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Analysis of the Relationship between Service Export and Economic Growth in the Framework of South Caucasus Countries

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Hizmet İhracatı ile Ekonomik Büyüme İlişkisinin Güney Kafkas Ülkeleri Çerçevesinde Analizi

Abstract

In this context, the current article examines the impact of the service sector on the economic growth of Azerbaijan, Armenia, and Georgia. In the study in which three separate causality analyses were made, the results of the Toda-Yamamoto causality test in Azerbaijan and Armenia showed no causality between service exports and economic growth, while for Georgia, there was a unidirectional causality from economic growth to service exports. This study, handled with a different perspective due to the inadequacy of studies on service exports in South Caucasian countries, contributes to filling the gap in the literature on the subject.

Keywords : Service Export, Economic Growth, Azerbaijan, Georgia, Armenia, Causality.

JEL Classification Codes : L8, O4, C51.

Öz

Ele alınan çalışmada Azerbaycan, Ermenistan ve Gürcistan için hizmet ihracatının ekonomik büyüme üzerindeki etkisi incelenmiştir. Üç ayrı nedensellik analizinin yapıldığı çalışmada Azerbaycan ve Ermenistan'da Toda-Yamamoto nedensellik testi sonuçları, hizmet ihracatı ile ekonomik büyüme arasında herhangi bir nedensellik ilişkisinin olmadığını gösterirken, Gürcistan için ise ekonomik büyümeden hizmet ihracatında doğru tek yönlü bir nedenselliğin olduğu tespit edilmiştir. Güney Kafkas ülkelerinde hizmet ihracatına yönelik çalışmaların yetersizliği nedeniyle farklı bir bakış açısı ile ele alınan bu çalışma, konuya yönelik literatürdeki boşluğun doldurulmasına katkı sağlamaktadır.

Anahtar Sözcükler : Hizmet İhracatı, GSYİH, Azerbaycan, Gürcistan, Ermenistan, Nedensellik.

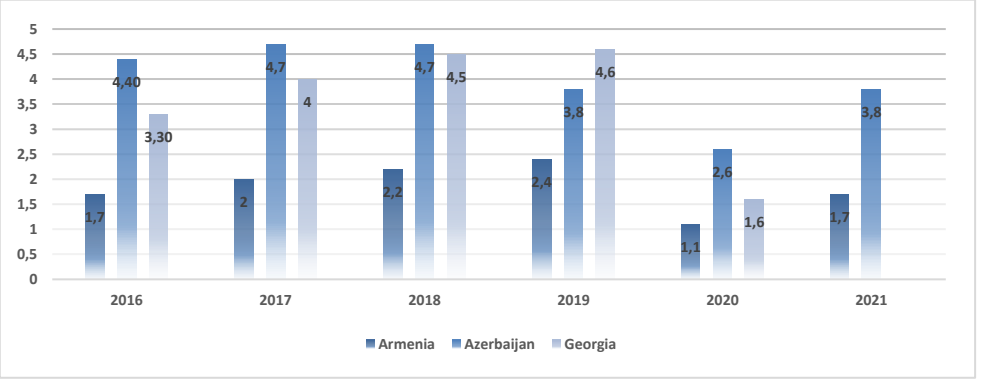
1. Introduction

As proven by the survey of the history of the economy, the transition from an agricultural economy to an industry, then an industrial economy to a service economy, has taken place as an inevitable natural development for the whole world. Transformation in the economies experienced in these periods has introduced changes in household income, and increased demand for services in many domains as human needs have become less and less materialistic. Especially in line with the recent developments in Information and Communication Technologies (ICT), changes that emerged with the global economy have resulted in economic diversifications in the Caucasian Countries, the birthplace of the worldwide oil industry, which yielded significant consequences in the service industry through new initiatives. Although most developing countries are net service importers, it is possible to state that service export would be a new income resource for developing countries, which would display crucial economic growth potential. When such potential is taken into consideration not only as an input for commodity export but as well for services transformed into an ultimate export item for consumption, the objective of the present study is to determine the role of service export of Southern Caucasian Countries[1] in their economic growth based on an export-reliant growth model.

The service industry has grown in two fundamental waves: whereas conventional services constituted the first wave, the second one was built up by modern services (financial, communication, computer, technical, legal, advertisement, and business) (Eichengreen & Gupta, 2009: 15; Ghani, 2009: 24-25). The modern service industry is important to encourage a fast-track global economy and social development and to build up an innovation-oriented society and a world in harmony (Ghani, 2009: 29; Wu et al., 2016: 667). In the service export industry, the revenue generated by the export of modern service sectors usually exhibits growth-creating characteristics whose effect is greater than conventional service sectors (Ghani, 2009: 30; Ghani & Kharas, 2010: 3; Sahoo & Dash, 2017: 447). Graph 1 below summarises conventional and modern service exports for the period of 2016-2020:

[1] *Azerbaijan, Georgia, Armenia.*

Graph: 1
Total Service Export of the South Caucasus Countries (Current $)



Resource: WDB, 2022.

Graph 1 shows that Azerbaijan has made the largest service export in the last six years since 2016, while Armenia has made the least. It is seen that service exports in Azerbaijan were 4.4 billion USD in 2016; this amount decreased to 2.6 billion USD dollars in 2020 and increased to 3.8 billion USD dollars in 2021. In the same graph, it is seen that the service exports of Armenia, which were 1.7 billion dollars in 2016, followed an upward trend until 2019, decreased to 1.1 billion USD dollars in 2020, and increased to 1.7 billion USD dollars in 2021. Finally, when the service exports of Georgia are examined, it is seen that the service exports of 3,30 billion USD dollars in 2016 continued to increase until 2019, decreased to 1.6 billion USD dollars in 2020, and rose to 3.8 billion USD dollars in 2021.

Below, Table 1 exhibits the overall distribution of service exports of Caucasian Countries by sectors:

Table: 1
Distribution of Service Exports of South Caucasus Countries by Sectors (Million US$)

Country	Sector	Year	
		2019	2020
Azerbaijan	Construction	31,589	28,890
	Distribution/Repair	13,567	26,844
	Storage	1,107,970	1,644,680
	Commercial services	3,726,578	2,593,973
	Travel	1,791,514	304,185
	Manufacturing services	513	425
	Telecommunication	27,362	38,429
	Insurance and Retirement services	26,639	21,723
	Financial services	7,298	9,004
	Other personal, cultural and entertainment services	22,461	11,611
	R&D services	2,627	3,576
	Information services	18,639	13,668
	Computer services	12,437	13,058

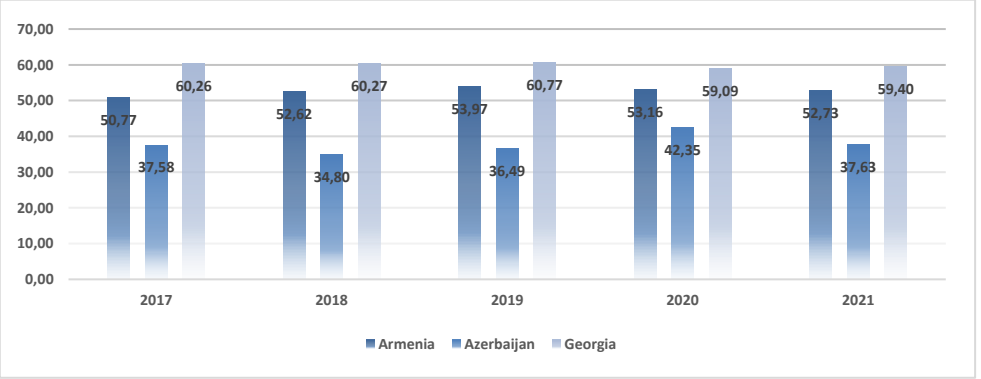
Armenia	Construction	178,142	77,693
	Distribution/Repair	3,259	3,099
	Storage	273,749	239,758
	Commercial services	2,385,219	1,076,458
	Visual and Audiovisual services	4.460	3.520
	Travel	1,527,968	289,888
	Manufacturing services	27,236	37,472
	Telecommunication	19,728	14,651
	Insurance and Retirement services	31,483	29,282
	Financial services	19,033	19,128
	Other personal, cultural and entertainment services	14,860	6,820
	R&D services	-	-
	Information services	19,855	15,952
	Computer services	222,092	297,850
Georgia	Construction	5,065	7,201
	Distribution/Repair	98	-
	Storage	1,006,723	698,006
	Commercial services	4,509,691	1,503,415
	Intellectual Property Utility services	928	995
	Visual and Audiovisual services	5,281	5,665
	Travel	3,268,654	541,687
	Manufacturing services	14,067	2,763
	Telecommunication	46,271	39,664
	Insurance and Retirement services	12,019	12,556
	Financial services	23,539	21,323
	Other personal, cultural and entertainment services	14,930	18,978
	R&D services	980	2,898
	Information services	4,933	6,591
	Computer services	62,594	67,941

Resource: (ICT, 2022; UNCTAD, 2022; WTO, 2022) trade in services database.

The main driver of economic growth has long been explored in the economics literature. In this context, in 2019, transportation and travel services exports across all South Caucasus Countries were higher than export figures of other service industries. In 2020, the growth in computer services, especially in Armenia (298 billion USD), was significantly notable in addition to transport and travel services. Strong transportation infrastructure in Azerbaijan, a logistic corridor between Asia and Europe, allowed increasing trade flow between the continents which is reflected in the transportation services of Azerbaijan. In 2019, whereas the highest export figure was seen with the service export industry, travel services were regarded as one of the substantial sectors that grew beside the oil industry and were believed to contribute significantly to Azerbaijan's welfare. In 2020, the total service export was 1 billion USD in Armenia. Whereas logistics services constituted 21% of overall service export, travel services comprised 26.5%, and communication and computer services represented 14.6% (Knoema, 2020). In 2019, it was seen that transportation services export was 1.007 billion USD, whereas Georgia's travel services export was 3.269 billion USD. In 2020, a significant decrease occurred in both service industry exports.

The services industry emerged as the largest segment and driving power of the South Caucasus Countries' economy by contributing to trade, employment and GDP. Today, the service economy constitutes more than half of overall employment and value-added for most countries (Rubalcaba, 2013: 2). Employed data was collected from reliable domestic and international resources for the study's objectives. Graph 2 illustrates the value added created by the service industry within the economy in the light of data acquired from the World Bank:

Graph: 2
Share of Service Industry in Value Added (Services, value added (% of GDP)



Resource: WDB, 2022.

According to Graph 2, it is seen that the added value of the service sector in Azerbaijan, which constituted 37.58% of the GDP in 2016, increased to 42% in 2020 and decreased to 37.63% in 2021. Similarly, it is observed that the value added of the service sector in Armenia rose from 50% in 2016 to 53% in 2020 and decreased to 52.73% in 2021, while the value added of the service sector, which was 61.5% in 2016 in Georgia, is 2020 It is seen that it decreased to 59% in Turkey and increased to 59.60% in 2021 with a slight increase.

Within the scope of the service trade across the South Caucasus Countries, the present study could be regarded as a fore step to evaluate the effect of service export, one of the main constituents of the growth strategies of developing countries, on economic growth because of the scarcity of the studies available on this subject in the current literature.

2. Literature Review

2.1. Theoretical Literature Review

Since Adam Smith's (1776: 214) research on the nature and reasons for the wealth of nations, an answer to why countries and individual commercial businesses have been indulging in international trade has been searched for in several theories within the relevant literature. The answer to this question is that countries are required to export goods and services to generate income (Kaliappan et al., 2017: 393). Since service export perceived as a new growth driver for countries in our contemporary period provides substantial input for the diversity of sectors, this situation could proliferate extensive portions of the economy (Hoekman & Mattoo, 2012: 9); thus, it could be regarded as the growth engine of country economy (Mishra et al., 2011: 2; UNCTAD, 2004: 15; Yusuf, 2015: 602). Trade of services which could be dated back to the studies of Adam Smith, David Ricardo and Karl Marx, who considered services differently than goods, has long been at the centre of interest

(Mishra et al., 2011: 4). It is suggested that although services display different characteristics than goods, factor lying beneath trades of goods exist for services as well (Kimura & Lee, 2006: 92). To support this view, it is reported that some activities traded by countries under service classification similar to goods possess comparative superiority developed by Ricardo (Nhớ & Hương, 2014: 54).

The growth theory emerged with the neoclassical growth model introduced by Solow (1956: 66), which relied on the complete utility of labour and capital. According to Solow, growth occurs when population, capital accumulation and technology come together. Romer (1990: 72) and Lucas (1988: 19) developed an endogenous growth theory of the mathematical explanation of human capital and technological advancement. The service industry plays a significant role in human capital, and hu and capital are effective in economic growth in Lucas's model. Moreover, Feder (1983: 59) suggests export-based growth theory, which asserts that the fundamental cause of economic growth is export.

2.2. Empirical Literature

Since the beginning of the 1980s, various studies have applied comparative superiority theory to service trade. In the precursor study of Sapir and Lutz (1980: 5), determinants of comparative superiority models of service trade are oriented; and comparative advantage of the transportation services are reported as capital intensity, scale, the composition of trade and distance. Hindley and Smith (1984: 370) claim in their study that standard comparative superiority based on Hecksher-Ohlin (H-O) framework and product-specialization concepts could also be applied to service trade. Melvin (1989: 1181) asserts that the comparative superiority principle and Heckscher-Ohlin (H-O) theory must be interpreted differently about their practice with services. The significance of service in GDP growth, increasing share of service in trade and transformation in service have motivated researchers to do further studies on it from different angles. The importance of services in growth Mattoo et al. (2008) also found that financial and telecommunication services are the driving force of long-term economic growth. Outsourcing of services plays an important role in GDP growth (Mishra et al. 2011: 4). Fixler and Siegel (1999: 177) studied the effects of outsourcing on output and productivity increase in service industries were examined, and it was concluded that outsourcing reduced service sector productivity in the short run.

Although service export is a substantial impulsive power of economic growth, there need to be more studies on its effect on economic growth. Furthermore, the number of such studies has increased recently owing to rising awareness and interest among researchers and policymakers about the view that service trade liberalisation is related to higher economic growth. Available studies usually depend on the Export-based Growth (EBG) hypothesis supported by Adam Smith and David Ricardo. Gabriele (2006a: 294) reports that service export positively affects GDP growth among developing countries in the long term, but this effect needs to be stronger among developed countries. Priyankara (2018: 479) analyses the

relationship between service export and GDP in Sri Lanka; and indicates the existence of one-way causality from service export to economic growth.

Mishra et al. (2011: 24) conclude in their study that service export complexity is substantial for the growth of per capita GDP, and it is a strong growth estimator for low- and middle-income countries. Similarly, Alege and Ogundipe (2015: 364) report that both service export and import enhance economic development, whereas Sermcheep (2019: 163) asserts that both modern and conventional service export contributes to the GDP growth in his study on Asian countries. Davtyan (2015: 12) analyses the effect of tourism on economic development in Armenia and concludes that tourism plays a key role in economic development. In the same way, Kaliappan et al. (2017: 393) considered the correlation between service export and growth for some Asian countries. They determined that service export significantly and positively affects economic growth. Ahmad et al. (2017: 113) study, the determinants of service exports in developing Asian countries were examined, and it was concluded that the value added of the exchange rate, foreign income, foreign direct investment (FDI), services and communication opportunities were the determinants of service exports.

3. Data and Methodology

Our study aimed to answer the question of "Is there any correlation between service export and economic growth?" for three Southern Caucasian Countries. In this section, the data set and methodology were introduced. The ADF unit root test was employed to determine stationarity. Toda *et al.* (1995: 227-245)'s causality test was preferred to Granger's because it is a relatively novel method.

3.1. Dataset

The data set utilised during the analysis was acquired from the World Bank (2022) statistical database. Macroeconomic variables, namely per capita GDP, service export, gross capital, and labour, were employed as time series covering the period of 1991-2020 in line with the objective of our model. Providing adequate observations, missing data was completed through interpolation and extrapolation. Variables included in the model were determined according to the theoretical and empirical literature. Per capita GDP, commonly used in empirical and theoretical growth literature, was estimated based on the 2015 US$ currency rate and included in the model as a dependent variable of *Y*. Investment, in other words, capital (*K*), frequently emphasised by the neoclassical and endogenous growth models, is regarded as one of the fundamental determinants of economic growth (Levine & Renelt, 1992: 945; Mankiw et al., 1990: 20). Variable of investment was included in the model by estimating the ratio of gross capital accumulation to GDP. Variable of labour, facilitating the adoption of products and ideas in most countries (Nelson & Phelps, 1966: 71), was included in the model as *L*, which refers to the ratio of the labour force to the total population.

Table: 2
Variable Table

	Variable	Description of Variable	Resource
Dependent variable	GDP Per Capita [2]	Y	World Bank
Control variable	Investment[3]	K	World Bank
	Size of the labour force[4]	L	World Bank
Relevant variable	Services Exports [5]	SE	World Bank

Resource: WDI, 2022.

3.2. Methodology

The stationarity of the series was analysed by Augmented Dickey-Fuller (ADF) (Dickey & Fuller 1981) unit root test. In the analysis of non-stationary time series, spurious regression issues could occur (Granger & Newbold, 1974: 111). This could cause false positive correlation results among variables even though no coefficient existed, or coefficients could be misinterpreted. Accordingly, Augmented Dickey-Fuller (ADF) test was implemented during our analysis to test the stationarity of the variables. In the next step, there was a need for maximum integration order, "m_{max}", obtained from the unit root test to implement the causality test. To reveal any causality relationship between service export and economic growth, it is required to show that they are co-integrated. In the case of more than two variables, multiple long-term equilibrium relationships could be determined. In this case, Johansen-co-integration (Johansen, 1988: 232-253) and (Johansen & Juselius, 1990: 170-209) methods were implemented. In the first phase of the co-integration test, the adequate number of lag-length is determined for stationary series at the same level. The VAR model is first structured to determine adequate lag length, and Akaike and Schwarz information criterion is utilised to determine the number of lags. The estimator model yielding minimum AIC and SBC would be selected for optimal lag length, and this lag length would be denominated by *p*.

The Toda-Yamamoto causality test (CT) was utilised in our study. If an *X* variable could yield a better estimation of variable *Y* by using all available information, it could be said that there is causality existed from *X* to *Y* (Granger, 1969: 424-438). On the other hand, Toda *et al*. (1995: 227-245) indicate how to estimate VAR models constructed at various levels and how to test restrictions that may occur with parameter matrixes even though series are integrative or co-integrative at different levels.

To implement this test, at first, maximum integration levels "m_{max}" of variables are determined by using unit root tests. The adequate lag length, referred to as *p* for the VAR model, was determined using information criteria. Then, the $p+m_{max}$ lagged VAR model was estimated. To check whether the coefficients were statistically different from zero, an

[2] *GDP Per Capita (Constant 2015 US$)*
[3] *Gross fixed capital formation (% of GDP)*
[4] *Total Labour Force/Total Population*
[5] *Services exports % GDP*

asymptotic chi-square distributed Wald test was conducted; and the direction of causality was determined.

The VAR model could be structured as below to estimate the CT procedure for variables of *GDP, K, L,* and *SE*:

$$logK_t = \alpha_0 + \sum_{i=1}^{p} \beta_{1i}\, logK_{t-i} + \sum_{j=p+1}^{m_{max}} \beta_{2j}\, logK_{t-j} + \sum_{i=1}^{p} Y_{1i} logGDP_{t-i} + \sum_{j=p+1}^{m_{max}} Y_{2j}\, logGDP_{t-j} + \sum_{i=1}^{p} \delta_{1i} logL_{t-i} \sum_{j=p+1}^{m_{max}} \delta_{2j}\, logL_{t-j} + \sum_{i=1}^{p} \varphi_{1i} logSE_{t-i} \sum_{j=p+1}^{m_{max}} \varphi_{2j}\, logSE_{t-j} + u_{1t} \quad (1)$$

$$logL_t = \alpha_1 + \sum_{i=1}^{p} \theta_{1i}\, logK_{t-i} + \sum_{j=p+1}^{m_{max}} \theta_{2j}\, logK_{t-j} + \sum_{i=1}^{p} \mu_{1i} logGDP_{t-i} + \sum_{j=p+1}^{m_{max}} \mu_{2j}\, logGDP_{t-j} + \sum_{i=1}^{p} \pi_{1i} logL_{t-i} \sum_{j=p+1}^{m_{max}} \pi_{2j}\, logL_{t-j} + \sum_{i=1}^{p} \vartheta_{1i} logSE_{t-i} \sum_{j=p+1}^{m_{max}} \vartheta_{2j}\, logSE_{t-j} + u_{2t} \quad (2)$$

$$logY_t = \alpha_2 + \sum_{i=1}^{p} \omega_{1i}\, logK_{t-i} + \sum_{j=p+1}^{m_{max}} \omega_{2j}\, logK_{t-j} + \sum_{i=1}^{p} \rho_{1i} logGDP_{t-i} + \sum_{j=p+1}^{m_{max}} \rho_{2j}\, logGDP_{t-j} + \sum_{i=1}^{p} \sigma_{1i} logL_{t-i} \sum_{j=p+1}^{m_{max}} \sigma_{2j}\, logL_{t-j} + \sum_{i=1}^{p} \epsilon_{1i} logSE_{t-i} \sum_{j=p+1}^{m_{max}} \epsilon_{2j}\, logSE_{t-j} + u_{3t} \quad (3)$$

$$logSE_t = \alpha_3 + \sum_{i=1}^{p} b_{1i}\, logK_{t-i} + \sum_{j=p+1}^{m_{max}} b_{2j}\, logK_{t-j} + \sum_{i=1}^{p} c_{1i} logGDP_{t-i} + \sum_{j=p+1}^{m_{max}} c_{2j}\, logGDP_{t-j} + \sum_{i=1}^{p} d_{1i} logL_{t-i} \sum_{j=p+1}^{m_{max}} d_{2j}\, logL_{t-j} + \sum_{i=1}^{p} f_{1i} logSE_{t-i} \sum_{j=p+1}^{m_{max}} f_{2j}\, logSE_{t-j} + u_{1t} \quad (4)$$

Where p refers to optimum Lag Length, m_{max} refers to maximum integration sequence, and *u* is the white noise term. Determining the direction of causality, for example, with Equation (1), the null hypothesis asserting "GDP causes Granger-*K*" was tested by the Wald test. The results indicated that the alternative hypothesis asserting that "GDP does not cause Granger-K" would be accepted if the null hypothesis was refused. Causal relationships among other variables were tested in the same way.

4. Results

This section presents results from the unit root and causality tests for each of the three countries. Different causal correlations were determined fundamentally.

4.1. Results for Armenia

Regarding the ADF unit root test results exhibited in Table 3, the unit root hypothesis was refused at a % significance level in their first differences for the *OIL* and *GDP* variables for both equations with coefficient and with coefficient and trend. For the Equation with coefficient and the one with both coefficient and trend, when USD was applied to test during the second difference, it became stationary at a 1% significance level.

Table: 3
Unit Root Test Results

	ADF (Constant)			ADF (Constant and trend)		
		$1^{st}\ dif.$	$2^{nd}\ dif.$	Level	$1^{st}\ dif.$	$2^{nd}\ dif.$
LogGDP	-0.167618	-8.223302***	-	-3.707834**	-8.063063***	-
LogK	-1.669884	-5.624393***	-	-1.133187	-5.711078	-
LogL	-2.542605	-0.372413	-8.439972***	-1.728801	-0.727061	-8.889217***
LogSE	-2.350322	-3.194044**	-	-0.808792	-3.604438**	-

**** and * represent significance at 1% and 10%, respectively. Schwarz Information Criteria choose the lag length for the ADF test.*

The stationarity of our series was determined as *I(1)* and *I(2)*. Considering all these findings, the maximum integration order was estimated as m_{max}=2; accordingly, it was decided that the additional lag length needed to be included in the estimated VAR model was two. The maximum lag length was determined by relying on regular information criterions such as AIC and SIC.

Table: 4
Determination of Lag-Length

Lag	LR	FPE	AIC	SC	HQ
0	0	7.720196	NA	9.01e-06	-0.265728
1	1	151.1119	235.5721	1.02e-09	-9.365135
2	2	177.7472	36.14793*	5.18e-10*	-10.12480*

** Indicates lag order selected by the criterion; LR: sequentially modified LR test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion.*

Using various information criteria, the optimum Lag Length was determined as p=2 for the estimated VAR model. The estimated VAR (2) model was found to be stationary (see: Figure 1); the series were uncorrelated and homoscedastic (see: Table 15).

To Granger causality, the procedure was pursued by Toda and Yamamoto (1995: 227-245). During the causality analysis, the lag length of the endogenous variable was determined as (m+p), a total of the values mentioned in the beginning.

Table: 5
Granger Causality Test Results

H_0	χ^2	Prob.	Decision
LOGL doesn't Granger-cause LOGY	0.185	0.911	logL ··· logY
LOGK doesn't Granger-cause LOGY	0.671	0.715	logK ··· logY
LOGSE doesn't Granger-cause LOGY	0.212	0.899	logSE ··· logY
All don't Granger-cause LOGY	2.269	0.893	All ··· logY
LOGY doesn't Granger-cause LOGL	46.617	0.000	logY → logL
LOGK doesn't Granger-cause LOGL	6.645	0.036	logK → logL
LOGSE doesn't Granger-cause LOGL	0.543	0.762	logSE ··· logL
All don't Granger-cause LOGL	65.475	0.000	All → logL
LOGY doesn't Granger-cause LOGSE	0.364	0.833	logY ··· logSE
LOGL doesn't Granger-cause LOGSE	6.456	0.039	logL → logSE
LOGK doesn't Granger-cause LOGSE	0.210	0.900	logK ··· logSE
All don't Granger-cause LOGSE	8.316	0.215	All ··· logSE
LOGY doesn't Granger-cause LOGK	2.847	0.240	logY ··· logK
LOGL doesn't Granger-cause LOGK	1.953	0.376	logL ··· logK
LOGSE doesn't Granger-cause LOGK	0.339	0.843	logSE ··· logK
All don't Granger-cause LOGK	7.483	0.278	All ··· logK
A → B means causality runs from A to B. A ··· B means no causality between A and B			

For the CT causality test, the VAR (4) model was estimated with a lag length of p+m_{max}=4; and the Wald test with p=2 was conducted.

According to Table 5, in cases when growth was the dependent variable in Armenia, it was seen that there was no causality from labour, gross capital and service export to economic growth; and there was no causality from all variables toward growth. When the dependent variable was labour, it was determined that there was causality from growth and gross capital toward labour; service export was not causality for labour, and the causality relationship was determined from all variables toward labour. In the model in which the only dependent variable was service export, it was determined that there was no causality from service export to growth and gross capital, but there was causality from labour to service export. In the meantime, there was no causality from all variables to service export. In case our dependent variable was gross capital, it was seen that there was no causality from growth, labour, and service export toward gross capital, and similarly, no causality was found from all variables toward the capital. Regarding the results in Table 5, "K Granger does not cause Y" and "Y Granger does not cause K". The null hypothesis was refused at a 1% significance level. Whereas "L Granger does not cause Y, Y Granger causes L". Whereas "L Granger causes SE" "SE Grange causes L". "K Granger causes SE; SE Granger does not cause K". "L Granger causes SE; SE Granger does not cause L". "Y Granger causes SE; SE Granger does not cause Y". For Armenia, one-way causality was determined from growth toward labour and from labour to service export.

4.2. Results for Azerbaijan

Table: 6
Unit Root Test Results

	ADF (Constant)			ADF (Constant and trend)		
		$1^{st}\ dif.$	$2^{nd}\ dif.$	Level	$1^{st}\ dif.$	$2^{nd}\ dif.$
LogGDP	-2.575601	-2.395806	-3.309146***	-2.646596	-2.776975	-3.871354***
LogK	-3.255286	-3.284662***	-	-2.603663	-3.218980	-5.545263***
LogL	-1.256272	-0.645708	-2.010133	-2.645125	-0.975326	-1.760355*
LogSE	-0.947155	-3.890265***	-	-1.298401	-3.801854**	-

**** and * represent significance at 1% and 10%, respectively. Schwarz Information Criteria choose the lag length for the ADF test.*

Stationarity levels of our series were determined at *I(1)* and *I(2).* Accordingly, the Stationarity level for the analysis was determined as two.

Table: 7
Determination of Lag Length

Lag	LR	FPE	AIC	SC	HQ
0	53.31428	NA	3.47e-07	-3.522448	-3.332133
1	130.7528	127.2205	4.38e-09	-7.910917	-6.959342
2	177.6307	63.62000*	5.22e-10*	-10.11648*	-8.403646*

The optimum lag length was determined as p=2 for the VAR model. The estimated VAR (2) model was stationary (see: Figure 2), uncorrelated as a series and homoscedastic (see: Table 15).

Table: 8
Granger Causality Test Results

H_0	χ^2	Prob.	Decision
LOGK doesn't Granger-cause LOGY	0.563	0.754	loK ··· logY
LOGL doesn't Granger-cause LOGY	10.915	0.004	logL → logY
LOGSE doesn't Granger-cause LOGY	3.579	0.167	logSE ··· logY
All don't Granger-cause LOGY	22.298	0.001	All → logY
LOGY doesn't Granger-cause LOGK	1.889	0.388	logY ··· logK
LOGL doesn't Granger-cause LOGK	14.281	0.000	logL → logK
LOGSE doesn't Granger-cause LOGK	8.445	0.014	logSE →logK
All don't Granger-cause LOGL	24.086	0.000	All → logK
LOGY doesn't Granger-cause LOGL	1.238	0.538	logY ··· logL
LOGK doesn't Granger-cause LOGL	1.261	0.532	logL ··· logL
LOGSE doesn't Granger-cause LOGL	2.937	0.230	logK ··· logL
All don't Granger-cause LOGL	3.634	0.725	All ··· logL
LOGY doesn't Granger-cause LOGSE	0.275	0.871	logY ··· logSE
LOGL doesn't Granger-cause LOGSE	2.625	0.269	logL ··· logSE
LOGK doesn't Granger-cause LOSE	1.647	0.438	logSE ··· logSE
All don't Granger-cause LOGSE	10.848	0.093	All ··· logSE
A → B means causality runs from A to B. A ··· B means no causality between A and B			

To conduct the CT causality test, VAR (4) model with p+m_{max}=4 lag length was estimated, and the Wald test with p=2 lag length was conducted.

In the model in which the dependent variable was growth, it was seen that there was causality from labour to growth, whereas there was no causality from service export and gross capital toward growth; however, there was causality from all variables at the same time. In the model in which the dependent variable was gross capital, it was seen that there was causality from labour and service export toward gross capital, whereas there was no causality from growth to gross capital; however, there was causality from all variables to gross capital. In the model in which the dependent variable was labour, it was seen that there was no causality from growth, service export, and gross capital to labour and, similarly, no causality from all variables to labour. Finally, in the model in which the dependent variable was service export, it was seen that there was no causality from growth, labour and capital to service export, even though there was causality from all variables toward service export at a 10% significance level. According to the results exhibited in Table 8, it was concluded that "K Granger did not cause Y" and "Y Granger did not cause K". The null hypothesis was refused at a 1% significance level. "Whereas L Granger caused Y, Y Granger did not cause L". "Whereas L Granger did not cause SE; SE Granger did not cause L". "Whereas K Granger did not cause SE, SE Granger caused K". "L Granger did not cause SE; SE Granger did not cause L". "Y Granger did not cause SE; SE Granger did not cause Y". It was determined with Azerbaijan that there was one-way causality from labour to growth, and from service export to gross capital.

4.3. Results for Georgia

Table: 9
Unit Root Test Results

ADF (Constant)				ADF (Constant and trend)		
		$1^{st}\ dif.$	$2^{nd}\ dif.$	Level	$1^{st}\ dif.$	$2^{nd}\ dif.$
LogGDP	-0.295675	-7.817898***	-	-0.295675	-9.707107***	-
LogK	-1.979967	-4.229695***	-	-2.364815	-4.143810	-
LogL	-2.431873	-2.599761	-	-2.675360	-4.994660***	-
LogSE	-0.947155	-3.890265***	-	-1.298401	-3.801854**	-

**** and * represent significance at 1% and 10%, respectively. Schwarz Information Criteria choose the lag length for the ADF test.*

It was determined that the stationarity of our series was at the *I(1)* level. Consequently, the stationarity degree was determined as one for analysis. It could be stated as m=1.

Table: 10
Estimation of Lag Length

Lag	LR	FPE	AIC	SC	HQ
0	9.782107	NA	7.66e-06	-0.428304	-0.236328
1	124.1866	186.4369	5.32e-09	-7.717522	-6.757643
2	153.8735	39.58257	2.11e-09	-8.731369	-7.003586
3	181.3623	28.50695*	1.15e-09*	-9.582394*	-7.086708*

The optimum Lag Length was estimated as p=3 for the VAR model. The forecasted VAR (2) model was stationary (see: Figure 3), uncorrelated as a series, and homoscedastic (see: Table 15).

Table: 11
Johansen Co-Integration Test

Hypothesised No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
r=0 *	0.794379	94.65905	47.85613	0.0000
At most, 1 *	0.691966	53.53433	29.79707	0.0000
At most, 2*	0.450617	22.91820	15.49471	0.0032
At most, 3*	0.246111	7.345256	3.841466	0.0067
*Trace test indicates 4 cointegrating eqn(s) at the 0.05 level; * Denotes rejection of the hypothesis at the 0.05 level; **MacKinnon-Haug-Michelis (1999) p-values.*				
Hypothesised No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical Value**	**Prob.****
r=0*	0.794379	41.12472	27.58434	0.0005
At most, 1 *	0.691966	30.61613	21.13162	0.0017
At most 2	0.450617	15.57294	14.26460	0.0309
At most 3	0.246111	7.345256	3.841466	0.0067
*Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level; * Denotes rejection of the hypothesis at the 0.05 level; **MacKinnon-Haug-Michelis (1999) p-values.*				

The eigenvalue is a test based on Eigenvector values. Series are required to be stationary at the same degree to implement the co-integration test. Table 11 exhibits the Johansen Co-Integration test results. Hence, a long-term correlation was determined between the variables according to both the path test and maximum Eigenvalue test results. Obtained results from both tests suggested long-term correlation at a 5%-significance level. Estimated test results for the null hypothesis (r=0), which suggested no co-integration

existed among variables, were greater than the critical values. Therefore, the null hypothesis was refused.

Table: 12
Granger Causality Test Results

H_0	χ^2	Prob.	Decision
LOGSE doesn't Granger-cause LOGY	0.088	0.993	loSE ···logY
LOGL doesn't Granger-cause LOGY	5.843	0.119	logL··· logY
LOGK doesn't Granger-cause LOGY	1.214	0.749	logK ···logY
All don't Granger-cause LOGY	8.560	0.478	All ··· logY
LOGY doesn't Granger-cause LOGSE	22.749	0.000	logY→logSE
LOGL doesn't Granger-cause LOGSE	20.910	0.000	logL→logSE
LOGK doesn't Granger-cause LOGSE	22.325	0.000	logK →logSE
All don't Granger-cause LOGL	120.641	0.001	All → logSE
LOGY doesn't Granger-cause LOGL	3.828	0.280	logY··· logL
LOGSE doesn't Granger-cause LOGL	6.280	0.098	logSE→logL
LOGK doesn't Granger-cause LOGL	3.259	0.353	logK ··· logL
All don't Granger-cause LOGL	10.321	0.325	All ···logL
LOGY doesn't Granger-cause LOGK	14.421	0.002	logY→logK
LOGSE doesn't Granger-cause LOGK	7.090	0.069	logL→ logK
LOGL doesn't Granger-cause LOGK	0.162	0.983	logSE ···logK
All don't Granger-cause LOGSE	21.434	0.010	All →logK
A → B means causality runs from A to B. A ··· B means no causality between A and B			

To conduct the CT causality test, the VAR (4) model with a lag length of p+m_{max}=4 was estimated, and the Wald test with a lag length of p=3 was implemented.

In the precursor model in which the dependent variable was growth, it was seen that there was no causality from service export, labour, gross capital, and a combination of all variables toward growth. In the second model in which the dependent variable was service export, there was causality from growth, labour, and gross capital toward service export; and causality from a combination of all variables to service export. In the model in which the dependent variable was labour, it was seen that there was no causality from growth and gross capital toward growth, whereas a causality existed from service export toward growth at a 10% significance level. Similarly, this model determined no causality from the combination of all variables toward labour. Finally, the dependent variable in the model was gross capital; causality was determined from growth and service export toward gross capital; no causality existed from labour to gross capital. That is, based on the results exhibited in Table 12, it was determined that "SE Granger did not cause Y", "Y Granger caused SE", and "L Granger did not cause Y, whereas Y did not cause Granger L". Therefore, the null hypothesis was refused at a 1% significance level. Furthermore, "whereas K Granger did not cause Y, Y Granger caused K". K Granger caused SE whereas SE Granger caused K. L Granger caused SE whereas SE Granger caused L. Considering Georgia, it was concluded that there was one-way causality from growth to service export and from service export to gross capital. Moreover, two-way causality was determined from labour to service export and service export to labour.

5. Conclusion

Service export, perceived as a means to contribute to economic and social development in developing countries, has become the primary goal of almost all countries, including Caucasians, recently. When the literature is examined, it is seen that the studies on the effect of service exports on growth are generally grouped studies (Alege & Ogundipe, 2015: 364; Gabriele, 2006b: 315; Li et al., 2003: 12; Nordås, 2010: 496). Considering that the effect of service exports on economic growth may vary between countries, few studies have examined this effect using single-country data (Davtyan, 2015: 12; Eichengreen & Gupta, 201: 2; Mintina, 2017: 38). In our study, the relationship between service exports and growth has been discussed with three separate analyses using data from three different countries. The present study's causality test developed by Toda et al. (1995: 245) was utilised to explore the potential causalities between service export and growth. Our findings stressed important points for policymakers of concerned countries. Above all, it was determined with Georgia that there was one-way causality from growth to service export. This finding suggested that service export was sensitive to growth. Economic growth played a motivating role in service export in Georgia. Growth would allow greater service export, whereas service export would increase total exports of sectors, and these would trigger economic growth through export increase. According to the analysis results, no causality relationship was determined between service export and growth for Azerbaijan and Armenia. The result that there is no causal relationship between service exports and economic growth (Aigheyisi, 2020: 25) supports the findings of this study. This finding would be assessed for Armenia and Azerbaijan as that overall export was not an important determinant for the export of the service sector. For example, almost half of the workforce in Armenia is employed in the service sector. In recent years, serious progress has been made in the service sector in Azerbaijan, along with other fields. New hospitals, health centres, schools, kindergartens, hotels, and recreational facilities have been built in the regions is the best indicator of this.

Although there is an advanced level of development in the service sector, it is possible to say that service exports play an active role in the growth of the country in Georgia, but in Armenia and Azerbaijan, one of the world's leading oil producers, service exports do not have an important role in the growth of the country yet.

As mentioned earlier, Azerbaijan successfully implemented its petrol strategy, expanding its export volume. Today, Azerbaijan's fundamental priority is to diversify manufacturing and export in the developing non-oil sectors. In this regard, several strategies and policies have been followed in Azerbaijan. However, the share of crude oil and oil derivatives in the overall export is still high. Azerbaijan's export has gained increased, but diversification of export goods and services are important. One way to increase and diversify overall export is to increase service export. Additionally, Armenia specialises in modern service businesses, but these services are not yet exportable. Considering global economic trends, it is obvious that service export will gain further significance for economic growth in the near future. Even though oil product exports have currently of substantial importance

for Azerbaijan, it is expected that the share and weight of the service sector in the export of both Azerbaijan and Armenia will increase over time. For further studies, real values of variables could be employed, the data set could be expanded, and structural breaks could be considered.

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APPENDIX

Table: 13
Summary Statistics

	Variable	Obs	Mean	Std. Dev.	Min	Max
	Time	30	2005.5	8.803408	1991	2020
	Country	0				
Armenia	GDP	30	2395.677	1168.702	813.8298	4350.466
	K	30	24.45102	9.836949	12.4554	46.83332
	L	30	.41696	.0270399	.3896332	.4676295
	SE	30	2.41e+07	1.77e+07	1556008	5.59e+07
	Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
	Time	30	2005.5	8.803408	1991	2020
	Country	0				
Azerbaijan	GDP	30	3390.442	1788.427	1120.247	5508.409
	K	30	26.75934	10.06219	11.4521	57.71025
	L	30	.5100751	.0151389	.482848	.5348645
	SE	30	1.81e+09	1.78e+09	1.49e+08	4.81e+09
	Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
	Time	30	2005.5	8.803408	1991	2020
	Country	0				
Georgia	GDP	30	2653.482	1210.017	969.7129	4773.423
	K	30	21.1961	7.047507	2.64657	28.78693
	L	30	.5302043	.0164458	.5025451	.5612389
	SE	30	1.31e+09	1.54e+09	-8.06e+08	4.60e+09

Table 14
Correlation Matrix

Armenia						
	time	gdp	k1	lf	serex	goex
time	1.0000					
GDP	0.9675	1.0000				
K	0.1040	0.2232	1.0000			
L	0.7087	0.7353	0.2320	1.0000		
SE	0.9382	0.9314	0.0359	0.8196	1.0000	
Azerbaijan						
time	1.0000					
GDP	0.8850	1.0000				
K	-0.0817	-0.3540	1.0000			
L	-0.4605	-0.7062	0.2426	1.0000		
SE	0.8849	0.9030	-0.2611	0.8849	1.0000	
Georgia						
time	1.0000					
GDP	0.9276					
K	0.4539	0.3956	1.0000			
L	0.2745	0.2521	-0.2827	1.0000		
SE	0.9205	0.8980	0.3623	0.9205	1.0000	

Figure: 1
Inverse Roots of AR Characteristic Polynomial (Armenia)

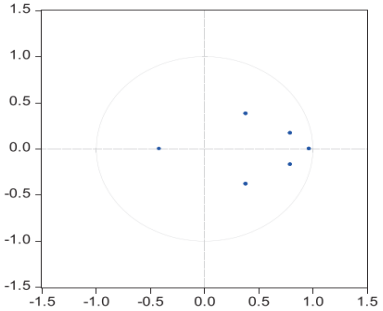

Figure: 2
Inverse Roots of AR Characteristic Polynomial (Azerbaijan)

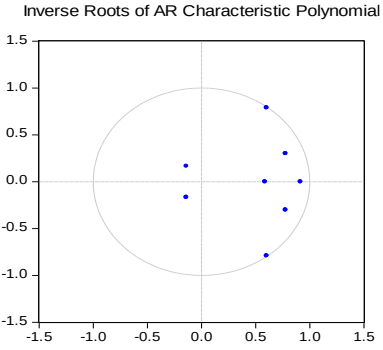

Figure: 3
Inverse Roots of AR Characteristic Polynomial (Georgia)

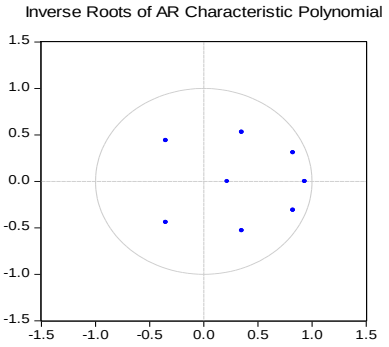

Table: 15
VAR Residual Serial Correlation LM and VAR Residual Heteroscedasticity Tests

VAR Residual Serial Correlation LM Tests **(Armenia)**		
Lags	LM-Stat	Prob
1	32.72484	0.0080
2	19.26573	0.2551
3	22.06815	0.1410
VAR Residual Heteroscedasticity Test **(Armenia)**		
	Chi-sq	Prob.
	177.4466	0.1638
VAR Residual Serial Correlation LM Tests **(Azerbaijan)**		
Lags	LM-Stat	Prob
1	22.93640	0.1154
2	20.10148	0.2157
3	19.25406	0.2557
VAR Residual Heteroscedasticity Test **(Azerbaijan)**		
	Chi-sq	Prob.
	180.1685	0.1313
VAR Residual Serial Correlation LM Tests **(Georgia)**		
Lags	LM-Stat	Prob
1	18.24987	0.3095
2	20.99953	0.1785
3	14.03087	0.5964
VAR Residual Heteroscedasticity Test **(Georgia)**		
	Chi-sq	Prob.
	241.4478	0.4616