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Truth Behind Economic Performance, Natural Resources and Attracting Foreign Direct Investment

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Using a preliminary investigation and analysis on the latest data on GDP (Gross Domestic Product) performance, GOI (Global Opportunity Index), Vulnerability Score, Readiness Score, and the number of resources of economic importance, exploratory or preliminary SEM (structural equation modelling) was prompted on the recent available data of the 131 countries (n=131). The model was robust, addressing concerns about multivariate assumptions and other measures on the goodness of fit. It was found that the number of natural resources of economic importance plays a large role in the GDP performance. Thus, the preliminary symptom of Dutch disease continues to manifest for as long as each country aims for development, with their resources as ultimate enticing factors for foreign direct investment (FDI). In addition, economic growth is so far observed to be associated with the vulnerability of the country to climate change. Finally, economic growth was found to be linked to the negative impacts argued by the dependency theory. Implication on governance was discussed.

Keywords*: GDP, FDI, vulnerability measure, readiness measure, resources*

JEL Classification*: O10, O20*

1. Introduction

Growth is common or a critical measure of performance of a nation. Economic performance is one area of the growth of the country that most development administrators and economists take into account. From the past to the present, economies linked their aggregate production, consumption, investment and net export of goods and services to how well they perform. Gross domestic product (GDP) is a primary indicator to measure the health of the economy of a country.

More investments for the country bring in irrefutable opportunities. For as long as human capital favors the contribution of foreign direct investment (FDI) to employment, the belief in the economic importance of skill production for foreign affiliates remains (Jude and Silaghi, 2016). Real employment ratio increases real

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GDP in the short run (Ozturk and Acaravci, 2010), as far as human capital could associate itself with regional economic growth (Fleisher, Li and Zhao, 2008). From the standpoint of neoclassical economics, China through inward FDI achieved economic gains in the form of capital formation, export expansion, technology transfer, and transformation of the economic structures and institutions (Lo, Hong and Li, 2016). Looking at it through the lens of neoclassical economics, it makes sense why nations, particularly the developing ones, should attract FDI. It was found that FDI has a greater impact on the welfare of poor countries than the wealthier ones in Africa (Gohou and Soumare, 2012). In Southeast Asia, those with competitive advantages are said to continue to attract investors due to observed pluses of FDI (Diaconu, 2014).

Nevertheless, there are some noted drawbacks in attracting FDI. First, reducing employment protection rules increases FDI, which is a common theme of critique of globalization (Olney, 2013). Although such might not be the general scenario for all, for example in the European case, investment is not affected by stringent employment protection laws, but rather by the level of access to financial markets (Calcagnini, Ferrando and Giombini, 2014). Next, investment at some point may require loss of some natural resources that for instance, are of high value to the rural poor population that could only be counterweighed by gaining employment and opportunities (Baumgartner, Braun, Abebaw, and Muller, 2015). In addition, as far as the environmental issue is concerned, a study asserts that a foreign involvement in ownership in China can haggle with environmental levies associated with pollution control, which gives birth to concession just to attract FDI primarily in developing provinces (Chen, Maung, Shi and Wilson, 2014).

On the other hand, natural resources simply boast economic growth. As noted, since 2002, mineral-rich regions in Russia are richer than other regions (Alexeev and Chernyavskiy, 2015). In Norwegian economy, about 20 percent of the annual GDP per capita increase is associated with endowment of petroleum resources such as oil, natural gas, natural gas liquids, and condensate (Mideksa, 2013). In addition, investing resource revenues in public capital may promote economic growth (Melina, Yang and Zanna, 2016).

However, economic development has substantial drawback when economies forget to produce back-up industries as other industries flourish due to the discovery of natural resources that are of high economic importance. Such is found in the case of the Dutch disease, coined by the *The Economist* in 1977 (Ebrahim-zadeh, 2003; The Economist, 1977). Therefore, managing income from the expected natural resource revenue eliminates the possibility of Dutch disease explained in literature. The productivity and supply responses of spending could be the roots to ensure the realization of the benefits linked to mineral revenue (Go, Robinson and Thierfelder, 2016). Furthermore, countries with greater economic freedom may not be that vulnerable to the negative growth effects of resource rents (Farhadi, Islam and Moslehi, 2015).

The UN Millennium Project (2006) asserts that investing in development is key to a nation's success which makes millennium development (MDG) goals matter. The project simply sees MDGs as the fulcrum of international development policy, that help advance the means to a productive life, and they are critical for global security. The bottom line of this is development. The UN Millennium Project reported that there are four reasons for shortfalls in achieving the goals and could be summarized as governance failures, poverty traps, pockets of poverty and areas of specific policy neglect.

While measuring the growth of the economy is still substantial through the lens of neo-classical growth theory, there are other important things that can be considered in understanding the country's economic growth as implied in the report of the UN Millennium Project. The efficiency of labor, for instance, allows the economy to ignite economic growth for as long as a faster labor-force growth exists. In context, if the government does what it needs to do, investment will pour in, giving everyone a good opportunity to employment, and eventually economic growth, as implied into the GDP. By citing the point of the UN Millennium Project, it is clear that governance issue plays a significant role in making natural resources and attracting foreign direct investment productive, at some point. A good governance allows the achievement of MDGs to their full level, especially in the midst of acquiring sustainability and innovation to national development in the new era, by which the environment, the source of raw materials for development, is at stake. This requires that the economy of the country should be linked to other economies, creating a significant justification of the dependency theory (Ahiakpor, 1985; Ferraro, 2008).

For this paper, to address the combined theoretical foundation of dependency theory and the one stated by the UN Millennium Project about governance failure, it is of importance to measure how these natural resources and the country's ability to attract foreign investment (GOI) affect the GDP performance. Much to understanding this relationship is the interest of conducting an initial exploration of the mediation effect of vulnerability score and readiness score. These are specific measures of level of governance potential of a country, but not specifically addressed in the literature yet as far as their linkage to economic performance is concerned. On the other hand, GOI itself could mark as potential measure of governance level, but it will be

brought to a higher stage if mediated by other factors in line with governance, is a particular point of view that this paper investigates. Furthermore, even if the number of natural resources could truly improve a country's investment potential, thus its GDP's performance, government intervention through its level of governance is still a remarkable issue, so as to eliminate the preliminary economic symptom of Dutch disease.

2. Research Methodology

2.1 Data and Sample Size

The study is an initial exploration of testing the associated relationship of variables in the preliminary discussion. Thus, the latest available data for GOI, number of natural resources of economic value per country, readiness score, vulnerability score and GDP in 2016 were gathered for data analysis and exploration purposes.

There were data sets coming from 131 countries, of which at least 80 percent of these nations are developing countries. In the following sections, information of the data sets and variables of the study is presented.

ND-Gain Index Organization (2016) measures every country's vulnerability score and readiness score, which are all specific measures of government's level of performance in governing the negative impact of climate change and ability to leverage investments and convert them to adaptation actions.

Milken Institute (2016), on the other hand, reveals the Global Opportunity Index (GOI) for each country, which measures economic fundamental factors, ease of doing business, quality of regulations and rule of law. Singapore was on top in 2015. The GOI simply measures the ability of a country to attract foreign investments, which clearly is a primary task of the government, prior to economic growth.

Central Intelligence Agency (2016) has a list of every nation's primary natural resources with substantial value to the economy. Furthermore, the organization published the latest data for GDP (PPP, OER, Per Capita) of each country.

2.2 Internal Validity

To ensure that the study measures what it actually wants to measure, everything placed in the model has a corresponding connection to the established theory or proposed theory. For this paper, the fundamental point of view relies on the dependency theory and the UN Millennium Project, with particular reference as to how or why economies fail to achieve their goals. One fundamental concern is failure governance. Each variable in the model, at some point, measures or has link to matters concerning governance.

Furthermore, multivariate assumptions and analysis for the data were preliminary considered and addressed prior to data analysis, to ensure that the model measures the existing reality concerning growth and development of the nation. One particular area of concern is the fitness of the model. The other is on how the entire process of analysis adheres to the assumption stated within the context of the modelling technique of multivariate analysis using Structural Equation Modelling (SEM).

2.3 External Validity (Generalizability)

As part of the limitation of the study, secondary data together with their availability was a primary concern. In fact, around 40 percent of the countries with missing data and were eliminated from the analysis, as a result. However, the data sets include economic and governance information of the remaining 131 countries, which is enough number to suffice the scope or coverage of this study to ensure generalizability.

2.4 Reliability

The study is based on descriptive correlation, aiming to achieve a mathematical model with a high level of credibility. Using SEM technique, as an objective tool, similar results would be obtained if the same data sets and sample size will be generated by other parties aiming to redo the model.

2.5 Objectivity

The sources of data for this study are the ND-Gain Index Organization, Milken Institute and Central Intelligence Agency. These are organizations linked independently to prime academic institutions, and publish their data online for transparency purposes. Thus, they have no other choice but to measure objectively. That alone allows a slim chance for objectivity to be influenced so much by human skill and perception, which in reality might be a common drawback for using survey questionnaires, at some point.

3. Results and Discussion

3.1 Model Fit (Model 1 versus Model 2)

After the preliminary multivariate analysis or testing multivariate assumptions and data screening, there were two models obtained. First, the proposed model and the second one, the modified model for which an excellent model fit was observed.

Under the first model, probability of getting the Chi Square statistics value of 45.04 is .00, but in the second model, probability is .63 for the Chi Square .229. This alone speaks that there is something interesting and conclusive to look forward to in the second model. When the minimum value of discrepancy (CMIN) is divided by the degrees of freedom, with its restriction principle to ensure unbiased probability, a ratio less than 2 signifies good model fit. Again, with CMIN/df = 22.52, the first model is far behind the second model and with CMIN/df = .229 at a probability value of .63. The goodness of fit index (GFI) reveals that the first model might be good with GFI = .895, but the second model is far better with GFI = .999. A value of 1 for GFI indicates perfect fit. The comparative fit index (CFI) shows that the first model might also be a good model with CFI = .916. However, the second model is quite more than good because of CFI = 1, revealing a perfect model fit. The normed fit index (NFI) is another measure of the model's fitness. A value of 1 or closer to it marks a very good fit. Although NFI = .914 for the first model, the NFI for the second model is 1, which remarkably holds the latter model better than the former. The Tucker-Lewis coefficient suggests that a value closer to 1 is a very good fit. Based on this coefficient, the second model is a good fit because TLI = 1.015, compared to the first model with TLI = .582.

The root mean square error (RMSEA) is a measure for the close fit of the model. A RMSEA of .05 or less indicates a close fit of the model in relation to the degrees of freedom. For the first model, the probability of getting a sample as large as RMSEA = .407 is .00. On the other hand, for the second model, the probability of getting a sample as low as RMSEA = .00 is .68.

Overall, with all the statistical tests to measure the goodness-of-fit of the model reveal that the second model is the best model to use for the estimate.

Table 1. *Model Fit*

Model	$X^{2\,(df)}$	CMIN/df	GFI	CFI	NFI	TLI	RMSEA
1	45.04 (Sig = .00) (df = 2)	22.52 (Sig = .00)	0.895	0.916	0.914	0.582	0.407 (Sig = .00)
2	0.229 (Sig = .63) (df = 1)	0.229 (Sig = .63)	0.999	1.000	1.000	1.015	0.000 (Sig = .68)

By covariating the error estimate for readiness score and vulnerability score, the second model became a better model. Illustration of this covariation is shown in Figure 2.

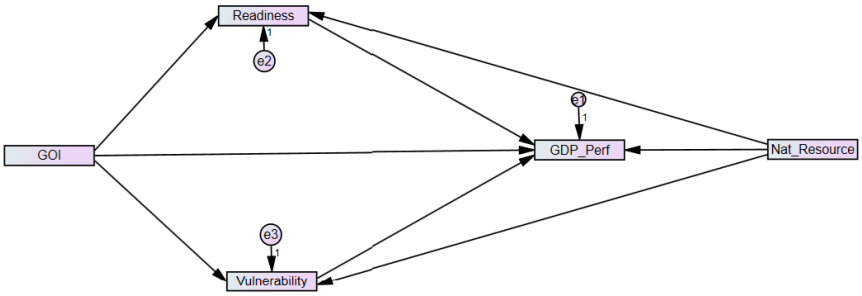

Figure 1. *The proposed model (Model 1) based on the theoretical framework*

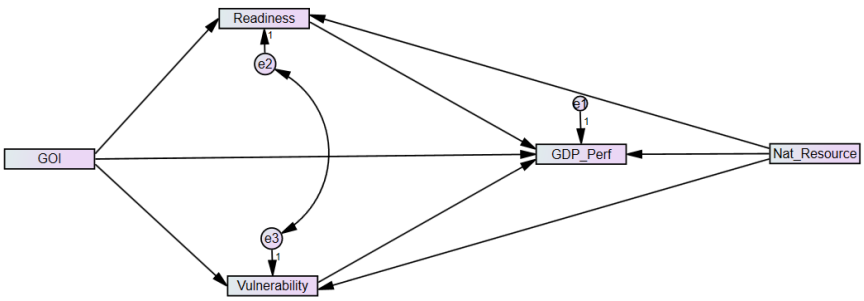

Figure 2. *Modified model (Model 2) based on modification indices result*

Based on Figure 3, when GOI goes up by 1 standard deviation, the readiness score goes up by .91, standard deviation and vulnerability score goes down by .76. This means that when the ability of the nation to attract foreign investment increases, its ability to leverage investments and convert them to adaption increases as well. On the other hand, there is a downfall for this high dexterity to attracting foreign investment because this can lower the country's exposure, sensitivity and ability to adapt to the negative impact of climate change. This must be the case, knowing that according to UN Millennium Project (2006) only the advanced countries have the ability to initiate good governance as far as sustainability issue is concerned. Considering that most of the countries included in the model are developing countries, they have the tendency to attract foreign investment as priority, but along the way, they might not be quite able at establishing the sustainability issue yet, just as the Philippines for instance, as a sample case. This sounds like an interesting viewpoint, as far as the dependency theory is concerned, knowing that economies of developed countries are enriched at the expense of those developing ones.

When GOI goes up by 1 standard deviation, GDP performance goes up by .37. GDP performance goes up by .13 standard deviation when the number of natural resources of economic values goes up by 1 standard deviation. When the number of natural resources of economic importance goes up by 1 standard deviation, readiness score moves up by .04 standard deviation, and vulnerability score goes down by -.13 deviation. Based on the previous discussion as anchored on the fundamental and implication of dependency theory, the number of natural resources of economic importance, especially among developing countries, reduces the government's level of performance in governing the negative impact of climate change. On the other side, it improves the country's ability to leverage investments and convert them to adaptation actions. However, the small value of readiness score from the path of GDP performance to readiness score implies that the number of natural resources of economic importance creates a low capacity of the country to leverage investments and convert them to adaptation actions. For this reason, it may sound that the Dutch disease generally exists in the world, especially among economies that are largely dependent on natural resources for their economic growth. This also implies that since there was only a relatively small value in the path from natural resources to the readiness score, its statistical significance is of primary importance. It is of interest to find if there is something going on to this this path.

Meanwhile, GOI and natural resources explain 83 percent of the variance of readiness score and 59 percent of the vulnerability score. The combined predictors of GDP performance explain 62 percent of its variance. This means that the predictors are quite good requirements to predict the readiness score, vulnerability score and GDP performance of the country.

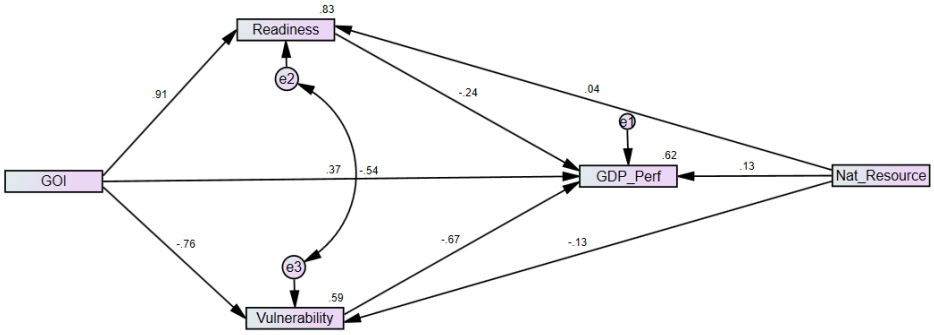

Figure 3. *Standardized estimate of relationship between variables based on standard deviations.*

3.2 Regression Weight

Considering that there was a promising association between the variables, it is of primarily concern to consider their statistical significance with the probability values of their coefficients.

Revealed in Table 2 are the estimates of coefficients for each variable in their respective paths, and the p-values. Only the path for natural resources to readiness score and from readiness score to GDP performance have not-so-remarkable paths in the model. This means that the country's ability to leverage investments and convert them to adaptation does not affect GDP performance. After all, in reality, investors will only invest upon consideration of other important factors such as economic fundamentals, ease of doing business, quality of regulations, and rule of law. This observation was empirically supported by the model as GOI has statistically significant contribution to GDP performance. In fact, when GOI increases by 1 percent, GDP performance rises to around 5.6 percent.

On the other hand, the idea that the number of natural resources affects the ability of the country to leverage investments and convert them to adaptation actions cannot be statistically established. The probability

value for this path is more than α =.05, which is .307. This cannot be established, as there are many countries good at governance level in managing their resources so as not to be affected by Dutch disease, and there are also others, especially developing countries or relatively developed ones, which are affected by policies of developed or investing countries, as in line with the evidence of some studies (Calcagnini, Ferrando and Giombini, 2014; Baumgartner, Braun, Abebaw and Muller, 2015; Chen, Maung, Shi and Wilson, 2014).

When GOI increases by 1 percent, an increase of 10.9 percent in the readiness score is statistically significant. This should be the case, knowing that attracting foreign direct investment is associated with ensuring leveraging investments and converting them to adaptation actions. However, as countries attract investment, their vulnerability to some environmental concerns decreases by 5.9 percent when their capacity to attract FDI increases by 1 percent. Much of the implication of this was explained earlier.

Another important evidence to prove the peril of dependency is marked by the decrease of 5.8 percent in the vulnerability score when the natural resources increase by 1 percent. This suggests that economies may overlook governing the negative impact of climate change, while exhausting their natural resources for economic advantage. In reality, and based on dependency theory, advanced economies take advantage of the resources of poor countries to their advantage.

When the number of natural resources of economic importance increases by 1 percent, readiness score increases by 2.6 percent, which is another indication of attracting FDI, which could suggest that Dutch disease may be hampered at some point, even if it exists generally in the economy of the world.

A 1 percent increase in GOI, natural resources and vulnerability leads to 5.6 percent increase, 11.9 percent increase, and 133 percent decrease in GDP performance, respectively. This only proves that the three predictors are significant components of the model that could predict the economic performance of the country. It sounds that attracting foreign direct investment and the number of natural resources are the factors that provide positive contribution to the economic performance. The percentage of natural resources guarantee GDP performance, which is another remarkable proof that the danger for Dutch disease generally is eminent in the world economy, as far as the literature is concerned (Melina, Yang and Zanna, 2016). Furthermore, it sounds that when countries are quite focused or serious about addressing climate change or sensitive to its issues, the GDP performance will be largely and badly affected. Thus, this proves the finding according to which there is a need to somehow sacrifice policies associated with environmental concerns just to ensure economic growth as an exchange (Chen, Maung, Shi and Wilson, 2014).

Table 2. *Regression weights of the independent variables*

Path			Estimate	S.E.	C.R.	P
Readiness	<---	GOI	.109	.004	25.480	***
Vulnerability	<---	GOI	-.059	.004	-13.601	***
Vulnerability	<---	Nat_Resource	-.058	.026	-2.256	.024
Readiness	<---	Nat_Resource	.026	.026	1.022	.307
GDP_Perf	<---	GOI	.056	.020	2.806	.005
GDP_Perf	<---	Nat_Resource	.119	.050	2.387	.017
GDP_Perf	<---	Readiness	-.308	.198	-1.554	.120
GDP_Perf	<---	Vulnerability	-1.327	.198	-6.710	***

Note: ***The regression weight for predictors in the prediction of dependent variable is significantly different from zero at the 0.001 level (two-tailed).

3.3 Mediation Influence

For the other important part of the study, testing the mediation effect is the main concern of the study.

It shows on Table 3 that readiness score and vulnerability score have only partial mediation effect to the GDP performance. This means that GOI and percentage of natural resources of economic importance have direct effect to GDP performance.

For this reason, the symptom for Dutch disease is evident because of the vulnerability of GDP performance to increase when the percentage of natural resources of economic importance increases. In fact, as stated in Table 2, a 1 percent increase in natural resources adds up around 11.90 percent to the country's GDP performance.

However, GOI, as governance indicator, is another fundamental component to increase GDP performance. Thus, the results of the study add up something to the idea of Ebrahim-zadeh (2003) and *The Economist* (1977). Governance is necessary, and diversification of industries is part of it, due to the consideration of economic fundamentals, ease of doing business, quality of regulations and rule of law.

***Table 3**. The mediation influence of vulnerability score and readiness score to GDP performance*

Relationship	Direct without mediator	Direct with mediator	Remarks
GOI>Read>GDP	0.659 (0.001)	0.408 (0.001)	Partial mediation
GOI>Vul>GDP	0.659 (0.001)	0.415 (0.001)	Partial mediation
Nat>Vul>GDP	0.207 (0.001)	0.131 (0.017)	Partial mediation
Nat>Read>GDP	0.207 (0.001	0.132 (0.015)	Partial mediation

4. Conclusion and Recommendation

The number of natural resources of economic importance plays an important role in the GDP performance. Thus, the preliminary symptom of Dutch disease continuous to manifest for as long as each country aims for development, with their resources as ultimate enticing factors for foreign investment. In addition, economic growth is so far observed to be associated with the vulnerability of the country to climate change. Finally, economic growth was found to be linked to the negative impacts argued by the dependency theory.

The findings imply that in order to ensure growth and not to hamper potential development, good governance is a fundamental factor to directly and partially affect and mediate future economic growth. Good governance is a great contributing factor to the country's GDP performance.

However, future researches are necessary to expand and support the above stated claim to stand conclusive considering that the data in this study consisted of information from developing and developed economies combined in this comprehensive analysis. An insight about focused investigations to be initiated separately for developing and developed countries is a remarkable area of interest for future inquiries.

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Appendices

Annex 1. *Curve estimate between the GDP performance and percentage of nation's resources of economic value*

R Square	F	P-value	Curve estimate
.098	***24.114***	***.000***	***Linear***
-	-	-	Logarithmic
-	-	-	Inverse
.103	12.693	.000	Quadratic
.104	8.553	.000	Cubic
.090	21.944	.000	Compound
-	-	-	Power
-	-	-	S
.090	21.944	.000	Growth
.090	21.944	.000	Exponential
.090	21.944	.000	Logistic

Annex 2. *Curve estimate between the GDP performance and country's global opportunity index (GOI)*

R Square	F	P-value	Curve estimate
.447	***106.765***	***.000***	***Linear***
.440	103.710	.000	Logarithmic

.414	93.193	.000	Inverse
.447	53.037	.000	Quadratic
.449	35.314	.000	Cubic
.406	90.235	.000	Compound
.413	92.950	.000	Power
.403	88.962	.000	S
.406	90.235	.000	Growth
.406	90.235	.000	Exponential
.406	90.235	.000	Logistic

Annex 3. *Curve estimate between the GDP performance and country's vulnerability score*

R Square	F	P-value	Curve estimate
.593	**259.142**	**.000**	**Linear**
.598	264.805	.000	Logarithmic
.575	240.504	.000	Inverse
.600	132.760	.000	Quadratic
.601	88.293	.000	Cubic
.539	208.494	.000	Compound
.519	191.924	.000	Power
.474	160.506	.000	S
.539	208.494	.000	Growth
.539	208.494	.000	Exponential
.539	208.494	.000	Logistic

Annex 4. *Curve estimate between the GDP performance and country's readiness score*

R Square	F	P-value	Curve estimate
.390	***114.861***	***.000***	***Linear***
.363	102.624	.000	Logarithmic
.307	79.854	.000	Inverse
.392	57.595	.000	Quadratic
.395	38.658	.000	Cubic
.280	70.171	.000	Compound
.270	66.651	.000	Power
.239	56.528	.000	S
.280	70.171	.000	Growth
.280	70.171	.000	Exponential
.280	70.171	.000	Logistic

Annex 5. *Relationship between the independent variables*

Test	Pearson r coefficient	P-value	Decision on Ho
Vulnerability vs Readiness	-.824**	.000	Reject
Vulnerability vs GOI	-.762**	.000	Reject
Readiness vs GOI	.908**	.000	Reject

Note: **Correlation is significant at the 0.01 level (2-tailed)

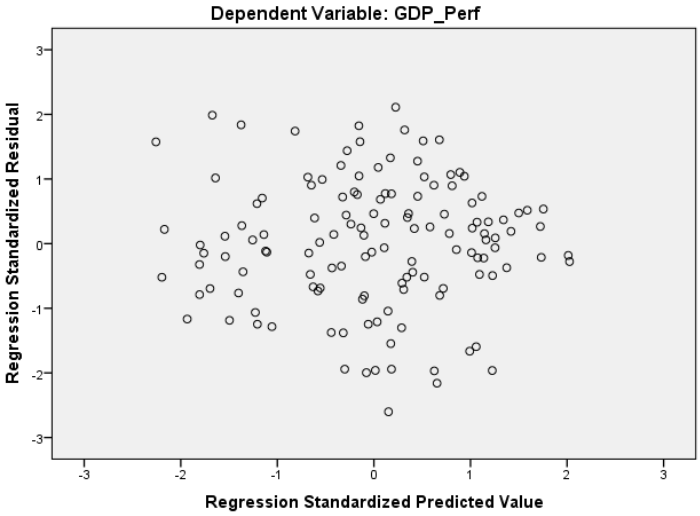
Annex 6. *Collinearity statistics among the independent variables*

Variables	Tolerance	VIF
Vulnerability score	.296	3.383
Readiness	.124	8.057
Global Opportunity Index	.176	5.679

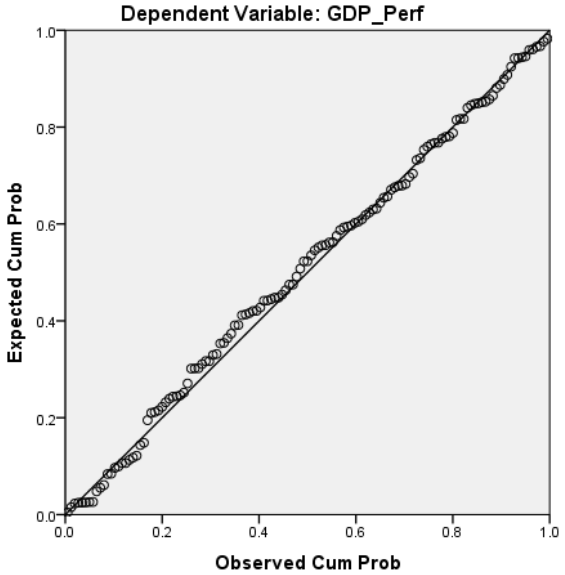
Annex 7. *Collinearity statistics after dropping "readiness" from the independent variables*

Variables	Tolerance	VIF
Vulnerability score	.419	2.385
Global Opportunity Index	.419	2.385

Annex 8. *Scatterplot between the standardized residual and the standardized predicted value*



Annex 9. *Normal P-P plot of regression standardize residual*



Annex 10. *Normality statistics of unstandardized and standardized residuals*

Descriptive	Unstandardized Residuals	Standardized Residuals
Skewness	-.230	-.230
Standard error (Skewness)	.210	.210
z value Skewness	***-1.09***	***-1.09***
Kurtosis	-.220	-.220
Standard error (Kurtosis)	.417	.417
z value Kurtosis	***-.53***	***-.53***

Annex 11. *The Skewness and Kurtosis of distribution for each variable*

Variables	Skewness	Standard Error	Skw z-value	Kurtosis	Standard Error	Kurt z-value
GDP_Perf	-0.233	0.210	1.11	-0.985	0.420	-2.34
Resources	0.683	0.212	3.22	-0.077	0.420	-0.18
GOI	0.141	0.210	0.67	-0.828	0.420	-1.97
Vulnerability	0.402	0.212	1.89	-0.608	0.420	-1.45
Readiness	0.504	0.210	2.40	-0.693	0.420	-1.65