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Foreign Direct Investment and Export Incentive Policies: Do They Enhance Growth?

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ABSTRACT

The main idea of the paper is to determine whether incentive policies contribute to economic growth. The goal of the research is to examine whether foreign direct investments and export promote economic growth with the purpose of determining a causal relationship between the variables and then identifying implications for policy measures. Policy makers design and implement various incentive policies but those often do not bring expected benefits. A careful consideration of budget costs and benefits is therefore required. Various econometric methods on different series definitions are used to ensure the robustness of the findings, including unit-root tests with structural break, Engle-Granger cointegration tests, Johansen cointegration test, and Granger causality test. Empirical testing was conducted to test the hypothesis that incentive policies do not fulfill their purpose in ensuring growth. Findings reveal that foreign direct investment and export of goods and services do not have an unequivocally statistically significant impact on the economic growth in the Republic of Croatia which leads to the conclusion that incentive measures did not fulfill their potential.

INTRODUCTION

Global economy is going through major changes, from the aspect of digitalization, migration, economic volatility, health sector and etc. Countries of all sizes and levels of development need to adapt to this new environment and stay healthy and competitive. Economic growth is therefore one of the main economic goals of policy makers around the world. However, factors that contribute to economic growth change over time (Chlebisz and Mierzejewski, 2020). Classic growth models indicate that an increase in production factors is one of the most important sources of growth. Enhancing productive capacity along with investments and saving leads to economic growth. Foreign direct investments (FDI) and exports are also often mentioned contributors to growth. In fact, FDI represents one of the most stable long term

form of capital and often, as a synthesis of capital stock, knowledge and technology, FDI pushes the technological progress through technological spillover, especially in developing countries (Borenztein et al., 1998). That is why many countries had opened their economies and started to attract FDI. Based on vast empirical and theoretical evidence on the positive relationship between FDI, export and growth (Borenztein, 1998; Hong, 2014; Nguyen et al., 2021), policy makers design policies to promote openness and foreign investments (Dorozynski et al., 2021). However, it is not automatically guaranteed that those will in fact promote growth. There are some studies that indicate modest contribution or even ineffectiveness of FDI (Hobbs, 2021) and export (Bajo-Rubio, 2020; UNCTAD, 2013) in promoting growth, which raises questions on the effectiveness and appropriateness of incentive policies and measures. There are other factors that need to be considered, especially in the age of digitalization. Those include available skills, level of technological development, regional integration and cooperation, level of financial market development and other (Sobieraj and Metelski, 2021).

Simionescu (2016) analyzed FDI and growth nexus on the sample of European Union and found a reciprocal relationship between the two variables. She concluded that the EU policies should include the extension of the single European market, increasing the degree of openness and competitiveness outside and inside the EU, an attractive tax system and a modern infrastructure in all of the EU countries. OECD (2003) defined several criteria for determining the usefulness or harmfulness of FDI incentives. Firstly, a country should measure whether the use of incentives results in greater benefits for the host country than budget costs. Otherwise, incentives are ineffective. Secondly, a country should measure whether the government has succeeded or failed to maximize those benefits and minimize costs. In other words, if the same benefits could have been realized at lower costs, then incentives are inefficient. There could also be some opportunity costs. Incentives can be effective and efficient, but still wasteful if these funds could be used in another, more profitable way. Finally, if the incentive measures cause other competing countries to increase their incentives it can lead to excessive spending, and ultimately, it can have a detrimental effect on the domestic economy (OECD, 2003). Costs from incentive policy are also measured by the redundancy rate, that is, the number of companies that would invested regardless of incentives. Chai and Goyal (2008) found that incentives have a negligible effect on FDI and that estimated loss of tax revenues is 9.5% to 16 5% of GDP. Incentives are also often discriminatory towards small and local firms and may cause administrative problems for tax authorities. It can be concluded that designing effective incentive policy is a complex task and often results in the transfer of profits and welfare to foreign investors instead of the host country. Loewendahl (2018) states that clear institutional framework together with government coordination are crucial for attracting FDI and promoting export.

The main aim of the paper is to examine whether foreign direct investments and export promote economic growth. Based on the research results conclusions are made regarding the usefulness of incentive policies.

1. LITERATURE REVIEW

The impact of FDI and trade on economic growth has been researched for decades. However, there are mixed results and diverse conclusions. Hobbs et al. (2021) researched the relationship between FDI, exports and economic growth. They found that FDI does not contribute to economic growth in the long run. On the other hand, exports showed to be more efficient in promoting growth. Shabbir and Naveed (2010) also examined the cointegration relationship between foreign direct investment, exports, and gross domestic product (GDP) in Pakistan. The result showed that there is a long-term link between growth and exports, but not foreign direct investment. Besides FDI, authors note that there are other complementing factors that contribute to growth. Dinh et al. (2019) empirically researched the effect of FDI on economic growth using various econometric tests. They concluded that in the long run FDI has a positive effect on growth, while in the short run it has a negative effect. They also found that other macroeconomic factors contributed to growth such as human capital, domestic investments, domestic credit etc. Abbes et al. (2015) analyzed the relationship between foreign direct investment and economic growth using cointegration and panel Granger causality tests. The results showed a disparity in the relationship between the cointegration of the panel study. The results also indicated a one-way causality

from foreign direct investment to GDP, which could be a good tool for prioritizing the allocation of resources by sector to promote foreign direct investment.

On the other hand, there are studies which indicate to different conclusions from the ones above. Harris and Danila (2018) examined the effect of FDI on growth. They came to the conclusion that FDI does not have any impact on GDP, while some other variables influence the growth of the economy. In their study authors imply that the package of economic policies and taxation are not enough for FDI to have an impact on GDP, but other factors, such as wage rate, labor skills, transport and infrastructure, and property rights, must be developed. Similarly, Hong (2014) researched the relationship between FDI and growth in China. He found that FDI positively affects growth but also that economy of scale, human capital, infrastructure, wage levels, and regional disparities interact actively with FDI and promote economic growth, while openness of trade does not induce FDI significantly. Yue et al. (2016) found that FDI positively affects green growth in China, but they also note that the effect is different in different sectors. Cakrovic and Levine (2005) and Hudakova et al., (2020) also tested the impact of FDI on economic growth. Their results revealed that there is no significant impact of FDI on growth. They claim that although sound policies may spur FDI and growth, their results indicate that FDI does not have positive impact on growth without other related determinants. (2012). On the other hand, Stojčić and Orlić (2016) found beneficial effect of FDI on export sophistication and consequently, on growth.

2. METHODOLOGY AND DATA

Empirical analysis conducted in this paper is based on examining the relationship between economic growth, FDI and exports in the Republic of Croatia with the purpose of discussing and reaching a conclusion about the effectiveness of incentive policies. If incentives do not contribute to growth the question about their usefulness arises. Annual data on gross domestic product (GDP), foreign direct investment (FDI) and exports of goods and services (EXP) from 1995 to 2020 are used in the analysis. Following empirical tests are conducted in the paper: (i) unit root tests with structural breakdown, (ii) cointegration tests and (iii) Granger causality test. In order to test the robustness of results, two alternative definitions of series are employed:

Definition 1: rtGDP_WDI_CON, Log(FDI_GDP_WDI_DEF), Log(EXP_GDP_WDI_DEF).

Definition 2: rtGDP_WDI, Log(FDI_GDP_WDI), Log(EXP_GDP_WDI).

Series of data are in current prices, after converting FDI_GDP_WDI and EXP_GDP_WDI series by GDP deflator. In both definitions series FDI and EXP are shown as percentage shares. This is in accordance with the prevalent approach in the recent literature. Table 1 contains definitions of variables used in the analysis along with data sources.

Table 1. Variables and sources of data

Series	*Description and data source*
GDP_WDI_CON	GDP (constant 2010 US$) Data are in constant 2010 U.S. dollars. Dollar figures for GDP are converted from domestic currencies using 2010 official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used. Source: World Bank national accounts data, and OECD National Accounts data files. Economic Policy & Debt: National accounts: US$ at constant 2010 prices: Aggregate indicators Series Code: NY.GDP.MKTP.KD
rGDP_WDI_CON	Growth rate GDP_WDI_CON (u %)
rtGDP_WDI_CON	LOG transformation of growth rate rGDP_WDI_CON due to negative growth rates (in %)
GDP_WDI	GDP (current US$) Data are in current U.S. dollars. Dollar figures for GDP are converted from domestic currencies using single year official exchange

Series	*Description and data source*
	rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used. Source: World Bank national accounts data, and OECD National Accounts data files. Economic Policy & Debt: National accounts: US$ at current prices: Aggregate indicators. Series code: NY.GDP.MKTP.CD
rGDP_WDI	Growth rates GDP_WDI (u %)
rtGDP_WDI	LOG transformation of growth rate rGDP_WDI due to negative growth rates (in %)
FDI_WDI	Foreign direct investment, net inflows (BoP, current US$) Foreign direct investment refers to direct investment equity flows in the reporting economy. Source: International Monetary Fund, Balance of Payments database, supplemented by data from the United Nations Conference on Trade and Development and official national sources. Economic Policy & Debt: Balance of payments: Capital & financial account. Source code: BX.KLT.DINV.CD.WD
FDI_GDP_WDI	Foreign direct investment, net inflows (% of GDP) This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP. Source: International Monetary Fund, International Financial Statistics and Balance of Payments databases, World Bank, International Debt Statistics, and World Bank and OECD GDP estimates. Economic Policy & Debt: Balance of payments: Capital & financial account. Source code: BX.KLT.DINV.WD.GD.ZS
EXP_WDI	Exports of goods and services (BoP, current US$) Source: International Monetary Fund, Balance of Payments Statistics Yearbook and data files. Economic Policy & Debt: Balance of payments: Current account: Goods, services & income. Source code: BX.GSR.GNFS.CD
EXP_GDP_WDI	Exports of goods and services (% of GDP). Source: World Bank national accounts data, and OECD National Accounts data files. Economic Policy & Debt: National accounts: Shares of GDP & other. Source code: NE.EXP.GNFS.ZS
GDP_DEF	GDP deflator (in %). Source: WDI.
GDP_WDI_DEF	Series GDP_WDI / GDP_DEF *100
rGDP_WDI_DEF	GDP growth rate GDP_WDI_DEF (in %)
rtGDP_WDI_DEF	LOG transformation of growth rate rGDP_WDI_DEF due to negative growth rate (in %)
FDI_WDI_DEF	Series FDI_WDI / GDP_DEF *100
FDI_GDP_WDI_DEF	Share of FDI_WDI_DEF in GDP_WDI_CON (in %)
EXP_WDI_DEF	Series EXP_WDI / GDP_DEF *100
EXP_GDP_WDI_DEF	Share of EXP_WDI_DEF in GDP_WDI_CON (in %)

Source: authors.

2.1 Unit-root tests

The first test used in the research was Perron and Vogelsang test. There are two forms of this unit-root test: the additive outlier (AO) model and the innovative outlier (IO) model. Our results suggest consideration of models with a possible additive deviation due to a sudden change in the mean value of the series.

Secondly, Zivot & Andrews test () was used as it allows one structural break in the level and trend of the series. In order to test the hypothesis of the existence of a unit-root in a series in which there is a single structural break, the following three models were evaluated:

Model A:

$$\Delta y = \mu + \beta t + \alpha y_{t-1} + \theta DU_t + \sum_{i=1}^{k} c_i \, \Delta y_{t-i} + \varepsilon_t$$

Model B:

$$\Delta y = \mu + \beta t + \alpha y_{t-1} + \gamma DT_t + \sum_{i=1}^{k} c_i \, \Delta y_{t-i} + \varepsilon_t$$

Model C:

$$\Delta y = \mu + \beta t + \alpha y_{t-1} + \theta DU_t + \gamma DT_t + \sum_{i=1}^{k} c_i \, \Delta y_{t-i} + \varepsilon_t$$

where DU_t i DT_t are dummy variables for changes in the level and trend of the series. The change can occur at any time T_B (1 <T_B <T). These variables are defined as follows:

$$DU_t = \begin{cases} 1, \text{if}, t > T_B \\ 0, \text{ otherwise} \end{cases}$$

$$DT_t = \begin{cases} t - T_B, \text{if}, t > T_B \\ 0, \text{otherwise} \end{cases}$$

where k is the number used for each time point in which the break occurred, using one of the information criteria (e.g., AIC or Schwarz SIC criterion).

Clemente et al. (1998) defined a test that can be used if a series has one or two breaks. The null hypothesis is:

$$H_0: y_t = y_{t-1} + \delta_1 DTB_{1t} + \delta_2 DTB_{2t} + u_t.$$

Alternative hypothesis is:

$$H_1: y_t = u + d_1 DU_{1t} + d_2 DTB_{2t} + e_t,$$

where $DU_{it} = 1$, when $t > TB_i$ $(i = 1{,}2)$, DTB_{it} is an impulse variable which taken on the value 1 when $t = TB_1 + 1$ $(i = 1{,}2)$ and 0 otherwise. TB_1 i TB_2 are the dates of the break when the middle of the series changed. If two breaks were caused by an innovative outlier, then the unit-root hypothesis can be tested by first evaluating the following model:

$$y_t = \mu + \rho y_{t-1} + \delta_1 DTB_{1t} + \delta_2 DTB_{2t} + d_1 DU_{1t} + d_2 DU_{2t} + \textstyle\sum_{i=1}^{N} c_i \Delta y_{t-i} + e_t.$$

If the middle of the series has changed due to the additive outlier, then the null unit root hypothesis can be tested using the following two-step procedure. In the first step, the deterministic part of the series is removed by evaluating the next model:

$$y_t = \mu + d_1 DU_{1t} + d_2 DU_{2t} + \tilde{y}_t.$$

Unit-root test was also applied with the search of minimal value of the *t*-statistics when $\rho = 1$ in the model:

$$\tilde{y}_t = \textstyle\sum_{i=1}^{N} \omega_{1i} DTB_{1t-1} + \sum_{i=1}^{N} \omega_{2i} DTB_{2t-1} + \rho \tilde{y}_{t-1} + \sum_{i=1}^{N} c_i \Delta \tilde{y}_{t-i} + e_t.$$

2.2 Cointegration tests

The existence of cointegration between series can be tested with several tests. Two versions of the Engle Granger test are used in this analysis: the standard and the extended Engle-Granger test. The extended Engle-Granger test is used in the case when the conditions of the standard test for errors to be serially independent are not met. Then, in the regression equation of the test, the residues of the first residual difference can be included so that the residual parts in that regression appear to be serially uncorrelated. As it will be shown in the results, unit-root tests suggested that the real GDP growth rate and the series of shares of foreign direct investment and exports of goods and services in real GDP are of the same order of integration (I (1)), so it is possible to apply the Johansen cointegration test.

In the final step of the analysis, Granger's causality test is performed. Series X is said to cause series Y in terms of Granger if Y can be better predicted using past values of series X and Y than just using past values of series Y.

3. RESULTS AND DISCUSSION

3.1 Results of the unit-root tests

Testing the hypothesis of the existence of a unit-root in a series with a fracture was performed using Perron and Vogelsang (PV), Zivot and Andrews (ZA), and Clemente, Montanes, and Reyes (CMR) tests. In the case of the CMR test, models with additive (AO) and innovative outlier (IO) were used. The results are presented in Table 2.

Table 2. Unit-root tests with single structural break

Series	*PV (AO)*			*ZA (AO)*			*CMR (AO)*			*CMR(IO)*		
	stat	*TB*	*O*	*stat*	*TB*	*O*	*stat*	*TB*	*O*	*stat*	*TB*	*O*
	Level of series											
GDP1	-3.03 (.67)	2008	I(1)	-3.43 (>.10)	2009	I(1)	-2.79	2010	I(1)	-3.00	2006	I(1)
GDP2	-4.02 (.15)	2008	I(1)	-4.77 (>.05)	2009	I(1)	-3.64	2010	I(0)	-37.8	2007	I(0)
FDI1	-5.78 (<.01)	2014	I(0)	-6.03 (<.01)	2015	I(0)	-4.20	2012	I(0)	-11.3	2013	I(0)
FDI2	-5.82 (<.01)	2015	I(0)	-5.80 (<.01)	2015	I(0)	-4.44	2012	I(0)	-5.65	2013	I(0)
EXP1	-3.79 (.24)	2005	I(1)	-3.83 (>.10)	2004	I(1)	-3.74	2005	I(0)	-3.32	2001	I(1)
EXP2	-3.21 (.56)	2009	I(1)	-2.98 (>.10)	2008	I(1)	-0.70	2012	I(1)	-3.21	2008	I(1)
	First differences											
GDP1	-5.34 (<.01)	2009	I(0)	-4.60 (>.05)	2011	I(1)	-3.79	2017	I(0)	-60.4	2008	I(0)
GDP2	-6.45 (<.01)	2001	I(0)	-4.73 (>.05)	2009	I(1)	-2.65	2016	I(1)	-5.24	2008	I(0)
FDI1	-13.8 (<.01)	2015	I(0)	-8.23 (<.01)	2009	I(0)	-6.10	2013	I(0)	-13.8	2014	I(0)
FDI2	-13.5 (<.01)	2015	I(0)	-8.34 (<.01)	2000	I(0)	-6.06	2013	I(0)	-13.5	2014	I(0)
EXP1	-4.28 (.08)	2000	I(1)	-4.89 (<.05)	2001	I(0)	-4.40	2001	I(0)	-4.28	1999	I(0)
EXP2	-4.12 (.11)	2019	I(1)	-4.03 (>.10)	2010	I(1)	-2.44	2017	I(1)	-3.64	2008	I(1)

Note: TB is the break. "O" means a decision made on the basis of a materiality level of 5%. The P-value is given in parentheses below the test statistic. The null hypothesis for these tests is that the series has a unit-root with a single brak. The Schwarz information criterion was used to select the degree of magnification for the Perron & Vogelsang test. Minimized Dickey-Fuller t-statistics were used to select breaks in these tests. Critical values for the Clemente-Montañés-Reyes single root single-break test are for AO and IO -3.56 and -4.27 at a significance level of 5%.

Source: authors.

Testing of the hypothesis of the existence of a unit-root in a series with two structural breaks was performed using the CMR test in which the models with additive (AO) and innovative outlier (IO). The results are presented in Table 3.

Table 3. Clemente-Montañés-Reyes unit root tests with two endogenous breaks

Series	*IO*				*AO*			
	t-stat	*TB_1*	*TB_2*	*Decision*	*t-stat*	*TB_1*	*TB_2*	*Decision*
	Level							
GDP1	-4.19	2007	2013	I(1)	-3.41	2006	2014	I(1)
GDP2	-37.78	2001	2007	I(0)	-5.26	2001	2006	I(1)
FDI1	-6.88	2013	2017	I(0)	-3.10	2012	2017	I(1)
FDI2	-6.09	2009	2013	I(0)	-3.35	2012	2017	I(1)
EXP1	-2.31	2002	2009	I(1)	-1.74	1998	2004	I(1)
EXP2	-6.02	1998	2012	I(0)	-3.82	2001	2013	I(1)
	First differences							
GDP1	-60.43	1998	2008	I(0)	-4.27	2007	2013	I(1)
GDP2	-5.24	1999	2008	I(1)	-3.47	2007	2011	I(1)
FDI1	-15.25	2012	2014	I(0)	-2.54	2012	2015	I(1)
FDI2	-14.85	2012	2014	I(0)	-2.34	2012	2015	I(1)
EXP1	-5.54	2001	2008	I(0)	-4.04	2000	2007	I(1)
EXP2	-3.52	2002	2008	I(0)	-0.91	2001	2007	I(1)

Note: TB1 and TB2 are breaks The decision on the nature of nonstationarity was made based on a materiality level of 5%. The null hypothesis for these tests is that the series has a unit root with two breaks. The critical value for the Clemente-Montañés-Reyes unit-root test with two structural breaks for IO and AO is -5.49 at a significance level of 5%.

Source: authors.

3.2 Engle-Granger cointegration test results

As explained, two versions of the test were used. The null hypothesis in both versions of the Engle-Granger cointegration test is that the series are not cointegrated. The test results are presented in Tables 4 and 5.

Table 4. Engle-Granger test for series definition 1

Dependent	*tau*-statistics	*P*-value*	*z*-statistics	*P*-value*
	series: Log(rGDP), Log(FDI/GDP) & Log(EXP/GDP)			
With constant as additional regressor				
Log(rGDP)	-2.54	0.49	-10.20	0.49
Log(FDI/GDP)	-2.04	0.72	-9.14	0.57
Log(EXP/GDP)	-1.48	0.90	-4.80	0.89
With trend as additional regressor				
Log(rGDP)	-2.54	0.54	-10.20	0.55
Log(FDI/GDP)	-2.04	0.78	-9.14	0.63
Log(EXP/GDP)	-1.48	0.94	-4.80	0.94

Note: * MacKinnon (1996) P-values. A modified Schwarz information criterion was used to select the degree of increase in the test equation.

Source: authors.

Table 5. Engle-Granger test for series definition 2

Dependent	*tau-statistics*	*P-value**	*z-statistics*	*P-value**
	Series: Log(rGDP), Log(FDI/GDP) & Log(EXP/GDP)			
With constant as additional regressor				
Log(rGDP)	-3.94	0.07	-19.14	0.05
Log(FDI/GDP)	-2.79	0.38	-15.83	0.14
Log(EXP/GDP)	-1.20	0.95	-4.17	0.92
With trend as additional regressor				
Log(rGDP)	-3.94	0.08	-19.14	0.07
Log(FDI/GDP)	-2.79	0.42	-15.83	0.16
Log(EXP/GDP)	-1.20	0.97	-4.17	0.96

Note: * MacKinnon (1996) P-values. A modified Schwarz information criterion was used to select the degree of increase in the test equation.

Source: authors.

Summarizing the results of Engle-Granger tests, it can be concluded that there is no long-term balance between the growth rate of real GDP, the share of foreign direct investment and exports of goods and services in real GDP in Croatia.

3.3 Johansen cointegration test results

The application of Johansen cointegration test is appropriate as the unit-root tests suggested that the real GDP growth rate and the series of shares of foreign direct investment and exports of goods and services in real GDP are of the same order of integration (I (1)). Before applying the Johansen cointegration test, the lag order of the VAR model containing three series, Log (rGDP), Log (FDI/GDP) and Log (EXP/GDP), should be selected. The results of the lag size selection using different selection criteria for lags from 0 to 4 are presented in Tables 6 and 7.

Due to the small sample size, the smallest possible lag length suggestions are preferred. In the case of definition 2, all criteria suggest a VAR (1) model. As the value of the adjusted Q (4) test statistic is 20.53 and the P-value is 0.81, this null hypothesis about the absence of autocorrelation in the estimated VAR (1) model cannot be rejected. Therefore, this VAR model specification will be used in the Johansen test.

Table 6. Optimal lag order of VAR models for series definition 1

lags	LogL	LR	FPE	AIC	SC	HQ
0	-36.561	-	0.010491	3.956	4.105	3.985
1	-5.579	49.572*	0.001183*	1.758*	2.355*	1.874*
2	-0.978	5.980	0.001983	2.198	3.243	2.402
3	3.947	4.925	0.003652	2.605	4.099	2.897
4	9.789	4.089	0.007902	2.921	4.863	3.300

Note: * indicates the lag order of the selected criteria. LR: sequentially modified LR test statistics (each at the 5% level). FPE: Final prediction error. AIC: Akaike information criterion. SC: Schwarz information criterion. HQ: Hannan-Quinn information criterion.

Source: authors.

In definition 2, the Schwarz information criterion suggests a VAR (1) model. Other criteria suggest 3rd and 4th order VAR models. The autocorrelation properties of the residual VAR (1) of the model will be checked. As for this model the value of the adjusted statistic Q (4) of the test is 27.77 and the P-value is 0.42, this null hypothesis about the absence of autocorrelation in the estimated VAR (1) model cannot be rejected. Therefore, this VAR model specification will be used in the Johansen test.

Table 7. Optimal lag order of VAR models for series definition 2

lags	*LogL*	*LR*	*FPE*	*AIC*	*SC*	*HQ*
0	-35.818	-	0.00974	3.882	4.031	3.911
1	-7.871	44.716	0.00149	1.987	2.585*	2.104
2	-2.222	7.343	0.00225	2.322	3.368	2.526
3	15.829	18.051*	0.00111*	1.417	2.911	1.709
4	26.654	7.578	0.00146	1.235*	3.176	1.6136*

Note: * indicates the lag order of the selected criteria. LR: sequentially modified LR test statistics (each at the 5% level). FPE: Final prediction error. AIC: Akaike information criterion. SC: Schwarz information criterion. HQ: Hannan-Quinn information criterion.

Source: authors.

The results of the Johansen test, i.e. the statistics of the trace test and the maximum Eigen value, are presented in Table 8. Based on the statistics of the maximum Eigen value, we cannot reject the null hypothesis of the absence of cointegration between the three series.

Table 8. Johansen cointegration test for series definition 1

Null hypothesis	*Alternative hypothesis*	*Test statistics*	*5% critical value*	*P-value*
		Trace statistics		
$r = 0$	$r \geq 1$	18.28	29.80	0.55
$r \leq 1$	$r \geq 2$	8.76	15.49	0.39
$r \leq 2$	$r \geq 3$	0.92	3.84	0.34
		Maximum Eigen value statistics		
$r = 0$	$r \geq 1$	9.52	21.13	0.79
$r \leq 1$	$r \geq 2$	7.84	14.26	0.40
$r \leq 2$	$r \geq 3$	0.92	3.84	0.34

Note: *P*-value: MacKinnon, Haug & Michelis (1999).

Source: authors.

Table 9. Johansen cointegration test for series definition 2

Null hypothesis	*Alternative hypothesis*	*Test statistics*	*5% critical value*	*P-value*
		Trace statistics		
$r = 0$	$r \geq 1$	20.22	29.80	0.41
$r \leq 1$	$r \geq 2$	8.31	15.49	0.43
$r \leq 2$	$r \geq 3$	*0.01*	*3.84*	0.96
		Maximum Eigen value statistics		
$r = 0$	$r \geq 1$	11.90	21.13	0.56
$r \leq 1$	$r \geq 2$	8.31	14.26	0.35
$r \leq 2$	$r \geq 3$	0.01	3.84	0.96

Note: P-value: MacKinnon, Haug & Michelis (1999).

Source: authors.

In all Johansen test options (both versions of the test statistic) it is suggested that it is not possible to reject the null hypothesis of the absence of cointegration connectivity of the observed three series. ie growth rates of real GDP, the share of foreign direct investment and exports of goods and services in GDP in the Republic of Croatia for the period under study. Although there is no cointegration relationship between the three series, it is possible to examine the existence of a cause-and-effect relationship between them. But before testing the causality of Granger, the robustness of the results obtained by the Johansen cointegration test this time using boundary cointegration tests based on the ARDL model will be checked.

3.4 Granger's causality test

The existence of cointegration indicates only the presence or absence of causality, but not the direction of causality. Once the existence of cointegration is established, then long-term and short-term causality in Granger's terms can be tested within the VECM model. However, as the results showed, there is no cointegration relationship between the series. Therefore, the VECM form of the Granger causality test cannot be used. In this case, Toda and Yamamoto Granger causality test procedure can be used, since this procedure, unlike the test based on the VECM approach, does not require series cointegration. The results of the Toda-Yamamoto procedure are shown in Table 10.

Table 10. Granger causality test for series definition 1

Dependent	*Excluded series*			*All series*	*Causal relationship*
	Log(rGDP)	*Log(FDI/GDP)*	*Log(EXP/GDP)*		
Log(rGDP)	-	0.35 (0.56)	0.39 (0.53)	1.15 (0.56)	No | No | No
Log(FDI/GDP)	0.15 (0.70)	-	0.30 (0.59)	0.74 (0.69)	No | No | No
Log(EXP/GDP)	0.05 (0.82)	0.71 (0.40)	-	1.25 (0.53)	No | No | No

Note: Chi-square statistics values with P-values in parentheses are given. The VAR (1) model was used.

Source: authors.

A causality test according to definition 1 showed that there is no cause-and-effect relationship between any pair of series.

Table 11. Granger causality test for series definition 2

Dependent	*Excluded series*			*All series*	*Causal relationship*
	Log(rGDP)	*Log(FDI/GDP)*	*Log(EXP/GDP)*		
Log(rGDP)	-	1.16 (0.28)	2.07 (0.15)	3.32 (0.19)	No| No | No
Log(FDI/GDP)	7.68 (0.01)	-	1.26 (0.26)	10.18 (0.01)	Yes |No| Yes
Log(EXP/GDP)	8.01 (0.01)	0.65 (0.42)	-	8.12 (0.02)	Yes | No | Yes

Note: Chi-square statistics values with P-values in parentheses are given. The VAR (1) model was used.

Source: authors.

The causality test under definition 2 showed that there is a one-way causal link from the real GDP growth rate to the share of foreign direct investment and the share of exports of goods and services in real GDP.

According to these results, it can be concluded that the question of the existence of a causal link between real GDP growth and the share of foreign direct investment remains open, as the results largely depend on both the definition of these series and the small sample size.

3.5 Discussion

Export and FDI incentive policies have the main purpose of intensifying exports and attracting FDI. Most often those incentive measures include financial, fiscal and other incentives. Financial incentives are most often granted in the form of state subsidies, subsidized state loans, state guarantees and guaranteed export credits, insurance against currency and non-commercial risks, etc. Fiscal incentives are used to attract FDI by reducing the tax burden on foreign investors. Such incentives also include exemptions from import duties or reduction of income tax on foreign investment. There are also other incentives with the aim of increasing profitability, i.e. reducing investment costs through non-financial measures and funds.

Studies such as Gherghina et al. (2019), Iamsiraroj (2015), and Gürsoy et al. (2013) indicate a positive causal relationship between FDI and growth. Accordingly, authors conclude that governments should create more incentives for foreign investment, especially in higher value added activities as they stimulate growth. Burger et al. (2012) analyzed the effectiveness of FDI incentives in Slovenia. They concluded

that subsidized foreign companies outperform local firms and have better qualitative characteristics. In cases when it can be proved that export and FDI are positively linked to growth incentive policies have accomplished their purpose and can be considered as relevant for growth promotion. However, there are cases when such positive relationship is not proven.

Studies such as Khobai et al. (2017) found that FDI has negative or insignificant influence on welfare and growth, depending on the quantile. Carković and Levine (2005) found that FDI does not significantly nor positively impact economic growth indicating that sound incentive policies may contribute to attracting FDI but do not necessarily result in economic growth. Delevic (2020) studied the effectiveness of FDI incentives, but he found no positive effect in terms of employment and crowding-in effect. He concluded that subsidy-driven FDI policy, based on financial subsidies per job created, does not lead to a sustained employment growth pattern. On the other side, most studies on effectiveness of export promotion reveal positive effect of incentives on exports, but the effects do not seem to last in the long run (e.g. Cadot, 2015). Such mixed results do not provide firm and unanimous conclusion about the effectiveness of incentive policies.

CONCLUSION

The purpose of this paper was to examine the relationship between FDI, exports and economic growth and based on the results to determine whether it is opportune to enforce policy incentives. Although FDI and export are most commonly considered as positive contributors to growth, this research does not find evidence to support this conclusion. The results of cointegration tests showed that there is no long-term balance relationship between the annual growth rate of real GDP, the series of shares of foreign direct investment and the share of exports of goods and services in real GDP. The results of the Granger causality test did not indicate unequivocally that there was a cause-and-effect relationship between the real GDP growth rate, the share of foreign direct investment series, and the share of exports of goods and services in real GDP. In other words, foreign direct investment and exports of goods and services do not have an unequivocally statistically significant impact on the GDP growth rate in the Republic of Croatia. This result raises questions about the effectiveness and the appropriateness of incentive policies. Policy makers should carefully reexamine the existing policies and measures and compare budget costs with benefits from FDI and export. It is not uncommon that costs of incentives often offset the benefits and domestic firms and taxpayers carry the burden of such stimulus. This conclusion is made having in mind the limitation of the empirical analysis which is the small sample size, i.e. the shortness of the time series.

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