toda-Yamamoto Causality Test Results

	Chi-sq	df	Prob.	S/NS
Export → Import	22.3892	5	0.000	S
Import → Export	24.7256	5	0.000	S
Export → HCPI	4.9316	5	0.424	NS
HCPI → Export	10.1428	5	0.071	NS
Import → HCPI	21.4663	5	0.000	S
HCPI → Import	13.1132	5	0.022	S

Source: Generated from EViews

In Table 4, we present the results of the Toda-Yamamoto causality test. There is bidirectional causality between Export and Import. This implies that an increase in export will lead to an increase in import (χ^2=22.3892, p<0.01), and an increase in import will lead to an increase in export (χ^2=24.725, p<0.01). Further, the results negate the causality between Export and HCPI. None of the variables cause each other (χ^2=4.9316, p>0.05 and χ^2=10.1428, p>0.05). Finally, the results reveal that there is a bidirectional relationship between Import and HCPI. An increase in import will lead to an increase in HCPI (χ^2=21.4663, p<0.01), and an increase in HCPI will lead to an increase in import (χ^2=13.1132, p<0.05).

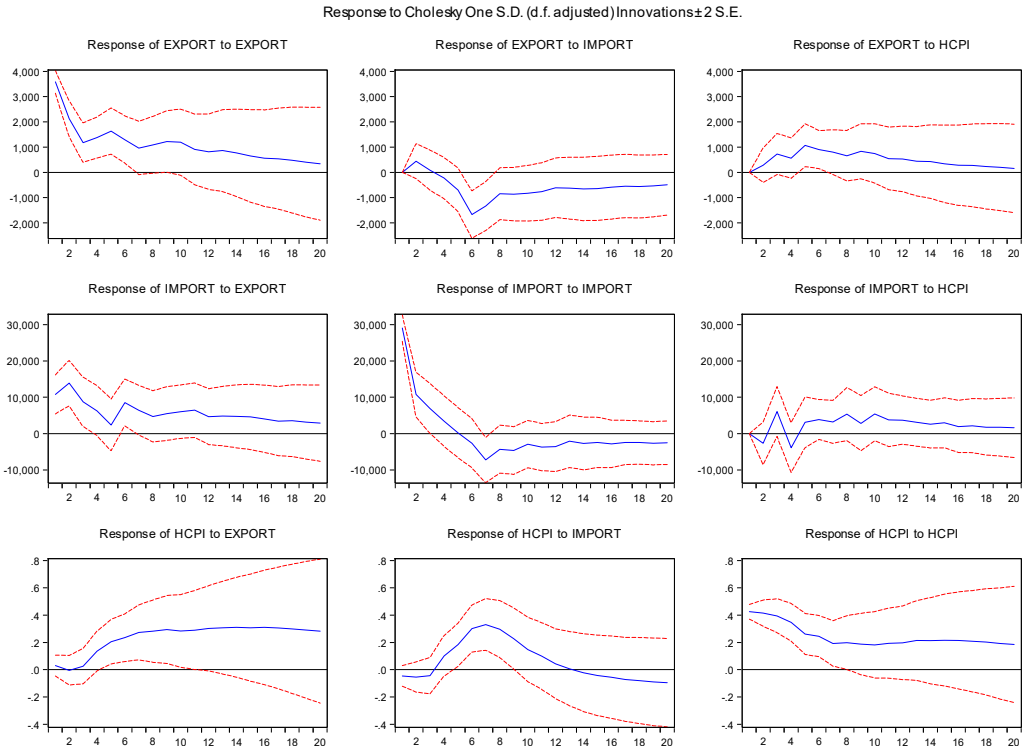

Figure 5: Impulse response function (IRF)
Source: Generated from EViews

In Figure 5, we performed Impulse Response Function to elaborate the reactions of variables in response to each other. In the upper part of the figure, the response of export to import and HCPI are presented. There is an increase of export to import in the first periods, but after the third period, the shock declines and continues to decline until the sixth period. After the sixth period, there is a gradual increase of export to import until the last period and this shock seems to continue increasing. Export responded positively to HCPI from period 1-3 with a slight decline on period 4 and after period 4 there are slight declines and inclines. However, the trend continues to decrease after the period 10 to infinite. The import starts with an increase in period 1 in response to export and with a decrease from period 2-6. After period 6 there is an increase until period 8. After period 8, import gradually decreases until period 20. In response to HCPI, import is negative in the first periods, with a decrease in period 3 and a negative decrease in period 4. After period 4 there is a gradual increase in the positive area and these shocks remain in the positive area where the trend seems to have a negative direction forward the period 20. In response to export, HCPI responded positively to export, with a decrease in periods 2-3 to a continual increase from period 4 to last period. This implies that HCPI has responded with increases to export. In response to import, HCPI is negative from period 1 to 3, with a significant increase after period 4 to 88, which after the shocks start declining to become negative after period 13 to period 20. This means that HCPI has been influenced by import, where initially import increased HCPI, but afterward, HCPI decreased with the import.

Table 5: Variance decomposition of Export

Period	S.E.	EXPORT	IMPORT	HCPI
1	3580.999	100.0000	0.000000	0.000000
2	4200.830	98.43963	1.109167	0.451200
3	4423.711	95.84857	1.035309	3.116117
4	4673.786	94.59458	1.166258	4.239162
5	5113.625	89.24496	2.812908	7.942128
6	5605.159	79.62825	11.17577	9.195980
7	5895.049	74.65639	15.19347	10.15015
8	6089.826	73.15212	16.17085	10.67704
9	6325.807	71.54179	16.83961	11.61860
10	6533.755	70.41310	17.38507	12.20184
11	6662.980	69.57215	18.01723	12.41061
12	6760.734	69.02554	18.30810	12.66636
13	6858.322	68.65495	18.62561	12.71944
14	6945.511	68.17160	19.04702	12.78138
15	7012.714	67.72422	19.50998	12.76581
16	7064.993	67.35427	19.90519	12.74054
17	7111.616	67.05285	20.22651	12.72063
18	7154.325	66.71574	20.60751	12.67675
19	7188.271	66.39769	20.96403	12.63828
20	7214.773	66.13203	21.27602	12.59194

Source: Generated from EViews

Table 6: Variance decomposition of Import

Period	S.E.	EXPORT	IMPORT	HCPI
1	30992.27	12.11691	87.88309	0.000000
2	35727.33	24.20824	75.23999	0.551767
3	37916.83	26.81185	70.12484	3.063316
4	38775.82	28.24460	67.84036	3.915046
5	38976.48	28.33520	67.14698	4.517812
6	40178.47	31.17861	63.63023	5.191156
7	41452.70	31.68367	62.83840	5.477933
8	42286.13	31.70155	61.41519	6.883261
9	42990.21	32.31495	60.58545	7.099608
10	43847.86	32.96205	58.67574	8.362207
11	44634.56	33.90223	57.31430	8.783470
12	45171.47	34.16083	56.59025	9.248917
13	45584.30	34.66940	55.78563	9.544973
14	45984.19	35.13266	55.16947	9.697864
15	46372.13	35.52133	54.52767	9.951001
16	46675.05	35.81792	54.18462	9.997466
17	46916.68	35.98837	53.89967	10.11196
18	47148.36	36.20375	53.63855	10.15770
19	47363.27	36.32439	53.47082	10.20479
20	47543.83	36.41232	53.34412	10.24355

Source: Generated from EViews

Table 7: Variance decomposition of HCPI

Period	S.E.	EXPORT	IMPORT	HCPI
1	0.428055	0.492287	1.181852	98.32586
2	0.598196	0.259501	1.440218	98.30028
3	0.718274	0.306093	1.376106	98.31780
4	0.815329	3.049948	2.576084	94.37397
5	0.899425	7.740968	6.248960	86.01007
6	1.007632	11.57813	13.94022	74.48164
7	1.112168	15.56070	20.31630	64.12300
8	1.201653	18.84254	23.50149	57.65597
9	1.271733	22.16763	24.19217	53.64020
10	1.323843	25.04754	23.57337	51.37909
11	1.372608	27.76498	22.44328	49.79174
12	1.419879	30.48743	21.06366	48.44891
13	1.468452	32.89236	19.69539	47.41225
14	1.516093	35.05743	18.49927	46.44331
15	1.562574	36.87965	17.48844	45.63191
16	1.608201	38.51954	16.63083	44.84963
17	1.651674	39.93776	15.95596	44.10628
18	1.692574	41.14885	15.41905	43.43210
19	1.730422	42.20242	15.01769	42.77989
20	1.765609	43.09735	14.71763	42.18502

Source: Generated from EViews

Tables 5, 6, and 7 reports the Variance Decomposition output for export, import, and HCPI. In the first period of Table 5, 100% of forecast error variance in Export is predicted by the Export itself, while Import and HCPI have a strong exogenous impact, which means that they do not influence Export at all in this period. In the first five years, Import and HCPI continue to have a weak influence in predicting the Export. However, after period 5, the impact of Import starts to increase gradually, while HCPI has a constant impact on Export. In the last period, the impact of Export on itself has decreased to 66,13%, while the impact of Import and HCPI has increased, 21,27% and 12.59%, respectively. In Table 6, Import moderately predicts itself in the first period and this effect keeps decreasing to the last year. The effect of Export on Import gradually increases from year 1 to year 20, while the effect of HCPI on Import is not significant. Finally, in Table 7, HCPI significantly predicts itself in the first periods, but this effect has significantly dropped in the last period. The effect of Export is higher in predicting HCPI than the effect of Import. The effect of Import on HCPI is not very significant, but the effect of Export on HCPI has gradually increased to the last period. These results are also presented visually in Figure 6.

6. Conclusion and Implication

In this study, we have attempted to empirically analyze the relationship between export, import, and harmonized consumer price index for Kosovo using monthly data from 2010 to 2020. The data were available at Kosovo's Agency of Statistics and in total 132 observations have been obtained to analyze the aforementioned relationship.

Based on the analyses for the model diagnostics, the models have fulfilled their condition. The results of Granger causality using the Toda-Yamamoto model displayed that the three variables are correlated with each other. Concretely, there was a bidirectional relationship between export and import, where an increase in export led to an increase in import, and an increase in import led to an increase in export. Concerning the relationship between export and harmonized consumer price

index, the results indicated that there is no relationship between export and HCPI. Neither export causes HCPI, nor HCPI causes export. Regarding the relationship between import and HCPI, the results of Granger causality using the Toda-Yamamoto approach showed that an increase in import will affect the HCPI by increasing it, and vice versa, an increase in HCPI will cause an increase in import.

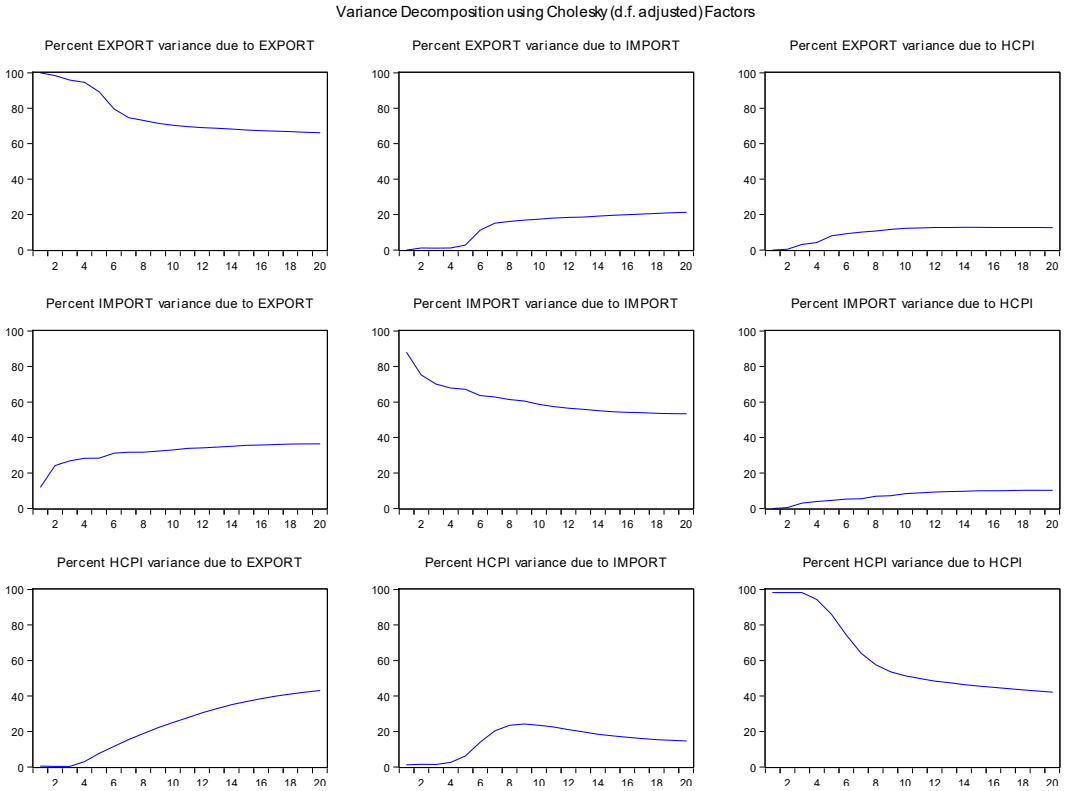

Figure 6: Variance Decomposition
Source: Generated from EViews

Subsequently, these results are presented visually with Impulse Function Response, where each response to each variable shows the shocks during the specified periods. These results are in line with the results from Granger causality results. After this, we run the Variance Decomposition to determine how much of the variability in the dependent variable is lagged by its own variance.

The above results showed that export and import are closely related to each other. However, exports are not a determinant of inflation. Consumer prices are greatly affected by imports. This is normal because Kosovo depends on imports. The most goods are imported from abroad and thus, various factors from abroad affect consumer prices in Kosovo. Initially, exchange rates, the price of transporting goods, the price of raw materials for the production of these imported goods, profit rates of traders, and other macroeconomic factors, affect that goods brought from imports have a significant impact on the inflation rate. As such, exports have no determinative power over consumer prices. On the contrary, Kosovar producers follow the practice of prices similar to those of imported goods, even if their production costs are lower. From this fact, it turns out that Kosovo's economy is significantly dependent on imports.

The Government of Kosovo should apply practices to boost exports, but also impose control measures on extremely high consumer prices, which make it difficult for the consumer basket. When necessary, it should set ceiling prices for certain products within the domestic market.

7. Limitations and Directions for Future Research

This study, like any other, has limitations. Initially, only the relationship between these three variables was investigated. However, these variables have causal relationships with other macroeconomic variables, such as GDP. Because it was difficult to find data for other variables over such a long period of time, future researchers may make efforts to find this data from other sources. Although annual data on macroeconomic variables are available, monthly data for longer time periods are not available in state public reports. In this case, econometric analyses would not make sense due to the scarcity of data. GDP should be included in this model to see how these four variables are related to one another.

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