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Analysis of Economic Freedom, Foreign Direct Investment, and Economic Growth

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Abstrak

This research analyzes the relationship between economic freedom, foreign direct investment (FDI), and economic growth using the Vector Error Correction (VECM) model and the Granger causality test. Panel data from several free trade agreement countries in the Regional Comprehensive Economic Partnership (RPEC) for the period 1997 – 2022. VECM captures cointegration relationships and models short-term adjustments toward long-term balance. Meanwhile, the Granger causality test helps identify the direction of the causal relationship between economic freedom, FDI, and economic growth. Empirical results show that there is a long-term but weak cointegration relationship in the short term between these variables. In addition, it was found that there is a two-way causality between economic freedom and economic growth, as well as between FDI and economic growth. These findings imply that policies encouraging economic freedom and attracting foreign investment can increase a country's economic growth. This research provides empirical insights into the important role of economic freedom and FDI in driving economic growth and related policy implications for creating an environment conducive to investment and sustainable economic growth.

INTRODUCTION

Over the past three decades, the world has witnessed a stunning economic transformation. With the continued implementation of open economic policies and developments in science technology and transportation, countries are increasingly interdependent (Singh & Gal, 2020). On the other hand, countries that are more independent and economically advanced tend to increase international economic relations (Ofori et al., 2023). In this context, many theoretical and empirical studies explain the relationship between foreign direct investment, economic growth, and economic freedom.

Theoretical literature shows that Foreign Direct Investment (FDI) inflows can bring enormous benefits to host countries as they provide positive impacts in many aspects such as increasing domestic capital stock and human resources, improving the skills of managers and the workforce, creating new business sectors, demand for labor, and increasing the skills of managers and the workforce as well as the transfer of innovative technology (new products to production processes) (Alfar et al., 2024). Therefore, how to attract more foreign investment to a country has attracted the great attention of researchers. Since 1950, much research has been conducted to understand the main sources of Foreign Direct Investment (FDI) flows (Chan et al., 2014). Early

theoretical research explored the factors that influence the international investment decisions of multinational companies (Dunning (1988); Hermes & Lensink, (2003). By late 1980, many countries had lifted restrictions on Foreign Direct Investment (FDI) inflows, and global FDI flows were expected to increase 30-fold within 20 years (Ciftci & Durusu-Ciftci, 2022). It is generally accepted that an increase in Foreign Direct Investment (FDI) inflows will stimulate productivity and growth in the host country due to the above reasons. Therefore, since the 1990s, a growing empirical literature has focused on testing this hypothesis with different samples and methodologies but has provided ambiguous results regarding the impact of Foreign Direct Investment (FDI) on economic growth such as (Alfaro et al., (2010); Hermes & Lensink (2003); (Ofori et al., 2023).

Economists conduct research by emphasizing institutional quality's role in economic performance and the abundance of Foreign Direct Investment (FDI) (Ciftci & Durusu-Ciftci, 2022). This idea stems from the fact that FDI is usually targeted at market-oriented countries (e.g. US, UK, Hong Kong) that require good institutional infrastructure to function well. Therefore, there is an argument that the growth impact of Foreign Direct Investment (FDI) may depend on certain institutional factors that enable host countries to absorb the benefits of FDI spillovers (Hayel & Saiydy, 2021). Policies such as the protection of personal and property rights, the rule of law, free competition, free trade, and voluntary changes that must be implemented to increase economic freedom are also recommended to stimulate the inflow of Foreign Direct Investment (FDI) and economic growth. Since the Northern Study, to measure the relative quality of institutions between countries, many fields involved in law, politics, and economics have been used as variables as indicators of institutional quality. In the early years of the twenty-first century and the establishment of regular data, the economic freedom index began to be frequently used in empirical analysis to measure IQ (North, 1989).

Regarding the investigation of bilateral relations, which is a fundamental research question. In this research, previous empirical literature provides several bivariate causal analyses of the relationship between each pair of EF, Foreign Direct Investment (FDI), and economic growth. The results of these studies also vary depending on the sample, method, and whether the economic freedom data is aggregate or combined categorical data. For example, Bilas (2020) shows that the relationship between GDP growth rate and Foreign Direct Investment (FDI) growth rate is only indirect in EU countries13. Chanegriha et al., (2020) using data from 136 countries, reported that there is no clear support for a causal relationship between Foreign Direct Investment (FDI) and economic growth in most of the samples, Tanna & Topaiboul (2014) Trade openness has a more significant role than Foreign Direct Investment (FDI) in influencing Thailand's economic growth. Empirical research on the bilateral causality relationship between economic freedom and economic growth also reveals ambiguous findings. Using all available data from the Heritage Foundation, Heckelman (2019) reported that although many sub-components of the economic freedom index caused growth, reverse causality only existed for government intervention, and no relationship between taxation and trade policy was found. Likewise, Vega-gordillo (2014) regarding foreign investment in the world.

Since 1990, the world has witnessed a period in which economic output increased at an accelerated rate, institutional quality became important, and foreign direct investment (FDI) increased rapidly (Ciftci & Durusu-Ciftci, 2022). Therefore, based on the facts above, this research aims to analyze the impact and relationship between Foreign Direct Investment (FDI), economic growth, and economic freedom because the information and results of this research will be useful for policymakers in determining national policies. In this study, we focus on the Comprehensive Economic Partnership (RPEC) countries consisting of Australia, Brunei, Cambodia, China, Indonesia, Japan, Laos, Malaysia, Myanmar, the Philippines, Singapore, South Korea, Thailand, Vietnam, and New Zealand during the period 1997–2022 which has implemented various economic policies to encourage economic growth, including through increasing economic freedom and liberalization to attract foreign direct investment (Afdal Mubarak & Endraswati (2023); Setyono et al., (2023)).

This study tries to contribute three important aspects in detecting the direction of causality between economic freedom, Foreign Direct Investment, and economic growth in RECP countries. First, the results of the empirical analysis that focuses on RPEC countries will provide a new contribution to the discussion between the hypothesis of the relationship between economic freedom and Foreign Direct Investment, the relationship between Foreign Direct Investment (FDI) and economic growth, and the relationship between economic growth and economic freedom. As we know, the causal direction between economic freedom, economic growth, and FDI is an unresolved issue in the literature and therefore the issue requires further investigation in RPEC countries. second, investigating the causal relationship between economic freedom, FDI and economic growth has significant implications for policymakers in RPEC countries to design growth-oriented policies. Thus, the results of our research will serve as an important basis for the implementation of economic growth policies that depend on economic freedom and foreign physical capital inflows in RCEP countries. Third, our study brings significant differences in the econometric methods used compared to other studies in the literature. Existing empirical research on the direction of causality between economic freedom, FDI and economic growth mostly uses standard Granger linear causality type tests to detect the direction of causality between variables (Ciftci & Durusu-Ciftci (2022); Sampson & Faga (2021); Tanna & Topaiboul (2014); Ghazalian & Amponsem (2018); Mose & Kipchirchir (2024)). However, our research adopts a different methodological approach, namely Tanoe (2021) using the Vector Error Correction Model. Therefore, this research seeks to make a significant contribution regarding the effects of long-term and short-term relationships, Ordinary Least Square regression, and Granger causality relationships to determine the significant impact of FDI and economic freedom on economic growth. Thus, this research is expected to be an important guide in terms of methods that will be used in other econometric studies that will be carried out on similar subjects in the same region.

RESEARCH METHODS

We test and analyze the causal relationship between EF, FDI, and EG in RECP countries in the period 1997-2022. Our sample consists of 14 countries, namely: Japan, Australia, South Korea, China, New Zealand, Singapore, Malaysia, Thailand, Indonesia, Myanmar, Philippines, Vietnam, Laos, and Cambodia. The period is

driven by the availability of EF (Economic Freedom) data which is measured from sub-components consisting of (i) Rule of law (property rights, judicial effectiveness, and government integrity), (ii) Size of government (tax burden, government spending, and fiscal health), (iii) Regulatory efficiency (freedom of enterprise, freedom of employment, and monetary freedom), and (iv) Market openness (trade freedom, investment freedom, and financial freedom) is measured by the freedom ratio, while FDI is measured by the amount of net FDI inflows which are part of GDP, and EG is measured by the amount of GDP per capita. Data was obtained from the World Development Indicators database of the World Bank and the Regional Comprehensive Economic Partnership (RCEP).

To choose the right method, we start with several steps carried out in the test stages – Granger Causality and VECM, namely:

a. Carry out the first processing of the collected data through data transformation (EF, FDI, and EG)
b. Carrying out stationary tests through unit root tests, with several tests; at level level, first difference level, and so on.
c. Next, carry out a cointegration test implemented by Johansen RR. To get the cointegration relationship between variables.
d. After that, a Granger causality test was carried out, to see the causality of the relationship between variables, then continued by examining the results of the Impulse Response Function (IRF), useful for seeing the response between dependent variables in the VAR system to shocks in error terms and Forecast Error Variance Decomposition (FEVD). The FEVD is used to see the magnitude of the influence contribution of each variable as seen from the estimated error variance of the test variable.

Preliminary analysis: Cross-sectional dependence and heterogeneity

Before proceeding with the empirical analysis, we need to define some econometric models. First, we analyze whether there is cross-sectional dependence across countries; this is especially important to examine panel data because ignorance of the dependence across members could result in substantial bias and size distortion (Pesaran et al., 2008). Due to increasing integration among countries through globalization, shocks experienced by one country can affect other countries as well. Therefore, we start by performing a series of cross-sectional dependency tests proposed by Pesaran et al., (2008) and Breusch & Pagan (1980):

$$LM = T \sum_{i=1}^{N-1} \sum_{j=i=1}^{N} \hat{\rho}_{ij}^{2} \quad \ldots\ldots (1)$$

Where $\hat{\rho}_{ij}^{2}$ displays the estimated pair-wise correlation coefficients among the residuals obtained via individual OLS estimation. The null hypothesis (H_0) of this test indicates there is no cross-sectional correlation, and this is true for a relatively small number of cross-sections (N) and a fairly large period (T). Pesaran et al., (2008) developed the following cross-sectional dependency test (called the CD_{LM} test) for large panels where first T → ∞ and then N → ∞

$$CD_{LM} = \left(\frac{1}{N(N-1)}\right)^{1/2} \sum_{i=1}^{N-1} \sum_{j=i=1}^{N} (T\,\hat{\rho}_{ij}^{2} - 1) \quad \ldots\ldots (2)$$

However, the CDLM test tends to show substantial size distortion when N is large and T is small. Therefore, Pesaran et al., (2008) proposed another cross-sectional dependency test applicable to panels where T → ∞ and N → ∞ in any order. The CD test has the following form:

$$CD = (\frac{1}{N(N-1)})^{1/2} \sum_{i=1}^{N-1} \sum_{j=i=1}^{N} (\hat{\rho}_{ij}^{2} - 1) \ldots \ldots \ldots (3)$$

Panel bootstrap Granger causality test

In the Granger panel causality approach (1969) proposed by Granger (2008) in the Multivariate case, to analyze the causal relationship between the time series of variables EG – FDI and FDI - EG, EG – EF and EF - EG, as well as FDI – EF and EF - FDI requires estimating the following system of equations:

$$EG_t = \propto + \sum_{k=1}^{k} \gamma_1 EG_{t-k} + \sum_{k=1}^{k} \beta_k EF_{t-k} + \varepsilon_t \ldots \ldots (4)$$

$$EF_t = \propto + \sum_{k=1}^{k} \gamma_1 EF_{t-k} + \sum_{k=1}^{k} \beta_k FDI_{t-k} + \varepsilon_t \ldots \ldots (5)$$

$$FDI_t = \propto + \sum_{k=1}^{k} \gamma_1 FDI_{t-k} + \sum_{k=1}^{k} \beta_k EG_{t-k} + \varepsilon_t \ldots \ldots (6)$$

Where FDI is measured by net FDI inflows as a share of GDP, EG is measured by GDP per capita (constant 2015 US $) and Economic Freedom (EF) is the overall score of the EF sub-component index. The i represents the number of countries (i=1, ..., N), t represents the time, and k is the lag length (Lopez & Weber, 2017).

Test – Vector Error Correction Models (VECMs) by Johansen (1988)

Calculating the Vector Error Correction Model (VECM) from the Johansen Procedure. The Johansen RR procedure can be used to estimate the following model:

$$\Delta y_t = \alpha \beta^* \begin{bmatrix} y_{t-1} \\ D_{t-1}^{\infty} \end{bmatrix} + \Gamma_1 \Delta y_t + \cdots + \Gamma_p \Delta y_{t-p} + CD_t + u_t \ldots \ldots (7)$$

Information on the symbol β* is automatically normalized as follows:

$$\beta^* = \begin{bmatrix} I_r \\ \beta^*_{(k^*-r)} \end{bmatrix} \ldots \ldots (8)$$

Where β* (K* - r) is the matrix ((K* - r) x r). This normalization requires that the order of variables be determined in such a way that the first r variables are involved in the cointegration relationship. In other words, a meaningful cointegration relationship must be generated through the normalization of values between variables. If the procedure of Johansen (1988) is used for estimation, the probability of testing the bounds of the form becomes:

$$H_0 = R_{vec}(\beta^*_{(k^*-r)}) = r \quad versus\ H_1 = R_{VEC}(\beta^*_{k^*-r}) \neq r \ldots \ldots (9)$$

If there are J linearly independent constraints for the coefficient β*(K*-r), the meaning of R is the matrix (Jx(K*-r) r) and r is a vector of dimension J. Meanwhile, in the Wald test it will be used with the distribution X2 (J). Although the existence of restrictions on the cointegration relationship between variables can be tested based on the Johansen estimator, likely, JmuITi does not apply restrictions in the RR estimation procedure (Lutkepohl & Kratzig, 2005).

RESULT AND DISCUSSION

Data Analysis Findings

Test analysis - Lagrange Multiplier (LM)

To determine the appropriate model, we began by investigating the empirical literature from the overall EF score as well as four sub-components, namely: (i) Rule of law (property rights, judicial effectiveness, and government integrity), (ii) Size of government (tax burden, government spending, and fiscal health), (iii) Regulatory efficiency (freedom of enterprise, employment freedom, and monetary freedom), and (iv) Market openness (trade freedom, investment freedom, and financial freedom) as measured by the freedom ratio. Through dependency tests from the Breusch-Pagan LM test, Pesaran scaled LM, Bias-corrected scaled LM, and Pesaran CD.

Table 1. Cross-sectional dependency test results

	Overall score (OS)	Rule of Law (RoL)	Government size (GSz)	Regulatory Efficiency (Ref)	Market Opnness (MoP)
Breuxh-Pagan LM	426.8549	519.8933	366.1007	336. 1007	258.2599
Pesaran scaled LM	25.04347	31.79169	20.39182	18.17557	12.39183
Bias-corrected scaled LM	24.76347	31.51169	20.11182	17.89557	12.11813
Pesaran CD	14.06855	13.98781	10.37623	9.445791	6.786029

Note Economic Freedom: OS (overall score), RoL (Rule of Law), GSz (Government Size), ReF (Regulatory Efficiency), and Mop (Market Openness), showing a significant probability of 0.0000 < 0.05 (heteroscedasticity). Conclusion: The data is homoscedastic (there is no dependence on the Economic Freedom variable between countries/regions)

The results of the Breusch – Pagan LM, Pesaran scaled LM, Bias–corrected scaled LM, and Pesaran CD analyses show that the null hypothesis results at a probability value of 0.0000 < 0.05 = rejects H_0 (heteroscedasticity), or there is no cross-sectional dependence. These results indicate that overall panel data members are rejected for all models and are homoscedastic. Further research from Cifti shows the results of the method of Pesaran et al., (2008) that the results of the slope and adj homogeneity tests obtained significantly reject the null hypothesis, and support country-specific heterogeneity (Ciftci & Durusu-Ciftci, 2022). In addition to the empirical evidence that has been carried out by previous research, we consider the cross-sectional dependence and slope of Causality tests and VECM (Vector Error Correction Models) measured in the short and long term. This result is assumed by assessing Cointegration from (Johansen, 1988), and there is a cointegration relationship between variables. So the next step is to carry out a Granger causality test to see the causality of the relationship between variables, then continue by checking the results of the Impulse Response Function (IRF), which is useful for seeing the response between dependent variables in the VAR system to shocks in error terms and Forecast Error Variance Decomposition (FEVD). The FEVD is used to see the magnitude of the influence contribution of each variable as seen from the estimated error variance of the test variable.

Stationary-test results

The next stage is to carry out a unit root test using the Levin, Lin, and Chu method with the null hypothesis that the data has a unit root (not stationary). The

results are shown in **Table 2**. The table shows statistical data for the stationary unit root test at first difference 2 with a ρ-value <0.005 (stationary) from which it can be concluded that FDI, EF, and EG are stationary at first difference 2 by giving the symbol (**) in the probability column. More details can be seen in the following table:

Table 2. Analysis Of Stationary And Non-Stationary Data Output At The Stationary Level At The Level

Variable	Level	Statistics	Prob**	Cross-section	Obs
FDI	Level	-2.65667	0.0039	14	336
	First Difference 1	-12.0507	0.0000	14	322
	First Difference 2	-15.3142	0.0000**	14	308
EG	Level	-9.50791	0.0000	14	336
	First Difference 1	-12.1011	0.0000	14	322
	First Difference 2	-12.6309	0.0000**	14	308
EF	Level	-0.58486	0.2793	14	336
	First Difference 1	1.34997	0.9115	14	322
	First Difference 2	-4.61897	0.0000**	14	308

***Source**: Data obtained from Worldbank (FDI and EG) and Economic Freedom data: Heritage Foundation which consists of four sub-components*

Cointegration test analysis results

After carrying out the stationary test, the next stage is to use the cointegration test on each EG-FDI-EF variable, as follows:

Table 3. Analysis of EG-FDI- EF cointegration test

Variable	Hypothesize d no.OfCE(s)	Eigen Value	Trace Statistic	0,01 Critical Value	0,05 Critical Value	0,1 Critical Value	Proob**
EG-FDI	None*	0.496585	393.1596	19.93711	15.49471	13.42878	0.0000
	At most1*	0.445757	181.7667	6.634897	3.841465	2.705545	0.0000
FDI-EF	None*	0.458157	246.8835	19.93711	15.49471	13.42878	0.0000
	At most1*	0.171241	58.14767	6.634897	3.84941465	2.705545	0.0000
EF-EG	None*	0.486849	262.0028	19.93711	15.49471	13.42878	0.0000
	At most1*	0.167626	56.50996	6.634897	3.841465	2.705545	0.0000

***Note**: Trace test indicated 2 cointegrating eqn(s) at the 0.1, 0.05, and 0.01 levels*
***Denote rejection of the hypothesis at the 0.1, 0.05, and 0.01 levels*
**** MacKinnon-Haug-Michelis (1999) p-value*

In the previous test results, the AR Roots table output was stable (with a modulus value of less than one. The table above shows the results of the Johansen cointegration test that there is cointegration at the level α=0.01,=0.05=0.1 so the next stage of Testing can be carried out using the VECM method.

Table 4. Results Of Cointegration Analysis Of The Relationship Between Variables Using The Johansen Model

Country	FDI-EF	EG-EF	EG-FDI
Australia	4.5161*	3.2353	11.3969*
Myanmar	3.7686	4.5263*	7.8788*
Cambodia	14.5780*	10.1570*	9.3180*

China	0.0073	1.0350	10.6206*
Indonesia	4.6608*	8.3344*	8.2828*
Japang	10.1807*	12.1839*	13.1530*
Laos	2.9867	5.0373*	12.3850*
Philippines	6.2874*	7.2994*	13.1530*
Singapore	2.5914	3.3201	12.9306*
South Korea	10.4815*	10.4679*	22.4677*
Thailand	3.9631*	3.0682	14.4928*
Vietnam	8.5929*	11.7935*	13.7866*
New Zealand	4.3481*	8.7377*	10.9663*
Malaysia	0.8592	0.9519	20.1217*

Note(s): *, **, and *** denote the significance levels at 1, 5, and 10%

The results above, show that the relationship between the variables EG, FDI, and EF has a mutually cointegrated relationship and is not determined in a 25-year time series. Based on the results of the analysis data, it is clear that: Cambodia, Indonesia, Japan, the Philippines, South Korea, Vietnam, and New Zealand have a cointegration relationship in short-term and long-term time series for all variables marked (*). Meanwhile, in China, Singapore, and Malaysia, each variable is more unintegrated than cointegrated. China shows cointegration between the Freedom economy and FDI with a P-value of 10.6206*, Singapore has cointegration between the Freedom economy and FDI with a P-value of 12.9306*, and Malaysia has a similar relationship to the previous two countries where there is cointegration through the Freedom economy and FDI with a P-value of 20.1217*. Based on the results above, it show that time series can influence the relationship between variables in each country. As mentioned previously, it is generally accepted that a higher Engagement Rate (ER) index value can compensate for a country that is less regulated and more open, thereby helping to encourage FDI inflow to the host country. However, the economic freedom index consists of many different sub-components such as the rule of law, regulation, size of government, and market openness (Ciftci & Durusu-Ciftci, 2022). The direction of causality starts from EF to EG. It would be better if the unidirectional causality relationship from EG to EF looks more directed towards developing countries in the panel table above. This may be in line with Sayari et al., (2017) and Ciftci & Durusu-Ciftci (2022) which states that a country's economic growth is based on the amount of demand from households and companies which can result in economic freedom from policymakers, in this case, the government of a country.

Regarding the relationship between FDI and EG, we found that EG only causes FDI in South Korea with a P-value of 22.4677* where the overall score of the EF index is used as an auxiliary variable. However. The nexus also applies to Australia, Hong Kong, China, Thailand, and Malaysia when considering different components of the freedom index. In addition, many causal relationships from FDI to EG can also be established if different sub-components of the EF index are used (Chanegriha et al., 2020).

Vector Error Correction Model (VECM) test analysis results

In the results of this VECM test research, we will explain the short-term and long-term relationships between the EG, FDI, and EF variables.

Table 5. VECM EG-FDI-EF test analysis results

Variable	Co-efficient	Std.Error	t-stat
Long Run Result			
D(EF(-1))	-0.10663	(0.8991)	[-1.18602]

D(EG(-1))	-84.11236	(6.05220)	[-13.8978]
D(FDI(-1))	8.091547	(8.10644)	[0.99816]
Short Run Results			
COINTEQ1	-0.445896	(0.07160)	[-6.22757]
D(EF(-1),2)	-0.665389	(0.06471)	[-10.2824]
D(EF(-2),2)	-0.445896	(0.07160)	[-6.22757]
D(EF(-3),2	-0.169857	(0.06256)	[-2.71528]
D(EG(-1),2)	-0.433624	(0.10550)	[-4.11020]
D(EG(-2),2)	-0.214960	(0.07698)	[-2.79238]
D(EG(-3),2)	-0.075188	(0.04005)	[-1.87722]
D(FDI(-1),2)	0.011113	(0.03948)	[0.28147]
D(FDI(-2),2)	-0.038139	(0.05050)	[-0.75524]
D(FDI(-3),2)	-0.071902	(0.03797)	[-1.89349]
C	-0.141573	(0.11404)	[-1.24142]

Based on the Vector Error Correction Model (VECM) test data, it can be concluded that there is or is not a short-term and long-term influence of each variable. Increasing EF units produces a significant increase of 1.18602 <1.966824 units in EG. This means that Ef on EG has a long-term influence. The results of this study are in line with the findings (Ofori et al., (2023); Singh & Gal, (2020); Heckelman (2019)). Further findings reflect that economic growth has no relationship with FDI with a value of 13.8978> 1.966824. this finding is contradictory. which states that the greater a country's investment, the greater the level of economic growth that can be achieved. Our research results also show that the use of FDI has a significant positive impact on EF. Increasing economic freedom in a country and guaranteeing legal supremacy will increase FDI in that country. These results are under research findings (Singh & Gal, (2020);Sayari et al., (2017)). Meanwhile, in the short term, it influences the relationship between FDI, Economic Freedom, and overall economic growth, so the findings in this study are in line with the research results (Imam Awaluddin, et al., 2023).

Granger causality analysis results

The following are the results of the Granger causality test data:

Table 6. Granger causality analysis results

Null Hypothesis:	Obs	F-Statistic	Prob.	
EG does not Granger Cause FDI	196	2.74452	0.0037	There is a causal relationship between EG and FDI $\alpha > 0.0037$
FDI does not Granger Cause EG	196	1.38646	0.1899	There is no causal relationship between FDI and EG $\alpha < 0.1899$
FDI Idoes not Granger Cause EF	196	0.84843	0.5828	There is no causal relationship between FDI and EF $\alpha < 0.5828$
EF does not Granger Cause FDI	196	0.79948	0.5828	There is no causal relationship between EF and FDI $\alpha < 0.5828$
EG does not Granger Cause EF	196	1.64730	0.0989	There is no causal relationship between EG and EF $\alpha < 0.0989$

EF does not Granger Cause EG	196	3.39109	0.0005	There is a causal relationship between EF and EG $\alpha > 0.0005$

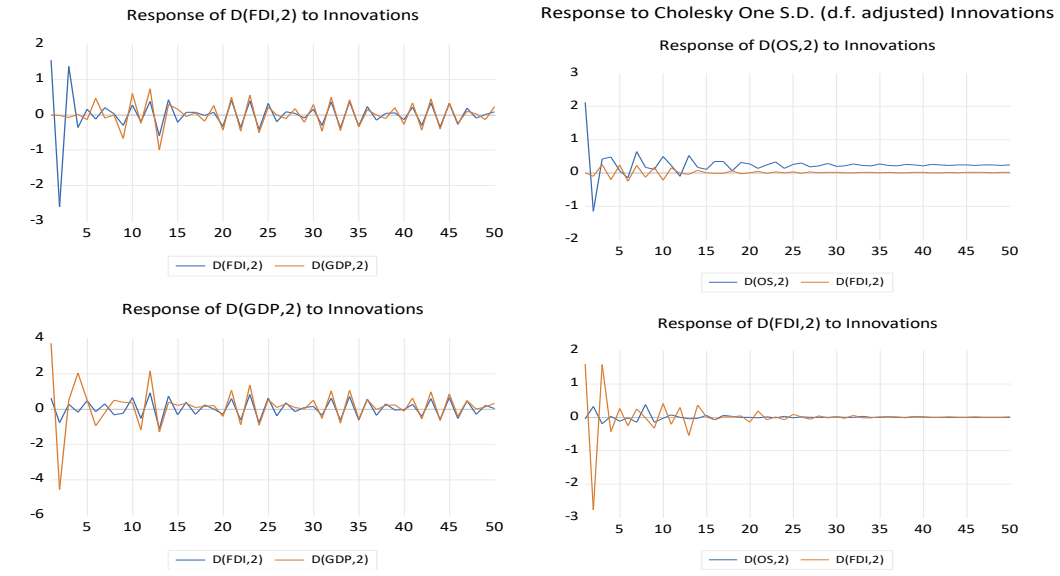
Note: *data source in Table 2*

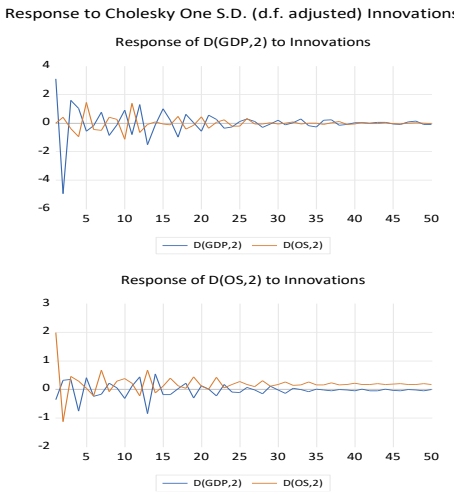
The table above explains whether there is or is not a causal relationship between EG-FDI-EF. The conclusion from the table above is that there are two reciprocal relationships between the two. The causal relationship between economic growth and FDI with a value of α>0.0037, thus it can be understood that foreign capital investment in real GDP income is highly reciprocal in RPEC countries and likewise for economic freedom and economic growth there is a reciprocal relationship with the value of α >0.0005, so it can be understood that economic freedom is closely related to economic growth in that country. Unidirectional causality from FDI to EF does not occur or can be understood as the absence of a causal relationship between FDI and EF and no causal relationship between EF and FDI, which is in line with research (Sayari et al., 2017). Then Justesen (2008) and Heckelman (2019) found unidirectional causality from the overall score of the EF index to EG. In other cases, the neutrality hypothesis is supported, meaning that there is no causal relationship between EF and EG. However, in contrast to the causal relationship between EG and Ef, there is a causal relationship, so our findings are in sharp contrast to previous literature (for example, (Basu et al., (2003); Tanna & Topaiboul (2014); Chowdhury & Mavrotas (2006); Ghazalian & Amponsem (2018)) which mostly found that FDI does not have a two-way relationship with EG. Positive shocks to economic growth significantly led to FDI in 14 countries (China, Indonesia, Japan, Laos, Malaysia, Myanmar, Australia, Cambodia, New Zealand, Philippines, Singapore, South Korea, Thailand and Vietnam). However, the relationship between FDI and economic growth does not have a causal relationship, so this research is in line with research by (Sopta et al., 2021), (El-Halaby et al., 2023), (Herzer et al., 2008).

Results of Impulse Response Function (IRV) and Forecast Error Variance Analysis Decomposition (FEVD).

Impulse Response Function (IRV)

Figure 1. Impulsive Response Function (IRV) analysis results





Source: Data obtained from Worldbank (FDI and EG) and Economic Freedom: Heritage Foundation data which consists of four sub-components and processed from the Eviews12 application.

From the results of processing the IRF graph above, it can be concluded that there is a response in each EG, FDI, and EF which has quite stable shocks. Shocks to FDI and GDP had up and down shocks which in period 5 rose quite significantly but in the following periods, they rose and fell but tended to remain stable at the threshold.

Likewise, the EF and FDI variables show fluctuations throughout the period, although there is slight fluctuation, but in the following period they tend to be more stable and positive. The variables EG and EF experienced fluctuations from the beginning of the period to the twenty-fifth period but tended to be stable in the following period in the long term.

Forecast Error Variance Decomposition (FEVD).

Variance decomposition analysis known as Forecasting Error Variance Decomposition (FEVD) or Variance Decomposition is used to calculate and analyze how large random shocks from certain variables are to endogenous variables or used to predict the percentage contribution to the variance of a variable. each variable results from changes in certain variables in the system. FEVD produces information about the relative importance of each random innovation or how strong a variable's role composition is relative to other variables in the VAR/VECM model. More importantly, FEVD can also find out which variable shocks have an important role in explaining changes in other variables.

The FEVD test results for the 50 years in the table above can be analyzed in that the composition of the variance in the FDI variable is mostly dominated by the FDI variable itself, at the beginning of the period and the thirteenth it shows a high composition, but over time the percentage decreases. Second, there is EF with its compositional contribution which shows increasing numbers but fluctuates up to period 25 after which it tends to stabilize. The three EGs with the highest variance composition in the 13th and 15th periods.

CONCLUSION

This study investigates the causality and short-term and long-term relationships between economic growth, foreign direct investment, and economic freedom in RECP countries consisting of 14 countries from 1997-2022. To reveal the impact of various components of the economic freedom index, we expand Our analysis using four indicators of economic freedom. The findings of this research were through

dependency tests from the Breusch-Pagan LM test, Pesaran scaled LM, Bias-corrected scaled LM, and Pesaran CD.

The results of this research are further research from Ciftci & Durusu-Ciftci (2022) which shows the results of Pesaran et al., (2008). the cross-sectional dependence and slope of the Causality test and VECM measured in the short and long term. This result is assumed by assessing Johansen's Cointegration, and there is a cointegration relationship between variables. So the next step is to carry out a Granger causality test to see the causality of the relationship between variables, then continue by checking the results of the Impulse Response Function, which is useful for seeing the response between dependent variables in the VAR system to shocks in error terms and Forecast Error Variance Decomposition.

The FEVD is used to see the magnitude of the influence contribution of each variable as seen from the estimated error variance of the test variable. The next findings show that the relationship between the variables EG, EF, and FDI has a mutually cointegrated relationship and is not determined in a 25-year time series. The results of our data analysis show that Cambodia, Indonesia, Japan, the Philippines, South Korea, Vietnam, and New Zealand have a cointegration relationship in short-term and long-term time series for all variables marked (*). Meanwhile, in China, Singapore, and Malaysia, each variable is more unintegrated than cointegrated. Meanwhile, in our assessment in the form of graphs and tables shown in the IRF and FEVD models, during the 50 years in the table above it can be analyzed that the variance composition of the FDI variable is mostly dominated by the FDI variable itself, at the beginning of the period and the thirteenth it shows the composition high, but over time the percentage decreases. Second, there is EF with its compositional contribution which shows an increasing number but fluctuates up and down until the 25th period after which it tends to stabilize. The three EGs with the highest variance composition in the 13th and 15th periods.

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