THE ROLE OF GREECE, IRELAND, ITALY, AND SPAIN AS ECONOMIC COMPETITORS ACCORDING TO THE WEF INDEX

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Abstract
The purpose of this paper is to investigate the existence of positive or negative causality among variables that are part of the economic competitiveness methodology used by World Economic Forum (WEF) Index. The analysis is aimed at the data from Greece, Ireland, Italy, and Spain. Results from the VAR method show that, indeed, there is a significant level of causality, and therefore, the variables are rightly used for the construction of the WEF index.
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Index of acronyms:
FDI- Foreign Direct Investment
GCI - Global Competitiveness Index
H-O - Heckscher and Ohlin theory
IMD - International Institute for Management Development
WEF - World Economic Forum

1. Introduction

A positive relation among economic growth, competitiveness, and market openness (i.e. inward and outward FDIs) has been of major substantial theoretical and practical importance, especially in times of global systemic crises. In the pursuit of competitiveness, many have tried to suggest a widely used definition of the term. Obviously it is of great importance for countries worldwide to share a common opinion for the nature and characteristics of economic competition.

Some of the definitions that enjoy wide acceptance in the economic and business world are the following: (Garelli, 2003, p. 701): 'Competitiveness of nations looks how nations create and maintain an environment which sustains the competitiveness of its enterprises'. According to the OECD competitiveness is 'the degree, to which a nation can, under free trade and fair market conditions, produce goods and services which meet the test of international markets, while simultaneously maintaining and expanding the real incomes of its people over the long-term'[1]. According to Porter (2003) the competitiveness of nations (as he puts it in his *diamond theory*) 'is a complex outcome of the forces described as factor conditions, context and rivalry conditions, demand conditions, and supporting industries-cluster conditions'. Many critiques have been addressed to Porter's *diamond theory*, as he makes a comparison between countries's and companies' characteristics, treating them as identical.

The case of competitiveness for countries like Greece, Ireland, Italy, and Spain has become more and more concerning, due to their high government debt levels and the attacks they accept for being responsible for the weakness of the Euro zone. Not only government officials, but also companies are much more interested

[1] Competitiveness: Helping Business to Win, 1994, Cm.: 2563, p. 9.

in identifying what the cause(s) of the countries' diminishing competitiveness level is (are). The purpose of this research is to test specific variables that the WEF uses in order to construct the Global Competitiveness Index (GCI). The novelty lies in the variables selected, variables that correspond to a widely accepted index, in order to see whether they are rightfully chosen in the first place. Although there exist several other indices for the same reason, the WEF index is the most widely used today. More specifically, we set the hypothesis that, since the WEF uses specific variables, there should be some kind of causality among them. Our way of testing this hypothesis is to apply the VAR method and run granger causality tests for confirmation. The rest of the paper is structured as follows: after the analysis of the current and past literature review (section 2), section 3 describes the data and methodology the research uses. After that, section 4 displays the analysis' results and attempts to discuss them, while several suggestions for further research are made. Finally, an appendix displays all the results of the analysis and the descriptive statistics of the sample.

2. Current and past arguments on competitiveness issues and trade theories

The analysis of Smit A. J. (2010) provides descriptions of trade theories from Adam Smith till today. He focuses on the disadvantage of Porter's Diamond framework in that it is management-based (and not economic-based). He poses the question whether competitiveness is a positive-sum, a zero-sum, or a negative-sum game. In his analysis of Porter's Diamond framework he comments on the fact that the latter uses more logical reasoning than needed instead of mathematics, but even in this way Porter cannot reject or outreach comparative advantage theory. Finally, he concludes by stating that countries do not behave like firms in competition, and that comparative advantage is a result of country differences and explains inter-industry trade. Apart from that he notes that in order to differentiate between country-and-firm specific sources of competitive advantage, a distinction has to be drawn between internal and external strategic factor markets.

Krugman P. (1994) argues that competitiveness among countries is not the same as competitiveness among firms. Therefore, a country's economic success is not dependent on its success in the global market, since profit is not an issue here. Instead of using a two-dimensional approach as more theories do, one should use multiple dimensions with dynamic factors that continuously change. Finally, he refers to examples to justify that the major nations of the world are not to any significant degree in economic competition with each other, focusing mainly on the USA, Japan, and other similar countries.

In line with Krugman's point of view lies Porter's arguments (2003), who notes that the key for understanding the competitiveness of nations is the source of national prosperity, that is, the economy's productivity measured by the value of its goods and services per unit of the economy's human capital and natural resources.

Lall S. (2001) makes an attempt to question whether the WEF Index methodology hides any deficiencies. She argues that in order to contact a thorough competitive analysis for a country in any case, one must carefully select their variables from different sub-categories of the economy in question, the research framework should be as accurate as possible, the methodology should be realistic and there researcher should have understood the country's government objectives. More specifically, 'Our examination of the WEF index shows that several

analytical, methodological, and quantitative weaknesses reduce its reliability as a tool for analysis….The index suffers from two faults. The first is its underlying assumption that most markets are efficient and policies must be 'market friendly'. This removes from the analysis a large and important set of issues, particularly in developing countries, where market failures call for selective and strategic responses. Second, it defines 'competitiveness' in a general way (per capita incomes) that take it away from the analysis of direct competition between countries and into the sphere of growth and productivity analysis' (2001, pp.33). The point where Lall converges with P. Krugman's opinion is in her notice that the WEF Index (as well as the IMD Index) consider the markets to be efficient. Therefore, according to the hypotheses they adopt, there cannot be a market failure, since equilibrium can be achieved without any government intervention, something that is being falsified by recent facts.

Competitiveness according to D. Ricardo and how the theory fits today

D. Ricardo's comparative advantage explains why trade is a positive-sum game (something that P. Krugman also accepts). Its drawback is that it does not explain the *direction* of trade. Therefore, the theory of Heckscher and Ohlin appeared that was tested by Wassily Leontief in 1954. Several other economists, in order to explain the H-O theory, have invoked the differences in human capital, the product cycle theory, and the technological gap theory.

Previous trade theories had assumed that perfect competition and constant returns to scale always apply. At the end of the 1970's there evolved new theories based on monopolistic competition. What these theories could not explain, though, was the actual location of production in the H-O theory. The most important assumption of the new theories is that free trade can result in a positive-sum game. Nevertheless, although traditional and new trade theories fully explain the sectoral composition of trade, they fail to explain the country-specific advantages that determine the international competitiveness of firms.

The new condition of the oligopolistic market structure led to the belief that countries, like global firms, antagonize each other for a share of the world market and that governments play a substantial role at this goal. In the end, there is no theory that describes in the best way the global economic reality. If international markets are imperfectly competitive then trade is affected by economies of scale, but this is not fully acceptable due to these assumptions' instability. We can safely say that trade theories of monopolistic and oligopolistic competitions do not explain the actual location of production, unlike D. Ricardo's theory of comparative advantage.

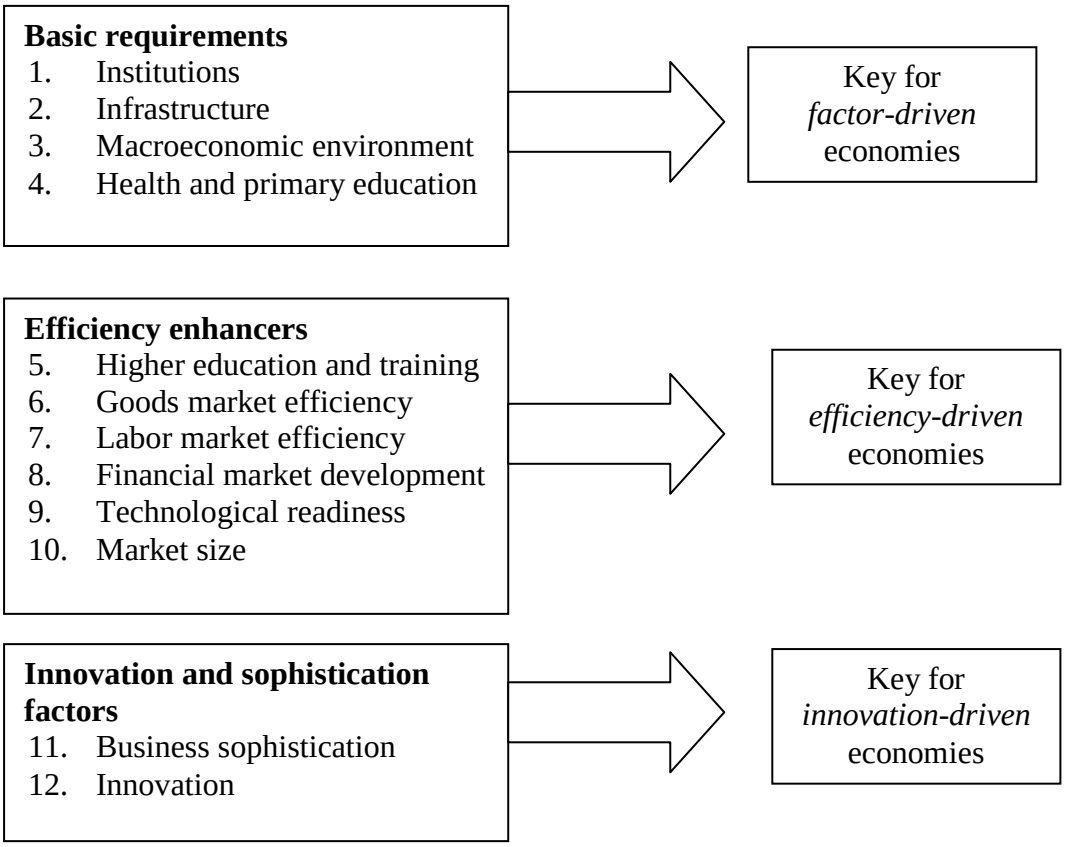
Porter's Diamond framework does not concern trade among countries, but is rather a more general analysis of country-specific sources of advantage that enhance the international competitive advantage of firms. Overall, Porter's theory does not offer something new. It cannot be used as a tool for trade policy. A positive result is that this theory unifies other theories of sources of country-competitive advantage, resource-based view of firms, and competitive advantage of firms. Therefore, only these kinds of cases are fit to use Porter's theory, and not in the case of national competitiveness.

Today there are several competitiveness indices by several institutes, each one being the result of different methodologies, but the most reliable ones are: 1) The WEF (World Economic Forum) Global Competitiveness Report, 2) The IMD's

(International Institute for Management Development) World Competitiveness Yearbook, and 3) The Centre for International Competitiveness, which issues the *World Knowledge Competitiveness Index* and the *European Competitiveness Index*.

The computation of the WEF's GCI (Global Competitiveness Index) is based on successive aggregations of scores from the indicator level (i.e., the most disaggregated level) all the way up to the overall GCI score. The WEF method uses an arithmetic mean to aggregate individual variables within a category. For the higher aggregation levels, they use the percentage that is shown (in the report) next to each category. This percentage represents the category's weight within its immediate parent category. Reported percentages are rounded to the nearest integer, but exact figures are used in the calculation of the GCI. For example, the score a country achieves in the 9th pillar accounts for 17 percent of this country's score in the efficiency enhancer's sub-index, irrespective of the country's stage of development. Similarly, the score achieved on the sub-pillar transport infrastructure accounts for 50 percent of the score of the infrastructure pillar.

The twelve pillars of competitiveness are:
Figure 2.a: The WEF pillars of variables



(source: WEF Global Competitiveness Report 2010-2011)

The following table 2.b shows the ranking positions of Greece, Ireland, Italy, and Spain, with 1 being the highest rank and 139 the lowest. As a notice, the USA rank 4th and the UK 12th in the same GCI for the period 2010-2011. It is clear that the index shows a steady decrease in competitiveness for the four countries' ranking positions, with Greece holding the lowest rank among them.

Table 2.b: Global Competitiveness Index 2010-2011, rank (out of 139)

	Greece	Ireland	Italy	Spain
GCI 2010–2011	**83**	**29**	**48**	**42**
GCI 2009–2010 (out of 133)	71	25	48	33
GCI 2008–2009 (out of 134)	67	22	49	29
Basic requirements	**67**	**35**	**46**	**38**
1st pillar: Institutions	84	24	92	53
2nd pillar: Infrastructure	42	38	31	14
3rd pillar: Macroeconomic environment	123	95	76	66
4th pillar: Health and primary education	40	10	26	49
Efficiency enhancers	**59**	**25**	**45**	**32**
5th pillar: Higher education and training	42	23	47	31
6th pillar: Goods market efficiency	94	14	68	62
7th pillar: Labor market efficiency	125	20	118	115
8th pillar: Financial market development	93	98	101	56
9th pillar: Technological readiness	46	21	43	30
10th pillar: Market size	39	54	9	13
Innovation and sophistication factors	**73**	**21**	**32**	**41**
11th pillar: Business sophistication	74	20	23	35
12th pillar: Innovation	79	22	50	46

3. Data and Methodology

Data

Our data consists of eight variables that the WEF method uses in order to construct the competitiveness index. These variables correspond to four of the twelve pillars of the WEF method described above. Namely, these are:

Gross National Income (GNI) per capita in USD (PPP), pillar……..3
Real GDP annual growth rate (%)……pillar……..3
Government deficit/surplus as % of GDP……pillar……..3
General government debt as % of GDP……pillar…….3
Public expenditure on health as % of GDP……..pillar……..4
Inflow of FDI as % of GDP…….pillar……..6
Outflow of FDI as % of GDP…….…pillar……..6
Unemployment rate (total civilian labor force)……..pillar……...7

For homogeneity reasons we have valued all of the variables in terms of GDP, except the unemployment rate variable. All of the variables are believed to have a significant effect to a country's competitiveness level. GNI p.c. provides the individuals' ability to participate in effective demand of domestic and foreign goods and services. Real GDP annual growth rate is a widely used indicator of economic development. Government deficit/surplus and general government debt as % of GDP provides a look at the government's financial management; high surpluses are considered as antagonistic, while deficits are thought of as weakness. Nevertheless, continuous government deficits are being add up to long run government debts, so there should be a level of interdependency between them. For the 'public expenditure on health' variable, its use in the 4th pillar of the WEF index is justified

as follows: 'A healthy workforce is vital to a country's competitiveness and productivity. Workers who are ill cannot function to their potential and will be less productive. Poor health leads to significant costs to business, as sick workers are often absent or operate at lower levels of efficiency. Investment in the provision of health services is thus critical for clear economic, as well as moral, considerations' (WEF Global Competitiveness Report 2010, Chapter 1.1, pp.5). Inflow and outflow of FDI's are being used in order to assess the level of government intervention on free trade. The WEF methodology treats high values of IFDI and OFDI as signs of minimum restrictive and discriminatory rules on trade, while low values are thought of as signs with high intervention, for example distortionary or burdensome taxes, restrictive or discriminatory rules on international trade, and so on. The unemployment rate is being chosen bearing in mind that 'the efficiency and flexibility of the labor market are critical for ensuring that workers are allocated to their most efficient use in the economy and provided with incentives to give their best effort in their jobs. Labor markets must therefore have the flexibility to shift workers from one economic activity to another rapidly and at low cost, and to allow for wage fluctuations without much social disruption. The importance of the latter has been dramatically highlighted by the difficulties countries with particularly rigid labor markets—such as Spain—have encountered in recovering from the recent major economic downturn' (WEF Global Competitiveness Report 2010, Chapter 1.1, pp.7).

Methodology

In general, the assumption that some of the predetermined variables are only present in some of the equations of a model is a subjective one. This has been criticized by Sims C. (1980), according to who if there is true simultaneity among a set of variables, they should be treated on an equal footing (i.e. there should not be any distinction between endogenous and exogenous variables). In this spirit Sims developed the VAR model, as it is briefly exposed later.

First we gather our data in a pooled time series object. The VAR method cannot be adopted at this stage due the few data of each country (nine observations). Our next step is to check for any signs of non-stationarity by using the Augmented Dickey-Fuller (ADF) test. The test's results are available in the Appendix and they show that only in six cases we had to use first differences. After that, we formulate our data of each country form a pool time-series to a panel, frequently dated from 2001 to 2008. The panel therefore consists of eight variables from the WEF Index method that correspond to the four countries, Greece, Ireland, Italy, and Spain. Our next step is to use the Vector Auto-Regression (VAR) method in order to treat our variables as *endogenous*. Furthermore, we are willing to investigate whether there is any kind of granger-causality among our variables. More specifically, one of the implications of this theorem is that if any two variables, X_t and Y_t, are cointegrated and each one is individually integrated of order 1 (each is individually non-stationary), then either Xt must granger-cause Yt or the opposite. Not only do we care about any signs of granger-causality, but also about its direction of causality.

To briefly explain the method the VAR model works, in the case of a two-variable model with X_t and Y_t, vector auto-regression is a set of two equations, each of which contains κ lag values of of X_t and Y_t:

$$X_t = \alpha + \sum_{j=1}^{k} \beta_j X_{t-j} + \sum_{j=1}^{k} \gamma_{t-j} Y_{t-j} + u_t$$

and

$$Y_t = \alpha' + \sum_{j=1}^{k} \beta_j Y_{t-j} + \sum_{j=1}^{k} \gamma_{t-j} X_{t-j} + u_t$$

where, X_t and Y_t are column vectors of observations at time t on the two variables, and u_t is the stochastic error term (or *innovation* or *shock* in the language of VAR).

We set the hypothesis that, according to the ratings of the WEF Index, the five countries are rightfully placed in their rank. Therefore, since the variables are used to construct the final WEF competitiveness index, there should be significant level of effectiveness among them. To test this we will use our randomly selected variables that correspond to the twelve pillars and reflect the characteristics used to provide the Global Competitiveness Index (GCI) of the WEF.

Our final equations consist of eight variables-one equation for each variable. We chose the variables that can be easily quantified and that respond to the macroeconomic aspect of the economies, since the WEF methodology uses many qualitative data. Every variable in itself contains data from all of the four countries we are examining.

$$GNI_t = \alpha + \beta_1 GNI_{t-1} + \beta_2 GDPG_{t-1} + \beta_3 GDEF_{t-1} + \beta_4 GD_{t-1} + \beta_5 PEH_{t-1} + \beta_6 IFDI_{t-1} + \\ + \beta_7 OFDI_{t-1} + \beta_8 UR_{t-1}$$

$$GDPG_t = \alpha + \beta_1 GNI_{t-1} + \beta_2 GDPG_{t-1} + \beta_3 GDEF_{t-1} + \beta_4 GD_{t-1} + \beta_5 PEH_{t-1} + \beta_6 IFDI_{t-1} + \\ + \beta_7 OFDI_{t-1} + \beta_8 UR_{t-1}$$

$$GDEF_t = \alpha + \beta_1 GNI_{t-1} + \beta_2 GDPG_{t-1} + \beta_3 GDEF_{t-1} + \beta_4 GD_{t-1} + \beta_5 PEH_{t-1} + \beta_6 IFDI_{t-1} + \\ + \beta_7 OFDI_{t-1} + \beta_8 UR_{t-1}$$

$$GD_t = \alpha + \beta_1 GNI_{t-1} + \beta_2 GDPG_{t-1} + \beta_3 GDEF_{t-1} + \beta_4 GD_{t-1} + \beta_5 PEH_{t-1} + \beta_6 IFDI_{t-1} + \\ + \beta_7 OFDI_{t-1} + \beta_8 UR_{t-1}$$

$$PEH_t = \alpha + \beta_1 GNI_{t-1} + \beta_2 GDPG_{t-1} + \beta_3 GDEF_{t-1} + \beta_4 GD_{t-1} + \beta_5 PEH_{t-1} + \beta_6 IFDI_{t-1} + \\ + \beta_7 OFDI_{t-1} + \beta_8 UR_{t-1}$$

$$IFDI_t = \alpha + \beta_1 GNI_{t-1} + \beta_2 GDPG_{t-1} + \beta_3 GDEF_{t-1} + \beta_4 GD_{t-1} + \beta_5 PEH_{t-1} + \beta_6 IFDI_{t-1} + \\ + \beta_7 OFDI_{t-1} + \beta_8 UR_{t-1}$$

$$OFDI_t = \alpha + \beta_1 GNI_{t-1} + \beta_2 GDPG_{t-1} + \beta_3 GDEF_{t-1} + \beta_4 GD_{t-1} + \beta_5 PEH_{t-1} + \beta_6 IFDI_{t-1} + \\ + \beta_7 OFDI_{t-1} + \beta_8 UR_{t-1}$$

$$UR_t = \alpha + \beta_1 GNI_{t-1} + \beta_2 GDPG_{t-1} + \beta_3 GDEF_{t-1} + \beta_4 GD_{t-1} + \beta_5 PEH_{t-1} + \beta_6 IFDI_{t-1} + \\ + \beta_7 OFDI_{t-1} + \beta_8 UR_{t-1}$$

where GNI is the gross national income variable,
GDPG is the rate the GDP grows in %,
GDEF is the government's deficit/surplus as a % of GDP,
GD is the government's debt as a % of GDP,
PEH is the public expenditure on health as % of GDP,
IFDI is the inflow of FDI as % of GDP,
OFDI is the outflow of FDI as % of GDP, and
UR is the unemployment rate in total civilian labor force.

4. Results and discussion

Table 4.1 in the Appendix shows the relationships among the eight variables. In the first equation of GNI as a dependent variable, we notice that the current level of GNI per capita is mainly positively affected by the GDP growth (coefficient: 226.757) and public expenditure on health (coefficient: 882.502) in lagged terms. Unemployment rate has, as expected, a negative effect of - 72.975. Therefore, it seems that a healthier labor force can more efficiently contribute the country's growth of production (i.e. GDP), and increase its income as well, as stated in the WEF report. In the GDP growth rate equation the findings' statistical significance is poor, so we cannot ensure our opinion on the variables' relationships. The same accounts for the government deficit/surplus[2] and the government debt[3] equations.

In the PEH equation, our results show statistical significance for the PEH_{t-1} and $IFDI_{t-1}$ at 2% level, and for the $GDPG_{t-1}$ at 1% level. PEH variable is obviously affected by its lagged term, but also by inward FDI levels. On the other hand, an increase in GDP growth rates seems to negatively affect the level of government expenditure on health. In the IFDI equation, the only statistically significant finding is that of IFD_{t-1} at 10% level. Lagged levels of government debt seem to statistically affect outward FDIs[4] in our next equation, while the other variables lack statistical significance. Finally, in our unemployment rate equation, the only statistically significant finding is that of UR_{t-1} at 0.2% level (coefficient: 0.852), implying that unemployment is solely affected by itself in lagged terms. A crucial notice here is that, although *statistical* significance is important, *economic* significance can be of greater importance in several cases. For example, in our GDPG equation, the lack of statistical significance cannot silence the fact that GDP growth rate is positively affected by its lagged term and negatively affected by unemployment rate. If we are to consider GDP growth rate as a special competitiveness factor for the four countries in question, then government officials should pay attention to the remedy measures they apply to decrease their public deficit. By increasing taxation and cutting on government expenditure, countries with enhanced public sectors, like Greece, Spain and Italy, face the danger of increased unemployment in the public sector and decreased levels of consumption and savings in the private sector.

[2] In the government deficit/surplus function only the value of lagged government debt is significant at 1% level, which validates the negative relationship (coefficient: -0.079) between the two.
[3] In the government debt equation the only statistically significant finding is that of lagged government debt, which shows a clear time memory of the variable (coefficient: 1.006).
[4] Significant at 10%, coefficient: -0.098.

Granger causality results

We assume that changes in a variable, say X_t, should precede changes in another variable, say Y_t. Therefore, in our VAR model of Y_t against the rest of the variables we should test whether past (lagged) values of one variable affect current (level) values of the other variables. The steps of the granger causality test are:

- Regress the current value of the dependent variable against the lagged values of the rest of the variables.
- Run the regression including the lagged terms (unrestricted regression).
- The H_0 is that the lagged terms do not belong into the regression, i.e. there is no granger causality among the variables.
- In order to test this hypothesis, we apply the F test as follows:

$F = \dfrac{\left(RSS_R - RSS_{UR}\right) / m}{RSS_{UR}\left(n-k\right)}$, where RSS_R is the residual sum of squares of the *restricted* equation, and RSS_{UR} is the residual sum of squares of the *unrestricted* equation, m is the number of lagged terms and k is the number of parameters estimated in the *unrestricted* equation.

- If the computed F value exceeds the critical F value at the chosen level of significance, we can reject the null hypothesis; in another way we can safely say that there exists granger causality.

The following table 4.2 shows the results of the pairwise granger tests. For space economy we provide only the statistically significant findings which denote the presence of granger causality. The rest of the results (that do not show any signs of causality) are available on request. As an example, in the first case of our table we cannot reject the H_0 that GDEF does not granger causes GD (and vice versa), so we can safely say that there exists a two-way granger causality between the two variables.

Table 4.2: Pairwise granger causality tests

Null Hypothesis:	Obs	F-Statistic	Probability
GDEF does not Granger Cause GD*	24	7.02716	0.00519
GD does not Granger Cause GDEF**	24	4.50863	0.02498
GNI does not Granger Cause GD**	24	4.08290	0.03349
IFDI does not Granger Cause GD****	24	2.41474	0.11630
OFDI does not Granger Cause GD****	24	1.93924	0.17124
GD does not Granger Cause OFDI****	24	1.99548	0.16344
GD does not Granger Cause UR****	24	1.71437	0.20678
GDEF does not Granger Cause GDPG**	24	4.35136	0.02781
GDEF does not Granger Cause GNI**	24	4.02792	0.03481

IFDI does not Granger Cause GDEF****	24	1.70285	0.20881
GDEF does not Granger Cause OFDI**	24	3.83580	0.03987
GNI does not Granger Cause GDPG**	24	3.88674	0.03846
IFDI does not Granger Cause GDPG***	24	3.53641	0.04947
GDPG does not Granger Cause PEH**	24	3.84182	0.04496
IFDI does not Granger Cause GNI***	24	2.67067	0.09504
UR does not Granger Cause GNI**	24	3.85479	0.03934
IFDI does not Granger Cause PEH**	24	3.68291	0.04998
UR does not Granger Cause PEH***	20	3.46754	0.05783

*denotes significance at 1% level
** denotes significance at 5% level
*** denotes significance at 10% level

Obviously there exists a two-way granger causality between government debt and government deficit. Interestingly enough, government debt is also granger caused by lagged values of GNI and inward FDIs. If GNI is mostly used in consumption rather than in investment or savings, it is logical that in order to continue spending (consuming), Greece, Ireland, Italy and Spain will need foreign funding. This is the major reason for the ever-growing public debt levels, especially in Greece. Apart from the fact that government deficit is the major effective variable of public debt, the level of consumption behavior nationally, measured by the marginal propensity to consume, crucially affects the level of foreign loans a country needs to cover its current expenses.

Another substantial two-way granger effect is found between government debt and outward FDIs. It is a common fact in all of our sample's countries, where increased levels of government debt lead domestic companies to expand abroad. Therefore, there is a severe outflow of capital towards neighboring countries, especially in the cases of Greece and Italy, which otherwise could be utilized for the sake of the domestic economies. Therefore, an increase of the government deficit acts as a stimulus for increasing outward FDIs.

Our overall results show that there exists several level of causality in some of the most important macroeconomic variables that the WEF selects to construct the WEF competitiveness index. Therefore, it is safe to say that they are correctly used for that purpose. Further analysis of the WEF index could involve the use of different variables (i.e. both qualitative and quantitative ones), different pillar selection, countries of different regions, for example a data sample consisting of the USA, Japan and Germany, and perhaps the use of different methodologies. By examining different aspects of competitiveness in this way it is a secure method to either validate or argue the WEF index method, and perhaps propose an alternative.

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Appendix

Table 4.1: VAR estimates

Vector Autoregression Estimates
t-statistics in [ ]

	GNI	GDPG	GDEF	GD	PEH	IFDI	OFDI	UR
GNI(-1)	0.913816	-0.000146	-3.79E-05	5.77E-05	9.65E-05	0.000838	0.000304	-6.82E-05
	[12.9630]	[-0.77523]	[-0.24543]	[0.14565]	[4.11002]	[0.77960]	[1.39249]	[-0.99253]
GDPG(-1)	226.7578	0.391298	-0.280224	0.122209	-0.105903	1.091609	0.307912	0.063488
	[2.07556]	[1.33949]	[-1.17024]	[0.19893]	[-2.91168]	[0.65505]	[0.91077]	[0.59643]
GDEF(-1)	-48.12618	-0.069615	0.078581	-0.292534	-0.031481	3.150938	0.137147	0.172861
	[-0.38376]	[-0.20761]	[0.28589]	[-0.41485]	[-0.75405]	[1.64725]	[0.35341]	[1.41475]
GD(-1)	-17.77486	-0.021281	-0.079960	1.006328	-0.001151	0.231803	-0.098828	0.013610
	[-1.42983]	[-0.64022]	[-2.93460]	[14.3961]	[-0.27809]	[1.22246]	[-2.56901]	[1.12362]
PEH(-1)	882.5028	-0.454208	1.524366	-0.285520	0.384612	-7.655810	2.139148	-0.488522
	[2.06405]	[-0.39730]	[1.62664]	[-0.11876]	[2.70202]	[-1.17390]	[1.61679]	[-1.17270]
IFDI(-1)	-27.83398	-0.062327	-0.028353	0.030313	0.016686	0.529529	-0.035929	-0.001145
	[-1.52573]	[-1.27773]	[-0.70908]	[0.29550]	[2.74741]	[1.90297]	[-0.63644]	[-0.06441]
OFDI(-1)	-24.61662	-0.026858	0.034193	0.087512	-0.026451	-1.102922	-0.576154	0.007373
	[-0.32883]	[-0.13418]	[0.20839]	[0.20789]	[-1.06134]	[-0.96589]	[-2.48710]	[0.10109]
UR(-1)	-72.97558	-0.276613	0.072444	-0.189364	0.033988	-0.236155	-0.189073	0.852998
	[-0.88118]	[-1.24916]	[0.39911]	[-0.40664]	[1.23276]	[-0.18695]	[-0.73778]	[10.5714]
C	-210.3990	12.71197	-2.549065	-2.270567	1.299214	12.25604	-5.406384	4.524645
	[-0.07314]	[1.65260]	[-0.40427]	[-0.14037]	[1.35656]	[0.27931]	[-0.60731]	[1.61428]
R-squared	0.990194	0.674299	0.908676	0.996580	0.928531	0.415803	0.894668	0.972292
Adj. R-squared	0.984964	0.500592	0.859970	0.994756	0.890414	0.104231	0.838491	0.957514
S.E. equation	490.5747	1.311735	1.075244	2.758522	0.163321	7.482866	1.518086	0.477977
F-statistic	189.3340	3.881818	18.65629	546.4196	24.36011	1.334533	15.92591	65.79410

Table 5: Descriptive statistics

	GD	GDEF	GDPG	GNI	IFDI	OFDI	PEH	UR
Mean	78.920	-1.668	3.576	27327.96	2.439	3.988	5.825000	7.982
Median	82.903	-1.070	3.631	26966.83	1.518	3.029	5.800000	8.500
Maximum	120.177	3.000	6.477	37996.59	22.620	12.196	6.900000	11.100
Minimum	28.319	-7.399	-0.016	20057.56	-19.738	0.164	5.100000	3.900
Std. Dev.	37.821	2.771	1.799	4118.434	7.395	3.607	0.508174	2.396
Skewness	-0.109	-0.156	-0.261	0.673576	0.149	0.840	0.498255	-0.444
Kurtosis	1.184	1.944	2.223	3.407308	6.294	2.444	2.495673	1.808
Jarque-Bera	3.900	1.414	1.023	2.310836	12.769	3.655	1.455273	2.577
Probability	0.142	0.492	0.599	0.314926	0.001	0.160	0.483049	0.275
Sum	2209.780	-46.720	100.148	765182.9	68.304	111.682	163.1000	223.500
Sum Sq. Dev.	38622.11	207.437	87.467	4.58E+08	1476.805	351.302	6.972500	155.021
Observations	28	28	28	28	28	28	28	28

Table 6: Summarized results of stationary test: ADF tests

	Without constant		**With constant**		**With linear trend and a constant**
Variable	Level	1st difference	Level	1st difference	Level
GNI per capita	GR:3.57*** GER:6.43*** IRE:1.85* IT:2.19** SP:4.05***				
Real GDP growth	GER:-1.01* IRE:-1.09* IT:-1.86* SP:-1.05*				GR:-22.69***
Government deficit	GER:-1.53* IRE:-1.95* SP:-3.67***		GR:-5.17*** IT:-2.90*		
Government debt	GR: -1.82* GER: 4.62*** SP:-1.88*			IRE:-2.67*	IT:-10.59***
Public exp. on health	IT:1.15* SP:1.87*	GR:-2.47** IRE:-1.70*			GER:-5.47**
Inflows of FDI	IRE:-3.64***	SP:-2.74**	GER:-2.93* IT:-2.52*		GR:-3.90*
Outflows of FDI	IT:1.09*	SP:-2.77**	GR:-3.56* GER:-3.43*		IRE:-3.92*
Unempl. rate	GER:-1.03* IRE:1.36* IT:-1.85*	GR:-1.59*	SP:-3.04*		

* significant at 10%
**significant at 5%
*** significant at 1%