

FRESH EVIDENCE ON THE INVESTMENT-ECONOMIC FREEDOM- GROWTH NEXUS IN OECD MEMBER STATES

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ABSTRACT

This paper aims to explore the nexus between investment, economic freedom and economic growth in the sample of 35 OECD member states in the time span 1996-2015. The empirical methodology relies on the panel VAR model. The findings of trivariate model suggest a significant negative response of GFC to EFI. Investment is however found to respond positively to the improvements in real GDP per capita. With regard to GDP it is found to respond negatively to the GFC as well as EFI. Lastly, economic freedom is found to respond negatively to GFC but positively to GDP. IRFs display the response of EFI to GDP to be negative only in the short-run reaching the positive value at the end of the period of interest. Similar conclusion can be drawn for the response of EFI to GFC. GDP is found to have a positive response to the EFI in both, short- and the long-term. Similar conclusion can be drawn for the response of GDP to GFC. GFC positively responds to and to GDP. This paper suggests a necessity for policy makers to support the economic freedom since it has a great potential to contribute to the both, investments and final the economic growth of the countries of interest.

Keywords: *economic freedom, economic growth, investment, panel VAR*

1. INTRODUCTION

The empirical evidence on the link between economic output and institutions is given by many authors (Sirowy and Inkeles, 1990). However, Doucouliagos and Ulubasoglu (2006) suggest that the relationship between economic freedom and economic output has not been explored quite extensively. Apart from that, there is a general consensus on the positive impact of economic freedom on economic output. Besides that, economic freedom is considered to be one of the most important pillars of the institutional structure of some country. Taking into account the challenges assigned with the economic growth, the understanding of the role of institutions is essential. Since the economic freedom is a component of institutional structure, the understanding of its role in economic growth is crucial. Every person needs to have the economic freedom, e.g. every human should have a right to govern its own activities and equity. In societies that experience the high level of economic freedom, human works and produces freely. Besides that, economically free societies enable individuals to invest in the way they like. Thus, there are many benefits of economic freedom including higher accomplishment, promoting the achievement of socio-economic objectives, human development, the reduction of poverty, increasing the standard of living and the protection of environment (Satrovic, 2017). This is due to the fact that human free to produce tends to come up with new ideas and to offer new products that can enhance the quality of the life. Taking this into account, the economic freedom tends to contribute significantly the investment approximated using gross capital formation as well as the real GDP per capita, what was the motivation to conduct this research.

The fact that the definition of economic freedom is the matter of discussion in research community and the lack of data supporting the definition are lacking, can explain the potential poor empirical evidence on the link between economic freedom and economic growth. However, the meaningful steps were taken in the end of 20th century to measure and define the economic freedom. For instance, Gwartney et al. (1996) outlines the importance of the index developed by the Fraser Institute while Holmes et al. (1998) highlights the importance of the index introduced by The Heritage Foundation. For the purpose of this analysis, we propose the Economic Freedom Index introduced by The Heritage Foundation. This index measures economic freedom for more than 20 years. It consists of twelve freedoms and covers the sample of 186 countries. To obtain the overall score, every 12 freedoms are graded. The scale includes the points from 0 to 100. These values are then averaged using the equal weight to obtain the overall score, e.g. every freedom is considered equally important. Thus, The Heritage Foundation suggests that these countries that take into account the economic reforms that will lead to the improvements in economic freedoms may benefit significantly from the opportunities to improve the economic output. On the other way, investment is expected also to have a significant positive impact on the economic growth. This is since it tends to increase the production possibilities and consequently employment opportunities that will lead to economic growth and increase the standard of living. The proxy variable of investment in this paper is the gross capital formation indicating the investment level in some country (Rajni, 2013). Investment is strongly connected with the savings. Thus by reducing the consumption in present, the savings opportunities are increased. It is believed that savings will support the investments that will boost the income and consumption in the future. Capital formation is also believed to be one of the key factors of the abilities of some economic to produce income. Rajni (2013) defines the capital formation as the rise in capital stock. Thus, it tends to increase income, the opportunities for employment and economic output in the countries. Moreover, if the inequality in income distribution is minimized, it will lead to the elimination of poverty. Besides that, capital formation tends to have a significant positive impact on the international trade. With regard to the international export, it is important to emphasize the fact that it can decrease the dependence on other economies. Thus, capital formation is believed to be one of the key factors of the improvement in economic output. Capital formation actually includes the amounts of money that private and public sectors invest in capital (equipment, buildings, machines etc.). With regard to the link between investments and economic freedom, it is important to emphasize that the countries with the high levels of the key dimensions of economic freedom are expected to gain more from spillovers in investment. There are few supportive arguments. First, Azman et al. (2010) suggest that less regulation tends to foster the progress of economy. This is since open market enables entrepreneurs to come up with innovative ideas. Moreover, the firms are eager to accept riskier business in a search for higher returns. The second argument is connected with the labor market. Strict regulations may prevent workers trained by foreign companies connected with foreign investments to enter local firms; the spillover effect is thus reduced. Property rights are also of the great importance. Multinational corporations prefer to launch their FDI to the countries where property rights are highly protected since these markets enable the development of R&D activities (Nunnenkamp and Spatz, 2004). With regard to previous paragraphs, this paper aims to analyze the link between these three economic terms of interest. It is expected to contribute to the research to date in a line that it takes into account the interdependencies between all three variables of interest, introduces the latest available data, analyzes impacts in both, short- and the long-term and suggests the significant policy implications. In addition, this paper provides important insights for policy makers supporting the need to contribute to the main dimensions of economic freedom since the spillover effects tend to be positive in terms of investments as well as economic growth.

This paper will present the overview of literature to the on the link between variables of interest. It will also present the methodology to be employed together with the explanation of the data and variables. The results section will display the empirical research together with the discussion of the obtained results. The last chapter will summarize the concluding remarks.

2. LITERATURE REVIEW

The macroeconomic role of economic freedom did not obtain much attention among research community what was the motivation to conduct this research and to explore the nexus between economic freedom, investment and growth. Thus, this part of the paper summarizes the empirical evidence on the matter. Azman et al. (2010) have explored the link, if any, between FDI, growth and economic freedom. For this purpose they have collected the annual panel data for the sample of 85 economies. In terms of methodology, they have employed GMM. The findings suggest no significant impact of FDI on economic growth. However, this impact is conditional on economic freedom. Thus, those countries with higher level of economic freedom tend to attract more foreign direct investors. These findings are also supported by Barro (2000) indicating that the countries that pay much attention to the promotion and protection of property rights tend to attract foreign direct investments and thus to increase the growth performance. Doucouliagos and Ulubasoglu (2006) have employed the meta-analysis to explore the literature to date on the link between economic freedom and growth. The authors suggest a positive impact of economic freedom on growth. Besides this direct impact, the authors provide the evidence on the positive indirect impact over physical capital. Przeworski and Limongi (1993) have also proposed economic freedom to be an important determinant of growth. Thus, the models that do not take into account this macroeconomic variable are assumed to be misspecified. Xu (2018) promotes the economic freedom to be essential for operating a business. In addition it is recognized to be as an important determinant of foreign direct investments. They have collected the data for 155 countries and employed the gravity model. The results suggest a significant positive correlation between economic freedom and foreign direct investments. This result is found true in the sample of developing countries by Kapuria-Foreman (2007). Additionally, the positive correlation between the economic freedom and foreign direct investments is found true for the sample of East Asian countries by Quazi (2007). Al Najjar (2002) has investigated the determinants of economic growth. The results suggest a significant positive impact of economic freedom on economic growth. Thus, the results are found to be consistent with the general conclusion on the positive link between economic freedom and economic growth. This is since high levels of economic freedom stimulate the investment and enhance the trade and monetary freedom in the country. Besides that, propose the economic freedom as a key determinant of economic growth. These findings are consistent with Ayal and Karras(1998). De Haan and Siermann (1998) have explored the link between economic freedom and economic growth. They have tested the sensitivity of the results by employing a set of the measures of economic freedom. The findings suggest that the link strongly depends on the selection of the proxy of economic freedom. To measure the economic freedom they have used the indices proposed by Scully and Slottje (1991). Vukotic and Bacovic (2006) recommend the economic freedom as a significant determinant of economic growth since it reduces the barriers for business activities. It is assumed to have an indirect impact on economic growth since it tends to develop the institutional framework that is business friendly. To analyze the link between the economic terms of interest, the authors have proposed the various proxy measures of economic output suggesting the positive link. Pattanaik and Nayak (2014) have investigated whether or not the greater economic freedom contributes to the growth of Indian economy. The results suggest a positive impact of the key dimensions of economic freedom on economic growth. The findings are confirmed by Gwartney and Lawson (2003) suggesting the positive impact of economic freedom on both, economic growth and the national

income. With regard to the link between fixed investment and economic growth, Kwan et al. (1999) have explored this link in the case of China. The results promote the fixed investment as one of the most important determinants of economic growth in China. These findings are supported by Hao et al. (2018). In addition, Chen et al. (2008) suggest that investments tend to provide the better technology that is expected to increase energy consumption and promote the economic growth. Lastly, Abusomwan and Ezebuihe (2017) suggest that the economic output tends to be adequate determinant of the gross capital formation in the case of Nigeria over the period ranging between 1981 and 2014. These findings are supported by Jain and Baliyan (2014). The research to date provides mixed evidence on the link between economic freedom, economic growth and gross capital formation. In addition, it is important to emphasize that this link has not been explored quite intensively in the case of OECD countries what was the motivation to conduct this research. Taking into account the previous paragraphs, a positive link between variables of interest is expected.

3. METHODOLOGY AND VARIABLES

Panel VAR models are used in modern economic research due to their ability to deal with the heterogeneity among individuals (Abrigo and Love, 2016). Besides that, under the minimum restriction set, they enable the estimation of interdependencies that are dynamic. Additionally, impulse-response functions based on the structural form can be easily calculated by including the shocks. Due to its great popularity, the disadvantages of panel VAR models were explored quite extensively (Chari et al., 2008). Apart from the fact that there are some drawbacks, these models are expected to significantly contribute to DSGE models and are thus used to explore the link between many macroeconomic terms of interest. These models were proposed in 1980s (Sims, 1980). The idea was to introduce some option for SEM models. Very important feature is the assumption that all variables are endogenous. Taking into account the fact that this methodology is recently introduced in macroeconomic research, we have followed the methodological properties presented in Love and Zicchino (2006). Panel VAR model is very similar to the one that uses time-series data. The difference arises from the introduction of heterogeneity among individuals. Thus the panel VAR model to be estimated and interpreted in this paper can be summarized as following:

$$\begin{aligned}
 EFI_{it} &= \sigma + \sum_{i=1}^k \beta_i EFI_{t-1} + \sum_{j=1}^k \theta_j GFC_{t-j} + \sum_{m=1}^k \varphi_m GDP_{t-m} + u_{1t} \\
 GFC_{it} &= \alpha + \sum_{i=1}^k \beta_i EFI_{t-1} + \sum_{j=1}^k \theta_j GFC_{t-j} + \sum_{m=1}^k \varphi_m GDP_{t-m} + u_{2t} \\
 GDP_{it} &= d + \sum_{i=1}^k \beta_i EFI_{t-1} + \sum_{j=1}^k \theta_j GFC_{t-j} + \sum_{m=1}^k \varphi_m GDP_{t-m} + u_{3t}
 \end{aligned}$$

where the dependent variable is estimated as a function of lagged values of the variables in the models. The innovations are denoted by u . EFI (Economic Freedom Index) is a proxy of economic freedom. The data are collected on annual basis using the dataset of The Heritage Foundation. GFC denotes gross capital formation (% of GDP) and is used as a proxy of investment (Satrovic, 2018; Satrovic and Muslija, 2018). These data are collected from The World Bank datasets. Lastly, GDP is a proxy of economic growth obtained from The World Bank and can be defined as GDP per capita (constant 2010 US\$) (Muslija et al., 2018).

EFI is index while GFC is presented as a ratio, while GDP is expressed in constant 2010 US\$. To make data comparable, these variables are expressed in natural logarithmic form. With regard to the estimation, this paper suggests GMM method do be employed. Beforehand, it is necessary to control for the stationary properties of the variables and to determine the order of the panel VAR models. In order to choose the order of panel VAR models, we follow the propositions of Andrews and Lu (2001). The pair of vectors are expected to minimize the following model selection criteria (MMS):

$$MMS_{BIC,n}(k, a, b) = J_n(k_a^2, k_b^2) - (|b| - |a|)k^2 \ln n$$

$$MMS_{AIC,n}(k, a, b) = J_n(k_a^2, k_b^2) - 2k^2(|b| - |a|)$$

$$MMS_{HQIC,n}(a, b) = J_n(k_a^2, k_b^2) - Rk^2(|b| - |a|) \ln \ln n, R > 2,$$

where $J_n(k, a, b)$ is J statistics of over-identifying restrictions for panel VAR that is k -variate, has order a , sample size n and b lags that are the basis for moment conditions. Maximum likelihood based criteria are denoted by BIC (Bayesian information criteria); AIC (Akaike information criteria) and HQIC (Hannan-Quinn information criteria) respectively.

To conclude, the empirical research will proceed to the calculation and interpretation of Impulse-response functions (IRFs) as well as the forecast-error variance decomposition (FEVD). Tiwari et al. (2013) suggests that the link the variables of interest can be explored while assuming the other shocks to be constant. There was also the necessity to select the confidence bounds. For this purpose, 200 Monte Carlo simulations are selected. The results are not opposite to those obtained using 1000 Monte Carlo simulations.

4. RESULTS OF THE RESEARCH AND DISCUSSION

The results section introduces first the most important measures of summary statistics. Table one suggests the mean value of EFI to be 69.66%. The maximum reported value is 83.10% for Australia in 2012. The minimum reported value of 50.40% is recorded in Slovenia in 1996. Huge differences are reported among OECD member states in terms of economic freedom. With regard to investment, the maximum GFC value of 39.68% is reported for Korea in 1996. The minimum reported value of 9.82% is found for the case of Greece in 2015. These results are quite expectable taking into account the economic and political situations (wars, economic crisis etc.) in these countries in the years of interest. On average, GFC reaches the value of 23.44%. Lastly, with regard to the real GDP per capita, the maximum value is reported in the case of Luxembourg in 2007 while the minimum value is recorded in Colombia in 1999. The descriptive statistics suggests significant difference among 35 OECD member states in terms of the all variables of interest.

Table 1: The main measures of descriptive statistics

Statistics	EFI	GFC	GDP
Mean	69.66	23.44	35569.28
Sd	6.96	4.16	21369.34
Max	83.10	39.68	111968.00
Min	50.40	9.82	4629.50
skewness	-0.09	0.59	0.94
kurtosis	2.27	4.21	4.13
countries	35 (Appendix 1)		

Source: Author

As indicated in the methodological section, there is a need to test for the stationary properties of the variables. For this purpose, we propose the three commonly used unit-root tests. The stationary properties are tested in log levels as well as in first difference. Panel VAR model requires the variables to be I(1). Table 2 summarizes the results of the selected unit-root tests for the all variables of interest.

Table 2: The selected unit-root tests

Trend included in the model	lnEFI		D.lnEFI		lnGFC		D.lnGFC		lnGDP		D.lnGDP	
	Stat.	P-value	Stat.	P-value	Stat.	P-value	Stat.	P-value	Stat.	P-value	Stat.	P-value
Levin–Lin–Chu (LLC) t* test	-7.80	0.000	-22.88	0.000	-7.69	0.000	-15.38	0.000	-6.02	0.000	-11.94	0.000
Im–Pesaran–Shin test	-7.41	0.000	-20.22	0.000	-4.11	0.000	-12.99	0.000	0.41	0.659	-8.73	0.000
ADF – Fisher inverse chisquare	93.36	0.033	355.24	0.000	143.72	0.000	314.96	0.000	70.01	0.477	229.92	0.000

Source: Author

With regard to economic freedom, all three tests agree on the rejection of null hypothesis (all panels contain unit root) in the log level as well as in the first difference. Thus, this variable meets the assumptions of the panel VAR. The same holds true in the case of GFC variable. However, Levin–Lin–Chu (LLC) t* test reports that both, log level and the first difference of the GDP, are reported to be stationary. However, Im–Pesaran–Shin test and ADF – Fisher inverse chisquare suggest that the log value of GDP is found to contain unit root. Apart from these results, all of the three tests agree on the stationary properties of the first difference value of real GDP per capita. Hence, all of the three variables are reported to be stationary for a 1% level of significance in first difference and are thus meeting the requirements of the panel VAR model. To estimate the panel VAR model, there is a need to determine the order of the model. For this purpose, we follow the propositions of Andrews and Lu (2001). Thus, we have calculated the J statistics together with the p value and R square. Moreover, it is essential to have a number of moment conditions to be higher than the number of endogenous variables. Table 3 presents the results that help to choose the appropriate order of the trivariate PVAR model that will be estimated and interpreted below.

Table 3: The selection of the PVAR order

Order	CD	J	J p-value	MBIC	MAIC	MQIC
1	0.477917	54.59644	0.001285	-112.653	0.596436	-43.8805
2	0.522484	33.74841	0.013527	-77.7509	-2.25159	-31.9029
3	0.497825	14.66943	0.100426	-41.0802	-3.33057	-18.1562

Source: Author

The MBIC and MQIC criteria agree on the first-order panel VAR since the values of these criteria are the lowest in the first row. However, the MAIC reports the opposing results suggesting the third-order panel VAR. Taking into account the fact that two out of three criteria agree and that we use annual panel data, we consider the first-order panel VAR appropriate and use GMM to estimate the model. Table 4 shows the empirical results of the three bivariate panel VAR models.

Table 4: Bivariate VAR models

Independent variables	Dependent variables			D.lnGDP	D.lnEFI
	D.lnGFC	D.lnEFI			
Model 1: GFC and EFI			Model 2: GDP and EFI		
D.lnGFC _{t-1}	0.131 (0.055)**	-0.004 (0.024)	D.lnGDP _{t-1}	0.433 (0.053)***	0.078 (0.086)
D.lnEFI _{t-1}	-0.095 (0.063)	-0.248 (0.071)***	D.lnEFI _{t-1}	-0.042 (0.022)*	-0.231 (0.067)***
Model 3: GDP and GFC					
	D.lnGDP	D.lnGFC			
D.lnGDP _{t-1}	0.530 (0.074)***	0.377 (0.215)*			
D.lnGFC _{t-1}	-0.065 (0.025)***	0.052 (0.074)			

Note: ***, **, * significant at 1%, 5% and 10% respectively.

Source: Author

The first bivariate model suggests a significant positive response of GFC to its lagged value as well as significant negative response of EFI to its lagged value. Other responses are not found to be significant. The second model suggests a significant negative response of GDP to EFI. This results is expected in the short-run since many of the jobs that are as opposed to the properties of economic freedom can be canceled out and increase unemployment rate. However, the long-run impact is expected to be positive which will be explored using IRFs. Table 4 suggests a significant negative response of GDP to GFC while GFC is found to responses positively to GDP in model 3. The stability properties are also explored for all of the models of interest. The eigenvalues lower than one suggest that all of the models meet the stability properties. To explore for the potential causal link between the variables of interest we have employed the Granger causality test. The Table 5 suggests a unidirectional causal relationship running from EFI to GDP. Moreover, the results provide the evidence on the bidirectional causal link between GDP and GFC. The other causal relationships are not found to be significant.

Table 5: Bivariate models (VAR based Granger causality test)

Equation	Excluded	chi2	p-value
D.lnGFC	D.lnEFI	2.293	0.130
D.lnEFI	D.lnGFC	0.029	0.865
D.lnGDP	D.lnEFI	3.686	0.055
D.lnEFI	D.lnGDP	0.840	0.360
D.lnGDP	D.lnGFC	6.923	0.009
D.lnGFC	D.lnGDP	3.089	0.079

Source: Author

Since this paper focuses on a trivariable VAR model, we rather proceed to the estimation and interpretation of this model. The results are shown in the Table 6.

Table 6: A trivariable VAR model (GMM estimation)

Independent variables	Dependent variables		
	D.lnGFC	D.lnGDP	D.lnEFI
D.lnGFC _{t-1}	0.085 (0.073)	-0.063 (0.024)***	-0.056 (0.034)*
D.lnGDP _{t-1}	0.358 (0.205)*	0.583 (0.072)***	0.272 (0.129)**
D.lnEFI _{t-1}	-0.106 (0.058)*	-0.029 (0.022)	-0.250 (0.062)***

Source: Author

The findings suggest a significant negative response of GFC to EFI. This sign is expected in the short run since EFI can lead to the cancelation of the some business that are as opposed to the postulations of economic freedom. However, the response in the long-term is expected to be positive what will be explored further. Investment is however found to respond positively to the improvements in real GDP per capita. With regard to GDP it is found to respond negatively to the GFC as well as EFI. IRFs will used to explored whether this impact holds true in both, short- and long-term. Lastly, economic freedom is found to respond negatively to GFC but positively to GDP. Granger causality test presented in Table 7 suggests a significant causal link running from GDP and EFI to GFC. The joint impact of these two variables is also found to be significant. Moreover, a significant causal link running from GFC to GDP is also found. Additionally, joint link of GFC and EFI with GDP is found to be significant. Lastly, GFC and GDP are found to Granger cause EFI. However, joint impact is not found to be significant.

Table 7: Trivariate model (VAR based Granger causality test)

Equation	Excluded		
	D.lnGDP	D.lnEFI	All
D.lnGFC	3.033 (0.082)*	3.323 (0.068)	6.394 (0.041)
	D.lnGFC	D.lnEFI	All
D.lnGDP	6.698 (0.010)	1.787 (0.181)	9.017 (0.011)
	D.lnGFC	D.lnGDP	All
D.lnEFI	2.744 (0.098)	4.418 (0.036)	4.421 (0.110)

*Note: * p-value*

Source: Author

The stability of the model is explored using the tabular and graphical procedure. The tabular procedure suggests all eigenvalues to be lower than one. Thus, these models are considered stable. These results are confirmed using that graph that displays all eigenvalues to lie within unit circle. To conclude the empirical part, we present the forecast-error variance decomposition of trivariate model as well as the IRFs. Table 8 shows that approximately 98.6%, 1.1%, 0.3% of the variability of GFC is explained by GFC, GDP and EFI respectively. Moreover, 39.0%, 60.8%, 0.2% of the variability of GDP is explained by GFC, GDP and EFI respectively while 0.3%, 1.5%, 98.2% of the variability of EFI is explained by GFC, GDP and EFI respectively suggesting that all of the variables of interest are very complex and require the selection of determinants to be conducted with the great attention.

Table following on the next page

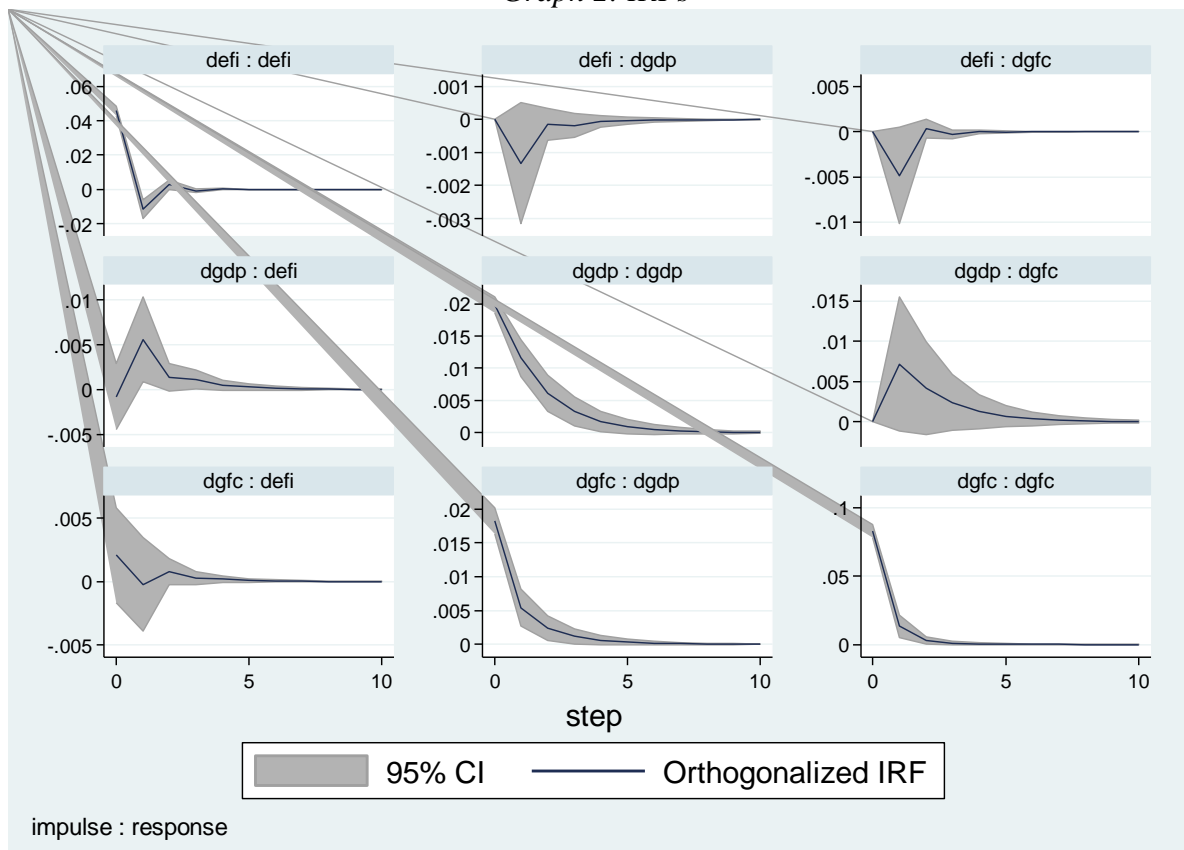
Table 8: FEVD

Response variable	Impulse variable			Response variable	Impulse variable			Response variable	Impulse variable		
D.lnGFC	D.lnGFC	D.lnGDP	D.lnEFI	D.lnGDP	D.lnGFC	D.lnGDP	D.lnEFI	D.lnEFI	D.lnGFC	D.lnGDP	D.lnEFI
0	0.000	0.000	0.000	0	0.000	0.000	0.000	0	0.000	0.000	0.000
1	1.000	0.000	0.000	1	0.460	0.540	0.000	1	0.002	0.000	0.998
2	0.989	0.007	0.003	2	0.408	0.590	0.002	2	0.002	0.014	0.984
3	0.987	0.010	0.003	3	0.395	0.603	0.002	3	0.002	0.015	0.983
4	0.986	0.010	0.003	4	0.391	0.607	0.002	4	0.002	0.015	0.982
5	0.986	0.011	0.003	5	0.390	0.608	0.002	5	0.002	0.015	0.982
6	0.986	0.011	0.003	6	0.390	0.608	0.002	6	0.002	0.015	0.982
7	0.986	0.011	0.003	7	0.390	0.608	0.002	7	0.002	0.015	0.982
8	0.986	0.011	0.003	8	0.390	0.608	0.002	8	0.002	0.015	0.982
9	0.986	0.011	0.003	9	0.390	0.608	0.002	9	0.002	0.015	0.982
10	0.986	0.011	0.003	10	0.390	0.608	0.002	10	0.002	0.015	0.982

Source: Author

Lastly, we plot and interpret IRF (Graph 1). The response of EFI to GDP is found to be negative only in the short-run reaching the positive value at the end of the period of interest. Similar conclusion can be drawn for the response of EFI to GFC. GDP is found to have a positive response to the EFI in both, short- and the long-term. However, this impact decreases over time. Similar conclusion can be drawn for the response of GDP to GFC. With regard of GFC it is found to positively respond to EFI but this response decreases over time. The similar conclusion can be drawn for the response of GFC to GDP. The impact in the short-run is much stronger than the impact in long-run.

Graph 2: IRFs



Source: Author

5. CONCLUSION

This paper explores the link between investment, economic freedom and economic growth. The annual panel data are collected for 35 OECD member states in the period between 1996 and 2015. The findings are presented for both, two-variables and three-variables models. The unit root test shows stationary properties at the first difference of the variables. Moreover, first-order panel is found to be appropriate. Bivariate models suggest a significant positive response of GFC to its lagged value as well as significant negative response of EFI to its lagged value. Moreover, a significant negative response of GDP to EFI is reported as well as significant negative response of GDP to GFC. The eigenvalues lower than one suggest that all of the models meet the stability properties. Granger causality tests provide the evidence on the bidirectional causal link between GDP and GFC. The findings of trivariate model suggest a significant negative response of GFC to EFI. Investment is however found to respond positively to the improvements in real GDP per capita. With regard to GDP it is found to respond negatively to the GFC as well as EFI. Lastly, economic freedom is found to respond negatively to GFC but positively to GDP. Granger causality test suggests a significant causal link running from GDP and EFI to GFC. The joint impact of these two variables is also found to be significant. Moreover, a significant causal link running from GFC to GDP is also found as well as the joint link of GFC and EFI with GDP. Lastly, GFC and GDP are found to Granger cause EFI. IRFs display the response of EFI to GDP to be negative only in the short-run reaching the positive value at the end of the period of interest. Similar conclusion can be drawn for the response of EFI to GFC. GDP is found to have a positive response to the EFI in both, short- and the long-term. However, this impact decreases over time. Similar conclusion can be drawn for the response of GDP to GFC. With regard of GFC it is found to positively respond to EFI but this response decreases over time. The similar conclusion can be drawn for the response of GFC to GDP. The impact in the short-run is much stronger than the impact in long-run. This paper suggests a necessity for policy makers to support the economic freedom since it has a great potential to contribute to the both, investments and finally the economic growth of the countries of interest. Thus, key dimensions of economic freedom including rule of law, government size, regulatory efficiency and open markets should be stimulated since these can significantly contribute to the key macroeconomic variables explored in this research. Papers to date did not explore quite extensively the link between investment, economic freedom and economic growth. Hence, this paper tends to fill in this gap in literature by providing empirical evidence on the matter. Moreover, OECD member states are in general developed, and to have enough capacity to promote the key dimensions of economic freedom what was the motivation to take these countries into consideration. Thus, these findings tend to provide an important insight for policy makers on the necessity to support the development of the key dimensions of economic freedom since it tends to contribute to investments as well as economic growth. The recommendations for future research suggest the need to take into account the trade openness of the variables since trade freedom is an important dimension of open markets. Moreover, it is of key importance to explore the potential impact of 2007-2008 financial crisis. At least, in addition to the joint impact of overall EFI index, there is a need to explore the relationship of interest by introducing the impact of every single component of EFI.

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APPENDIX

The list of the countries:

- Australia
- Austria
- Belgium
- Canada
- Chile
- Colombia
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Iceland
- Ireland
- Israel
- Italy
- Japan
- Korea, Rep.
- Luxembourg
- Mexico
- Netherlands
- New Zealand
- Norway
- Poland
- Portugal
- Slovak Republic
- Slovenia
- Spain
- Sweden
- Switzerland
- Turkey
- United Kingdom
- United States