Research Paper

The Causal Relationship Among Trade Openness, Foreign Direct Investment And Economic Growth: Evidence From The Republic Of North Macedonia

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ABSTRACT: *The aim of the study is to examine the causal relationship among trade openness, foreign direct investment and economic growth in the Republic of North Macedonia for the period from 2000 to 2021, both in the short run andlong run.For this purpose, panel dataset was collected from the World Development Indicators to evaluate the relationship among trade openness, foreign direct investment and economic growth in the Republic of North Macedonia for the period 2000-2021. The econometric methodology employed unit root tests, the co-integration test, the Granger causality test and the Vector Autoregressive Model. The results from the Johansen co-integration test found that there is no co-integration relationship between variables in the long run. The study shows unidirectional causal relationship from economic growth to trade openness in the short run. The effect of foreign direct investment on economic growth is not statistically significant. Therefore, the results indicate that combined causality exists among the examined variables in the study. According to the conducted research, it is necessary to take significant measures to improve trade openness in the direction of encouraging exports and the inflow of FDI, by creating a solid basis for running a business that will affect the accelerated growth of output in the Republic of North Macedonia.*
KEYWORDS*: Trade openness, Foreign direct investment, Economic growth, Granger causality, Republic of North Macedonia*

I. INTRODUCTION

One of the most important indicators of the successful development strategy of countries in the world is economic growth, which implies a constant increase in the market value of goods and services. Economic growth includes the processes of progress and creation of future "directions" for the realization of well-being in a particular country.

As a result of the process of dynamic economic integration between countries in the world, an increased impact of exports and foreign direct investments (FDI) on economic growth was observed. Namely, the generally accepted argument is that the openness of an economy encourages economic growth, regardless of the level of development of a country. Accordingly, the issue of the relationship between exports, FDI and economic growth has attracted much attention and interest among economists and policy makers for the development of countries worldwide.

Foreign direct investment (FDI) is a form of movement of capital from one country to another by which the exporter of the capital acquires a share of over 10% in the ownership of the foreign company.The inflow of funds through foreign direct investments is not only an inflow of capital, but also a basis for increasing trade flows, economic growth and development, and creating new jobs.

In addition to FDI, foreign trade is also considered a significant indicator of economic growth. Most arguments in favour of an export-led growth strategy emphasize the role of trade openness. Unlike countries characterized by less trade openness, countries with greater participation in international trade achieve faster economic growth in the long-run. Therefore, a deeper development gap has been recorded between countries that apply import substitution and economic protectionism.On the other hand, countries that strive to reduce the gap caused by imposed barriers face a relatively difficult and complex task.

Endogenous growth theory from the 1980s held that technological progress and FDI have persistent growth effects in the host country through technology transfer and spillover. In an increasingly globalized

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economy, FDI and international trade, particularly through exports and imports, enhance competition in international markets and technology transfer and thus promote economic growth. Conversely, economic growth has a significant impact on trade as well. The expansion of exports ensures the realization of greater economies of scale, productivity and removes foreign exchange restrictions, thereby enabling increased access to international markets. On the other hand, FDI can provide a greater pool of knowledge and technology transfer and increase job opportunities thus boosting overall growth in the host country.

The aim of this study is to investigate the causal relationship among foreign direct investment, trade openness and economic growth in the Republic of North Macedonia from 2000 to 2021 using co-integration and Granger-causality test in Vector Autoregressive Model (VAR). First, the procedure is applied to examine the stationarity of the underlying time series described in the paper. Then, the Johansen co-integration test is used, followed by the Granger causality methodology in VAR.

The structure of the work is determined by the objectives of the research. After the introductory part, follows: Section 2 reviews the literature on foreign direct investment, economic growth and trade openness. Section 3 covers the data sources and methodological framework. Section 4 refers to empirical methodology Section 5 focuses on results and discussion. Finally, Section 6provides the concluding remarks and policy recommendations.

II.   LITERATURE REVIEW

In economic theory, a number of distinguished economists, such as Paul Romer, Robert Lucas and Gregory Mankiw, are interested in studying the relationship between foreign trade and economic growth. Namely, the most significant positive implication of Romer's model refers to the possibility of an economy with a larger total volume of human capital to achieve accelerated growth. This finding suggests that free international trade can influence the acceleration of the economic growth of the economy.On the other hand, the research of Krajišnik and Tomaš (2014) in addition to the analysis of the impact of the increased volume and changed structure on foreign trade and accelerated economic growth, also referred to the impact of legal regulations, institutions and trade policy on the volume of exchange, trade openness and economic growth.In the economic literature, conflicting views have emerged regarding the relationship between trade and economic growth. There is no clear limit, to what extent there is a positive relationship between trade and economic growth, due to the fact that trade has a stimulating effect on growth, and to what extent it is a reflection of the fact that economic growth leads to increased trade.Namely, the rate of economic growth varies between different countries, the dynamics of technological progress is closely related to the economic structure of an individual country, and when monetary and fiscal policies are not taken into account, a negative impact on economic growth has been recorded.

Sothan (2016) conducted a study that included measures related to trade and FDI, in order to simultaneously investigate the long-term effects on economic growth. The obtained results point to the emergence of different patterns of causality. Namely, FDI has an impact on trade, which is the cause of economic growth, without a direct effect on the growth of FDI.An empirical study by Demir&Lee (2022) using data on bilateral FDI flows in the period 1990 to 2012 analysed the heterogeneous growth effects of FDI originating from the North, the developing South, and the South of each group of countries.Their research confirmed that the long-term effects of FDI are limited to the level and not to the growth rate of GDP per capita. Therefore, regardless of the direction, no effect of FDI that would cause an improvementeffect of economic growth was detected. However, the research results confirmed that there is a positive long-term effect on the level of GDP per capita in the North-North, EmergingNorth and South-Start sub-regions. Namely, the gap in institutional development between host and home countries affects the growth potential spillover.

Makun (2018) investigated the impact of imports, remittances and FDI on the economic growth of the Republic of Fiji Islands during the period 1980 to 2015. The results of the study confirmed that imports have a significant negative impact on economic growth. On the other hand, a positive impact of remittances and FDI on economic growth has been determined, both in the long term and in the short term in this country.

The study conducted by Blomstorm et al. (1994) is examining the empirical relationship between economic growth and foreign direct investments. The results found that there is a significant correlation between inflows of FDI as a percentage to GDP and the growth per capita GDP across all developed countries for the period 1960-1985. They pointed out that although the gap in technology and productivity between foreign-owned and domestic-owned firms is significantly larger in poorer countries than in richer ones, thaт does not necessarily mean that poorer countries reap the greatest benefits from inward FDI.The authors supported their claim with an empirical model, which confirms that FDI inflows are significant determinants of growth for the top half of the distribution of countries, when ranked by per capita income, but not for the bottom half.

Jayachandran (2010) investigated the relationship between trade, foreign direct investment and economic growth in India in the period from 1970 to 2007. According to this study, the variables have a long-term equilibrium relationship. The Granger causality test revealed that there is a causal relationship between

each variable. Javed et al. (2012) examined the relationship between trade, foreign direct investments and economic growth in Pakistan, Bangladesh, Sri Lanka and India with the application of data from 1973 to 2010. The results of the conducted study determined an exceptionally high growth of FDI in the analyzed period, with the exception of the case of Sri Lanka. On the other hand, exports have a positive effect on production for several South Asian countries, while imports have a positive effect on production only in Pakistan and Sri Lanka.

Dutta et al.(2017) investigated the causal relationship between foreign direct investment, trade openness, domestic investment and economic performance in Bangladesh for the period 1976-2014. Based on the research, it has been determined that there is unidirectional relationship from foreign direct investment to economic growth, domestic investment to trade openness, economic growth to trade openness. In addition, bidirectional causality has been established between foreign direct investment and domestic investment, as well as between domestic investment and economic growth.

Shkorupova (2014) examined the relationship between FDI, economic growth and exports in Slovakia in the period 2001-2010. The results obtained confirmed the long-term relationship among the investigated variables. Namely, FDI and exports have a positive impact on Slovakia's GDP.

In order to investigate the connection between exports, FDI and economic growth, Mahmoodi M. & Mahmoodi E. (2016) conducted a panel analysis on eightEuropean and eight Asian countries. The results of their research on Europeancountries showed that there is a bidirectional relationship between GDP and FDI in the short run. As for the relationship between GDP and exports, the results showed a unidirectional relationship. When it comes to Asian countries, the results showed a relationship in the long runand the short run between economic growth and exports. Finally, their results showed a long run bidirectional relationship between FDI, exports and economic growth for both groups of countries.

III.METHODOLOGY AND MODEL SPECIFICATION

3.1. Methodology

In order to examine the main objective through estimating the causal relationship among trade openness, foreign direct investment and economic growth, this study employs annual time series for the Republic of North Macedonia, from 2000 to 2021 based on the electronic distribution of data on the World Development Indicators.

The variables used in the model are measured in the following way: the dependent variable in the model is economic growth estimated by real GDP measured through purchasing power parity.

The specification of the model in the study follows the growth function, where it is assumed that economic performance is sensitive to foreign capital and trade flows in the presence of high institutional quality. Trade, measured as a share of total trade in GDP, and FDI as a net inflow of foreign direct investment as a share of GDP were taken as independent variables.

At the same time, for the trade openness variable, we use the most frequently used measure in economic literature, which is the ratio of total trade (sum of exports and imports) to GDP (King & Levine, 1993). In this study, net inflows as a percentage of GDP are used as a measure of the FDI variable.

In order to be able to test the causal relationship among trade openness, foreign direct investment and economic growth in the Republic of North Macedonia, the Engle-Granger causality test was used in the vector automatic regression (VAR) framework. The application of this approach is closely related to the fulfillment of two prerequisites: the unit root test and the cointegration test, in order to avoid invalid conclusions.

3.2. Model Specification

The empirical model is used to test whether FDI causes GDP, whether GDP causes TO, or whether there is a unidirectional or bidirectional causal relationship between GDP and TO and GDP and FDI. In this research, Granger causality is used under VAR to determine the relationship among GDP, FDI and TO.
The functional form is:

$GDP = f(TO, FDI)$ (1)

The function can be presentedin log-linear econometric format as follows:

$LGDP_t = \alpha_0 + \beta LTO_t + \beta_1 LFDI_t + \varepsilon_t$ (2)

Where:
LGDP = Log (Gross Domestic Product
LTO = Log (Trade Openness)
LFDI = Log (Foreign Direct Investment)
$\alpha_\circ$ = constant term
t = time trend
ε = random error term

The estimate the econometric model, the theory of co-integration has been used for this purpose. In the study, it is assumed that it is effective to test the relationships between the individual variables, and then to empirically confirm the results obtained after performing the statistical tests used in the model. Engle and Granger presented the theory of co-integration, where a stationary linear combination indicates the existence of a relationship of long-term equilibrium between the studied variables.Therefore, checking the co-integrating characteristics of the series under investigation is considered an extremely important step before performing causality testing. If it is confirmed that the variables are co-integrated, an error correction model should be used. In the case when co-integration between the variables is not established, the VAR model is applied, and its assessment is done using time series, which have previously been transformed into stationary values.

IV. EMPIRICAL METHODOLOGY

The study adopts Vector Autoregressive Model (VAR) and Granger causality test to test the hypothesis regarding the relationship among trade openness, foreign direct investment and economic growth. The VAR is applicable when the series are integrated of order one [I (1)] (or at first difference), and there is a short-run relationship among the variables. In determining the stationarity properties of the series, the parametric Augmented Dickey-Fuller (ADF) test (Dickey & Fuller, 1979, 1981) and the non-parametric Phillips and Perron (1988) were used. In these tests, the null hypothesis of a unit root (non-stationarity) is tested against the alternative hypothesis of stationarity (no unit root). Rejecting (not rejecting) the null hypothesis confirms that the series is stationary (not stationary) within the sample period. After establishing the stationarity properties of the series, the co-integration test of the variables is tested using the Johansen co-integration test introduced by Johansen and Juselius (1990), which provides two test statistics—a trace test statistic and a maximum eigenvalue in order to decide whether there is a long-term relationship among the variables. The null hypothesis of no co-integration (r=0) cannot be rejected. In this study, the optimal lag selection is chosen using the Schwarz-Bayesian Criterion (SBC).

After confirmation of a valid short-term relationship among the variables, the study first assesses the direction of causality between the variables using pairwise Granger causality test.This causality of co-integrated variables is captured in the vector error correction model (VECM). In VECM there is a separation of long-term and short-term parameters. In this study of linear combinations of non-stationary variables, it is determined that there is no cointegration between the variables. In the absence of cointegration, the unrestricted VAR is estimated in the first difference, which has the following form:

$$\Delta RGDP_t = \sum_{i=1}^{k} \beta_1 \Delta RGDP_{t-1} + \sum_{i=1}^{k} \alpha_1 \Delta TO_{t-1} + \sum_{i=1}^{k} \alpha_2 \Delta FDI_{t-1} + \varepsilon_{1t} \quad (3)$$
$$\Delta TO_t = \sum_{i=1}^{k} M_1 \Delta RGDP_{t-1} + \sum_{i=1}^{k} N_1 \Delta TO_{t-1} + \sum_{i=1}^{k} \alpha_3 \Delta FDI_{t-1} + \varepsilon_{2t} \quad (4)$$
$$\Delta FDI_t = \sum_{i=1}^{k} G_1 \Delta RGDP_{t-1} + \sum_{i=1}^{k} J_1 \Delta TO_{t-1} + \sum_{i=1}^{k} \alpha_4 \Delta FDI_{t-1} + \varepsilon_{3t} \quad (5)$$

Where RGDPt, TOt and FDIt are represents economic growth and trade openness and foreign direct investment respectively. Δ is the difference operator; and $\varepsilon_{1t}, \varepsilon_{2t}$ and ε_{3t} the serially uncorrelated error terms in equation (3), (4) and (5): k, is the numbers of optimum lag length, which is determined empirically by Schwarz criterion (SC), β_1, α_1 M1 and N1, G1 and J1 are all short run coefficients to be estimated. For each equation in the above VAR, Wald χ^2 statistics is used to test the joint significance of each of the other lagged endogenous variables in that equation. For $\Delta RGDP_t$ to be unaffected by ΔTO_t and ΔFDI_t, $\Sigma\alpha_1$ and $\Sigma\alpha_2$, respectively must not be significantly different from zero. Similar logic applies to TOt and FDItand $\varepsilon_{1t}, \varepsilon_{2t}$ and ε_{3t} the serially uncorrelated error terms.

V. RESULTS AND DISCUSSION

The results of the descriptive statistics for the sample of the three variable under examination are shown in Table 1. The results from the table 1 showed that the trade openness (TO) has a normal skewness andplatykurtic because 2.09 <3, foreign direct investment (FDI) has normal skewness and platykurtic because 2,008 <3, while real gross domestic product has a long left tail (negative skewness) and platycurtic because 1.73 < 3.Furthermore, the values of Jarque-Berashowed that the data for all three variables such as RGDP, TO and FDI are normally distributed.

Table 1. Descriptive statistics

	RGDP	TO	FDI
Mean	27527.77	104.6400	3.70E+08
Medium	28033.5	108.8300	3.59E+08
Maximum	34833.00	148.4700	7.33E+08
Minimum	20089.00	71.07000	7693780.0

Std. Dev.	4914.256	22.52227	2.10E+08
Skeweness	-0.138224	0.084946	0.032733
Kurtosis	1.726126	2.099402	2.008090
Jarque-Bera	1.557580	0.769946	0.905824
Probability	0.458961	0.680469	0.635774
Sum	605611.0	2302.080	8.15E+09
Sum Sq. Dev.	5.07E+08	10652.30	9.28E+17
Observations	22	22	22

Source: Author compilation obtained by Eviews

5.1. Unit root test

Table 2 presents the estimates of the unit root tests, such as The Augmented Dickey – Fuller (ADF) and the Phillip – Perron test of each variable, which were conducted both at level and first difference of the variables. The results of the ADF test and PP test showed that all the variables used in the analysis are stationary in first differences. This implies that the trade openness, foreign direct investment and economic growth (RGDP) are integrated in order one [i.e. I (1)].

Table 2. Unit Root Tests

Variables	ADF		PP		Order of integration
	Level	1st Diff.	Level	1st Diff.	
LRGDP	0.5246	0.0011**	0.8379	0.0011**	I (1)
LTO	0.8438	0.0008**	0.9768	0**	I (1)
LFDI	0.0015	0.0022**	0.0014	0**	I (1)

Source: Author compilation obtained by Eviews
Notes: (**) significant at the 5%

5.1.1 Lag length optimum test

Vector auto-regression (VAR) is an econometric model used to understand the linear relationships of variables with multiple time series. Models included in VARs simplify the autoregression model by allowing for the influence of more than one variable at a time serial data. The preliminary task in estimating the VAR model is to determine the optimal order of lag length. The result as presented in Table 3 indicates that 1 is the most optimal number of lags for the model by using Schwartz information criteria.

Table 3. Lag Selection Criteria

Number of lags	Sequential modified LR test statistic (LR)	Final prediction error (FPE)	Akaike information criteria (AIC)	Schwartz information criteria (SC)	Hannan- Quinn information criterioa (HQ)
0	NA	0.000155	-0.260245	-0.111027	-0.227860
1	74.29036*	4.68e-06*	-3.773123*	-3.176253*	-3.643587*

Source: Author compilation obtained by Eviews

5.2. Co-integration test

The study proceeds with testing for cointegration using Johansen's cointegration test to the variables in order to ascertain whether the analysed variables were cointegrated. This technique observes the long run relationship among the non- stationary variables while showing number of co-integrating equations. The test is based on the comparison of H0 (r=0) against the alternative H1 (r^0) where"r" represents the number of co integrating vectors.

Table 4. Johansen Cointegration Test Based on Trace Values

Hypothesized No. of CE (s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.616452	29.16864	29.79707	0.059
At most 1	0.328109	10.00283	15.49471	0.2805
At most 2	0.097406	2.049649	3.841465	0.1522

Source: Author compilation obtained by Eviews
Trace test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
** MacKinnon-Haug-Michelis (1999) p-values

Table 5. Johansen Cointegration Test Based on Maximum-Eigen Values

Hypothesized No. of CE (s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.616452	19.16582	21.13162	0.0921
At most 1	0.328109	7.953180	14.26460	0.3835
At most 2	0.097406	2.049649	3.841465	0.1522

Source: Author compilation obtained by Eviews
Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
** MacKinnon-Haug-Michelis (1999) p-values

Table 4 and 5 exposed the result from the cointegration test. The result confirms that the null hypothesis of absence of cointegration (p=0) cannot be rejected. Therefore, there is no long-term association between the variables in our study. The obtained results deviate from the usual characteristic of cointegratedvariables which is related to the usual behavior of non-stationary variables to move together in the long run. The results confirm that there were no long-term cointegrating relationships between the three variables. In other words, trade openness, foreign direct investments and economic growth do not have a common trend and long-run equilibrium for the Republic of North Macedonia. Therefore, the study rejects the notion of error correction in the proposed trivariate Granger causality framework.

5.3. VAR and Granger-Causality Test
Granger causality test is widely used by researchers to determine the causal relationship between variables. This test has other advantages that it also determines the direction of causality. Since we did not find cointegration among the variables (RGDP, TO and FDI), we conducted Granger causality using VAR. The results are shown in Table 6.

Table 6. Pairwise Granger Causality Test

Null Hypothesis:	F-Statistic	Prob.	α=0.05
LFDI does not Granger Cause LRGDP	2.68397	0.1187	Not rejected
LRGDP does not Granger Cause LFDI	3.30938	0.0856	Not rejected
LTO does not Granger Cause LRGDP	0.49611	0.4902	Not rejected
LRGDP does not Granger Cause LTO	6.98096	0.0166	Rejected
LTO does not Granger Cause LFDI	2.36443	0.1415	Not rejected
LFDI does not Granger Cause LTO	3.08038	0.0962	Not rejected

Source: Author compilation obtained by Eviews

From the results of the Pairwise Granger causality test can be noted that if the probability of the F-statistics < α, then H0 is rejected. Therefore, the null hypothesis that RGDP does not Granger cause TO is rejected, which indicates unidirectional causal relationship running form economic growth to trade openness. There is no causality between foreign direct investment and economic growth, as well as between trade openness and foreign direct investment.

VI. CONCLUSION AND POLICY RECOMMENDATIONS

The aim of our study is to perform empirically investigating for the relationship among trade openness, foreign direct investment and economic growth in the Republic of North Macedonia during the period 2000-2021. The study employs multivariate VAR framework.

The obtained results indicated that unit root tests ADF test and PP of time series confirmed that RGDP, TO and FDI are non-stationary at the level data, but stationary at the first differences. The Johansen's multivariate co-integration test evidence from the result suggests the null hypothesis of no co-integrationcannot be rejected. The findings showed absence of co-integration among observed variables in the long run. After, finding no co-integration among the variables (RGDP, TO and FDI, we performed Granger causality with mean VAR. The result shows the existence of unidirectional causality between economic growth and trade openness. The study, confirmed that foreign direct investment does not Granger cause economic growth and economic growth does not Granger cause foreign direct investment. At the same time, trade openness does not Granger cause foreign direct investment and foreign direct investment does not Granger cause the degree of trade openness.

Starting from the fact that the impact of trade openness and FDI on economic growth cannot be overestimatedunambiguously describe, it can be concluded that they have an important role in the economy,therefore, they are at the center of development policies and strategies of many countries.

The obtained results suggest that the most effective way toattracting FDI, thus economic growth of North Macedonia, focusing on strengthening the following areas: free trade zone, trade regime, tax incentives, workforce, financial system and infrastructure quality. Despite the fact that the statistical significance in the paper indicates the existence of other factors that influence economic growth, which are not included in thisresearch, the conclusions of the research in the paper can be useful whenadopting effective policies and strategies for growth and development of the Republic of North Macedonia.

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