Does foreign aid accelerate economic growth in Yemen?

هل تسرع المساعدات الخارجية النمو الاقتصادي في اليمن؟

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Received: 15/07/2020 *Accepted: 18/10/2020* *Published:26/12/2020*

Abstract:

Foreign aid's major role has been accelerating the wheel of economic growth in developing countries, not to mention its primary role in facing many disasters and the repercussions of the wars that these countries exposed to.The primary objective of this study is to explore the impact of foreign aid on economic development in the Republic of Yemen. A standard model developed that includes time series for GDP as a dependent variable and both foreign aids, foreign direct investment, exports of goods and services, and oil rent as independent variables.Time-series properties diagnosed and error correction model estimated. Overall results indicate that all independent variables, including foreign aid, have had a long-term impact on economic growth. However, the effect of foreign aid has had a negative impact on economic growth for reasons that may be related to the limited efficiency of the uses of that aid.

Keywords: Yemen, foreign aid, economic growth, cointegration, error correction model, stability tests
JELClassificationCodes:F43, F63, O4

ملخص:

تساهم المساعدات الأجنبية في تسريع عجلة النمو الاقتصادي في البلدان الفقيرة ناهيك عن دورها الأساسي في مواجهة الكثير من الكوارث، وتداعيات الحروب التي تتعرض لها تلك البلدان، .تهدف هذه الورقة البحثية لدراسة أثر المساعدات الأجنبية على التنمية الاقتصادية في اليمن، حيث تم تطوير نموذج قياسي يضم سلاسل زمنية عن الناتج المحلي الإجمالي كمتغير تابع وكل من المساعدات الأجنبية، الاستثمار الأجنبي المباشر، إجمالي الصادرات من السلع والخدمات، والعائد من النفط كمتغيرات مستقلة.

تم تشخيص خصائص السلاسل الزمنية وتطوير وتقدير نموذج تصحيح الخطأ. تشير النتائج الإجمالية إلى أن جميع المتغيرات المستقلة بما فيها المساعدات الخارجية كان لها تأثير على المدى الطويل في النمو الاقتصادي. ومع ذلك ولكن جاء تأثير المساعدات الخارجية سلبي على النمو الاقتصادي لأسباب ربما تتعلق بمحدودية كفأة أوجه استخدام تلك المساعدات

كلمات مفتاحية: اليمن، المساعدات الخارجية، النمو الاقتصادي، نموذج تصحيح الخطاء، اختبارات | الاستقرار

تصنيفاتJEL: F43, F63, O4

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1. INTRODUCTION

Significant multilateral official aid and assistant have bee provided to less developed countries. The focus of such assistance and assistance targeted, mainly, areas of the economy which are well-thought-out to arouse economic growth. Foreign aid generally was planned to alleviate poverty and to surge infrastructural development. However, international assistance does not always welcome or recognized. Because it is supposed that official foreign assistant and aid act as an income transfer, which may or may not lead to economic growth—suggested that the outcome depends on whether foreign aid utilized to finance capital investment or consumption expenditures (Burnside and Dollar, 2000).

Indeed, the volume of foreign aid to developing countries deteriorated by one-third in real terms in the 1990s (World Bank, 1998), possibly because donor countries assume that it no longer attains its anticipated aims. In the meantime, in 2011, the net official development assistance has enlarged remarkably, as the case of Yemen. The aggregate value of grants received increased from 4.5 billion $ to 79.85 billion $ during the period 1990-2018, (figure 1).

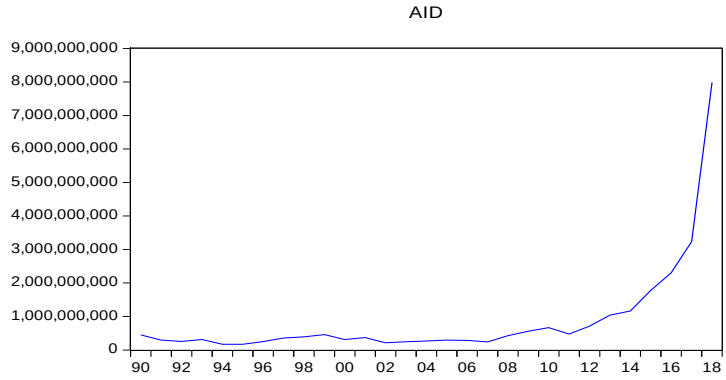


Figure 1:Net Official Foreign Aid and Assistant, Source: World Bank.

Figure 1 above shows a graphical representation of net official foreign aid and assistant delivered to Yemen.

This study aims to examine, empirically, the effectiveness of foreign aid in Yemen is contributing to economic growth.

The present study based on annual time-series data for Yemen, and it covers the period 1990-2018. The reason behind selecting Yemen for this study because it considered a significant recipient of official foreign assistant and aid in the region.

Problem Statement

Developing countries face enormous challenges to achieve real and sustainable development due to limited and scarce economic resources. These countries seek to develop the available resources in addition to using the foreign aid that they obtain either from other countries or international organizations such as the World Bank, the International Monetary Fund, and other douners. Developing countries differ in the efficiency of using foreign aid according to the nature of the economic and political system, administrative governance, etc. That is why this paper seeks to determine the extent to which Yemen benefits from foreign aid in economic growth.

Research Question

This study addresses an important question;

Does foreign aid accelerate economic growth in Yemen?

Research Objectives

This study conducted with the primary objective of investigating the relationship between foreign aid and economic development in Yemen among other macroeconomic variables (Foreign direct investment, exports of goods and services and oil rent). More specifically, it aims to:

1- determine the long-term relationship between foreign aid and economic development in Yemen;
2- examine the short-term relationship foreign aid and economic development in Yemen; and
3- test the causality patterns between foreign aids, exports of goods and services, foreign direct investment, oil rent, and economic development in Yemen.

Research Importance

The importance of this research consists of two folds; 1) revealing the major contribution of foreign aid to accelerate economic development, and 2) introducing viable recommendations to assist the policymakers in developing their strategic plans in terms of rationalizing the use of foreign aid to accelerate economic development.

Research Methodology

It is critical to address the following issues before moving forward with the analysis;

a) check and maintain time-series stationarity, and the variables cointegration.With the presence of aunit root in time series, it is essential first to take the differences of the variables, thereby eliminating the unit root and achieving stationarity before attempting to estimate the model. For this purpose, (Dickey and Fuller,1979; Phillips and Perron,1988) tests, and the Durbin-Watson Statistic suggested by Sargan, and Bhargava (1983) applied to decide whether the time series are stationary in first differences or levels.

b) a cointegration test of Johansen and Juselius (1990) used to establish a long-run equilibrium relationship among foreign aid, foreign direct investment, gross domestic product, exports of goods and services, and oil rent.

c) to model the dynamic adjustment of the model, an error-correction procedureis of Engle and Granger (1987) used.

2. Literature Review

Official foreign assistant and aid have been under significant debates and controversial points of view since the early 1950s of the last century. And all these points of view tried to assist the effectiveness of foreign aid on economic development.

Albiman (2016) analyzes the impact of foreign aid on economic growth. The research uses time series analysis by applying the Dynamic Ordinary Least Square (DOLS), standard unit root test of Augmented Dickey-Fuller Test(ADF), and Philips and Perron test (PP) to test whether the data are stationary or not.

The paper concludes that foreign aid harms economic growth. Furthermore, in the short-run, the research has found that foreign aid does not cause economic growth. The results suggest that the government has to reconsider the type of foreign assistance that is received.

Ereghaet al. (2016), published a study that analyzed the efficiency of official economic assistance on per capita GDP growth. They covered different regions in Sub-Sahara Africa. The study uses data from 1970 to 2013 for thirty-three Sub-Saharan African countries. It employs the panel data cointegration and panel data and error correction modeling approach. The study concludes that official development assistance found to have a positive and insignificant effect on West Africa, East Africa,

and non-oil exporting countries.

Still, the impact was positive and significant for Southern Africa, Central Africa, and Oil-exporting countries. And for West Africa, the effect became substantial on growth only when macroeconomic policy environment variables captured.

Appiah-Konadu et al. (2016) analyze the effect of foreign aid on Ghana's economic growth. The study finds out the short-and long-run relationship between foreign aid and economic growth. they used time-series data from 1972-2012 and applied the ARDL and error correction term approaches to test the links. The study found that capital, labor, and government expenditures had a positive effect on the economic growth in Ghana both in the short-and long-run. However, interest payments and foreign aid harmed the economic growth of Ghana.

Adamu (2013) explored the impact of foreign aid on economic growth in different countries of the West African States. The researcher uses panel data for the 1990-2009 periods and a three-equation simultaneous- equations model.

The paper concludes that the effects of foreign aid on economic growth among these ECOWAS countries found to be positive and robust. The results from the equation on foreign aid indicated that domestic investment, exports, and international reserves have a positive relationship with foreign aid.

Malik(2008),in a paper of Foreign Aid and Economic Growth: A Cointegration Analysis of the Six Poorest African Countries, looks at the effectiveness of foreign aid on economic growth. The author concludes that there is a long-run relationship between the per capita income, foreign aid, and investment. The paper further adds that the long-run effect of foreign aid on economic growth found to be negative.

Furthermore, in early studies, Chenery and Strout (1966), measured official foreign aid and assistant as a factor that lessens either the domestic saving restriction or the foreign exchange restriction, whichever is binding. Also, they mention that official foreign aid and assistant surges the rate of investment and the level of income in the economy by complementing its available possessions.

Griffin and Enos (1970), yet, argued that foreign aid does not contribute to economic growth and that it fails to foster democratic political regimes. Instead, international financial support could retard economic development by depressing the domestic savings rate. They tested this hypothesis using a bivariate regression model with cross-sectional data for 32 developing countries. They concluded that official foreign assistant and aid inflow to developing countries triggered domestic savings rates to fall.

Papanek's (1973) inferences are consistent with Griffin's and Enos's (1970) finding of a negative association between foreign aid and domestic savings. However, he challenged their assertion of a causal relationship, with external official aid assistant foremost to compact internal reserves.

Papanek (1973), mentioned that a country might receive more official foreign aid and assistant through times of economic catastrophe once the domestic savings rate truncated. Thus, the causation ought to run from the overall economic complaint, of which domestic savings is one pointer, to the inflow of foreign aid.

Bowels(1987) ran a Granger causality test to analyzed this relationship, using annual data from 1960 to 1981 for 20 developing countries. His results, yet, were unpersuasive, assumed that the nature and the direction of causality diverse across countries. Moreover, results for half of the sample countries did not display any underlying association among savings and official foreign aid.

Furthermore, to explore the relationship between official extraneous assistant and aid, and economic growth, some economists have straight regressed official foreign aid on the gross national product and finished with contrasting outcomes. For instant, Papanek (1973) came up with a positive and

substantial association among foreign aid and economic development, while Voivodas (1973) found a negative correlation between foreign aid and economic growth.

Mosley, et al, (1987), using aggregate, cross-sectional data, stated a negative and statically significant association for the period 1960-1970. On the other hand, a negative and insignificant association for the 1970-1980 and 1980-1983 time frames.

3. Empirical Analysis:

3.1. Data

All-time series about variables under consideration obtained from both, the world bank and IMF databases for the period 1990 to 2018. Figure 2 plots the time series of the variables under consideration.

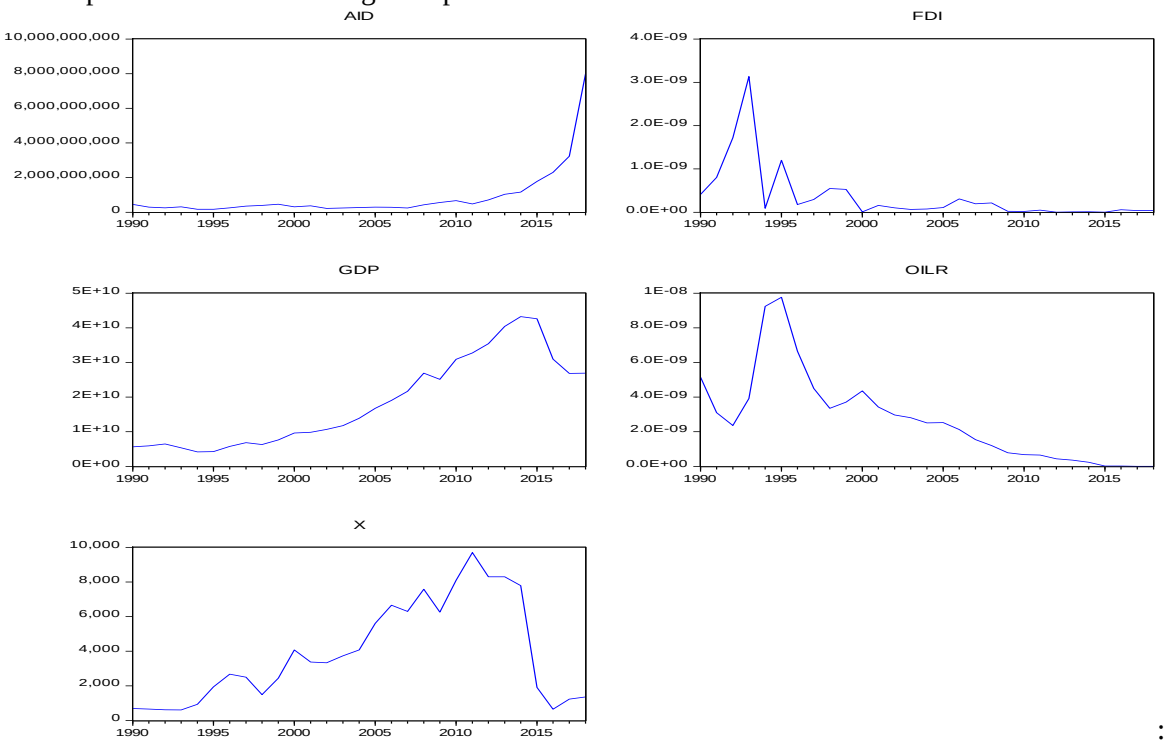


Figure 2: Plotting the Variables

3.2. Research Variables

This research focuses on investigating the impact of foreign aid on economic growth in Yemen. The financial aid represented by the Net official development assistance and official aid received (AID). The other variables under consideration consist of Gross Domestic Product (GDP), Foreign Direct Investment (FDI), Exports of goods and services (X), and oil rent (Oilr) are taken from the World Bank and IMF from 1990 to 2018.

3.3. The Initial Model:

The variables used to build the initial model is; Gross domestic product treated as the dependent variable and Net official aid and assistance received, Foreign direct investment, exports of goods and services, and Oil rent treated as independent variables.

Equation 1 represents the initial model:

$$GDP = f(AID, FDI, X, OILR) \qquad (1)$$

It indicates that GDP is the function of AID,FDI,X, and OILR, and it may represented in econometric formas:

$$Y_{it} = b_0 + b_1 AID_t + b_2 FDI_t + b_3 X_t + b_4 OILR_t + \varepsilon_t \qquad (2)$$

Where:

Y: represents Gross Domestic Product
AID: denotes Net official development assistance and official aid received
FDI: denotes Foreign Direct Investment,
X: represents the Exports of goods and services,
OILR: is Oil rent
t: is a time
ε is the error term

Taking natural logarithm (Ln) for all variables to ensure linearity and adding error term (ε), the initial model will become as follows*:*

$$Y_{it} = b_0 + b_1 LnAID_t + b_2 LnFDI_t + b_3 LnX_t + b_4 LnOILR_t + \varepsilon_t \qquad \ldots\ldots\ldots (3)$$

Estimation of the initial model (equation 3) reported in table 1 below:

Table 1: Estimating the initial model
Dependent Variable: LNY
Sample: 1990 2018
Included observations: 29

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNAID	1.011560	0.090295	11.20285	0.0000
LNFDI	-0.031353	0.061888	-0.506609	0.6169
LNX	0.598487	0.110476	5.417363	0.0000
LNOILR	0.113670	0.072516	1.567511	0.1296
R-squared	0.718984	Mean dependent var		23.36424
Adjusted Rsquared	0.685262	S.D. dependent var		0.779855
SE of regression	0.437510	Akaike info criterion		1.312009
Sum squared resid	4.785383	Schwarz criterion		1.500602
Log likelihood	-15.02414	Hannan-Quinn criter.		1.371074
Durbin-Watson stat	0.809372			

The results reveal several key points. First, the R-square value (0.718984) is quite high, and the Durbin-Watson statistics (0.809372) is not close to 2, indicating that our module is a spurious or non-sense model, which leads us to perform the stationarity test over the time series.

3.4. Unit Root Test

As many macro variables are non-stationary, to ensure that the data are stationary, the Unit Root Test was performed first before Co-integration Test. This test used to avoid spurious regression. In this study, we apply two sets of unit root tests for stationarity, namely the Augmented Dickey-Fuller (ADF) and the

Philips-Perron(PP) tests (Dickey and Fuller,1979; Phillips and Perron,1988).The outcomes shown in table2 below.

Table (2): Unit Root Test Results

ADF UNIT ROOT TEST					
Variable		ADF value (constant		ADF value (constant and linear trend	
		Level	First differenced	Level	First differenced
Y		-0.858431	-3.457235	-2.200234	-3.417356
AID		8.116555	2.324425	6.890540	3.803843
FDI		-1.909702	-3.197462	-1.971716	-2.497247
X		-1.431339	-4.337925	-0.783512	-4.552635
Oilr		-3.391987	-2.499945	-0.252871	-4.276042
Critical values	1%	-3.689194	-3.699871	-4.339330	-4.339330
	5%	-2.971853	-2.976263	-3.587527	-3.587527
	10	-2.625121	-2.627420	-3.229230	-3.229230
PP UNIT ROOT TEST					
Variable		PP value (constant included)		PP value (constant and linear trend included)	
		Level	First differenced	Level	First differenced
Y		-0.978759	-3.457235	-1.491067	-3.417356
AID		8.116555	18.87474	7.192638	27.36508
FDI		-3.389499	-12.43668	-4.700427	-12.10996
X		-1.550438	-4.308912	-0.904869	-4.508510
Oilr		-1.070460	-3.432214	-1.836745	-3.376105
Critical values	1%	-3.689194	-3.699871	-4.323979	-4.339330
	5%	-2.971853	-2.976263	-3.580623	-3.587527
	10	-2.625121	-2.627420	-3.225334	-3.229230

Notes:*indicates significance at one percent or rejection of the null of no unit root at the one Percent level.

**indicates significance at five percent or rejection of the null of no unit root at the Five percent level.

***indicates significance at ten percent or rejection of the null of no unit root at the Ten Percent level.

The PP tests reveal that all variables integrated of order one, both with and without linear trends and intercept terms.

The results from the table (2) indicate that all variables except Foreign Aid are non-stationary at the level with intercept or intercept and trend (with t-statistics less than the critical values at 1%, 5%, and 10%). After taking the first difference, all variables became stationary, with intercept, or with intercept and trend (with t-statistics less than the critical values at 1%, 5%, and 10%). As for the Foreign Aid variable, both tests indicate that it is stationary at the level in both cases (with intercept or intercept and trend).

3.5 Cointegration Test:

The cointegration test resultsof Johansen and Juselius (1990) reported in table 3 below:

Table (3) Cointegration Test

Rank	Max-Eigen Statistic	Critical Value (Eigen) at 5%	Prob.**	Trace Statistic	Critical Value (Trace) at 5%	Prob.**
None * (r=0)	46.45629	33.87687	0.0010	91.05393	69.81889	0.0004
At most 1* ($r \leq 1$)	17.56143	27.58434	0.5320	44.59764	47.85613	0.0980
At most 2 ($r \leq 2$)	14.64639	21.13162	0.3144	27.03620	29.79707	0.1007
At most 3 ($r \leq 3$)	11.38558	14.26460	0.1359	12.38982	15.49471	0.1392
At most 4 ($r \leq 4$)	1.004236	3.841466	0.3163	1.004236	3.841466	0.3163

Trace and Max-eigen value tests indicate 1 cointegrating equation (s) at the 0.05 level.
*designates rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The results from table 3 show that both Maximum Eigen Statistic and Trace Statistic are a presence of cointegration among all variables at 5 percent levels. It means that the long-run association between LnY, LnAID, LnFDI, LnX, and LnOilr, does exist.

At the null hypothesis, the Trace Statistic value is 91.05393, which is higher than the Critical Value (Trace) 69.81889at a significance level of 5 percent, and the P-value (0.0004) is less than 0.05, indicating that we can reject the null hypotheses. This Trace Statistic result clarified that this equation has the long-run relationship between variables at a significance level of 5 percent.

Also, for the Trace Statistic based on the rank $r \leq 1$, the values are less than Critical Value (Trace). At the rank $r \leq 1$, the Trace Statistic value is 44.59764 less than Critical Value (Trace) of the 47.85613 at a significance level of 5 percent and the P-value (0.0980) is higher than 0.05, which means we cannot reject the null hypotheses. This Trace Statistic result clarified that this equation has the long-run relationship between variables at a significance level of 5 percent.

However, at the Max-Eigen Statistic, as the value in rank $r = 0$ is 46.45629 higher than the Critical Value (Eigen) of 33.87687, and the P-value (0.0010) is less than 0.05, which means we can reject the null hypothesis. The result shows that the relationship between variables in the long-run at a 5 percent significance level does exist.

Also, for the Max-Eigen Statistic from rank $r \leq 1$, the values are less than Critical Value (Eigen), which same as the case of Trace Statistic and Critical Value (Trace). At the rank $r \leq 1$, the Max-Eigen statistic value is 17.56143 less than Critical Value (Eigen) of 27.58434 at a significance level of 5 percent, and the P-value (0.5320) is higher than 0.05, which means we can reject the null hypotheses.

In conclusion, since all variables are cointegrated (have long-run associations), we can move forward to estimate the error correction model. The results also reveal that cointegration implies causality in at least one direction, and this determined by employing a vector error correction model (Vector Error Correction Model).

3.6. Error Correction Model:

In proceeding to estimate the error correction model, we have to determine the number of lages to include as follows:

3.6.1 Lag selection

Table 4: Results of the Lag Selection
VAR Lag Order Selection Criteria
Endogenous variables: Y AID FDI X OILR
Date: 05/08/20 Time: 22:39
Sample: 1990 2018
Included observations: 27

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-469.0684	NA	1.23e+09	35.11618	35.35615	35.18753

1	-343.3413	195.5755	731778.0	27.65491	29.09473	28.08305
2	-290.6667	62.42917*	116596.1*	25.60494*	28.24461*	26.38985*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

The results from the lag selection criterion in table 4 indicate that all the five selection criteria recommend two lags and that what shall follow with the rest of the empirical analysis.

3.7.2 VECM:

All the variables in the cointegrating equation assumed to be endogenous in a VAR structure. So, the VECM builds on this by making use of differenced data and lagged differenced data for the chosen variables in a VAR structure.

An essential element of the VECM is the error correction term or factor. The coefficient of the error-correction term theoretically expected to be negatively expressed with a value between zero and one. This result ensures that the equilibrium in the error correction within the system over time will be at least meaningful.

Atypical VECM, in its purest form, appears as shown in equation(4) below:

$$\Delta Y_t = b_0 + \sum_{i=1}^{n} b_1 \Delta \mathrm{Ln} Y_{t-i} + \sum_{i=1}^{n} b_2 \Delta \mathrm{Ln} AID_{t-i} + \sum_{i=1}^{n} b_3 \Delta \mathrm{Ln} FDI_{t-i} + \sum_{i=1}^{n} b_4 \Delta \mathrm{Ln} X_{t-i} + \sum_{i=1}^{n} b_5 \Delta \mathrm{Ln} Oilr_{t-i}$$
$$+ \varphi_1 \mathrm{Ln} AID_{t-1} + \varphi_2 \mathrm{Ln} FDI_{t-1} + \varphi_3 \mathrm{Ln} X_{t-1} + \varphi_4 \mathrm{Ln} Oilr_{t-1} + \sum_{i=1}^{n} \varphi_5 EC_{t-1}$$
$$+ + \varepsilon_t \dots \dots \dots \dots \dots \dots \dots (4)$$

Y: gross domestic product
AID: foreign aid
FDI: Foreign Direct Investment
X: Exports of Goods and Services
Oilr: Oil Rent
Ln : the natural logarithm
EC: Error correction term (vector)
ε: Error term
Δ: Difference
b_i: Short-run coefficients
φ_i: Long-run coefficients
t: time
i: number of lags

The results from estimating equation 4 (Vector Error correction model) reported in table 5 below:

Table (5): Vector Error Correction Model Estimation

Vector Error Correction Estimates
Included observations: 26 after adjustments

Cointegrating Eq:	CointEq1
LNY(-1)	1.000000
LNAID(-1)	-4.085237
	(1.53004)
	[-2.67003]
LNFDI(-1)	0.372436
	(0.44940)
	[0.82874]
LNX(-1)	-3.668111
	(0.70743)
	[-5.18512]
LNOILR(-1)	-3.152171
	(0.88413)
	[-3.56527]
C	31.26943

Error Correction:	D(LNY)	D(LNAID)	D(LNFDI)	D(LNX)	D(LNOILR)
CointEq1	-0.057594	-0.038489	0.373093	0.007095	0.163944
	(0.01940)	(0.04990)	(0.23262)	(0.06446)	(0.09585)
	[-2.96824]	[-0.77128]	[1.60386]	[0.11007]	[1.71039]
R-squared	0.623658	0.470008	0.686883	0.547940	0.363003
Adj. R-squared	0.327960	0.053586	0.440863	0.192751	-0.137496
Number of coefficients	65				

From table 5 above, we can see that there is one cointegration equation, and the value of The error correction term is negative (-0.057594), as expected, and Standard errors in ( ) & t-statistics in [ ]. Even though we have values for the t-statists, but we need to know the P-value for each variable to be sure whether to accept or reject the null hypothesis.

And to obtain the P values, we constructed a system of equations and got 65 coefficients for 5 models as reported in appendix (A).
From the system of equations obtained in the previous step, we estimate model 1 as it shown bellow;

D(LNY) = C(1)*(LNY(-1) - 4.08523738655*LNAID(-1) + 0.372435906664*LNFDI(-1) - 3.66811080943*LNX(-1) - 3.15217061746*LNOILR(-1) + 31.269427393) + C(2)*D(LNY(-1)) + C(3)*D(LNY(-2)) + C(4)*D(LNAID(-1)) + C(5)*D(LNAID(-2)) + C(6)*D(LNFDI(-1)) +

C(7)*D(LNFDI(-2)) + C(8)*D(LNX(-1)) + C(9)*D(LNX(-2)) + C(10)*D(LNOILR(-1)) + C(11)*D(LNOILR(-2)) + C(12)

Where,

D(LNY) is the change in Gross Domestic Product (dependent variable), and,

C1 is the coefficient of cointegrating model "(LNY(-1) - 4.08523738655*LNAID(-1) + 0.372435906664*LNFDI(-1) - 3.66811080943*LNX(-1) - 3.15217061746*LNOILR(-1) + 31.269427393)".

Estimating the above model, and the results are reported in the table (6) below:

Table 6: Results from Estimating
Dependent Variable: D(LNY)
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 05/09/20 Time: 00:44
Sample (adjusted): 1993 2018
Included observations: 26 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.057594	0.019404	-2.968242	0.0102
C(2)	-0.752413	0.471257	-1.596607	0.1327
C(3)	-0.524662	0.341254	-1.537453	0.1465
C(4)	-0.119108	0.120138	-0.991427	0.3383
C(5)	-0.106861	0.125256	-0.853146	0.4079
C(6)	0.027907	0.017933	1.556177	0.1420
C(7)	0.022964	0.018853	1.218044	0.2433
C(8)	0.190918	0.156087	1.223147	0.2415
C(9)	0.067802	0.169758	0.399404	0.6956
C(10)	-0.208759	0.126901	-1.645051	0.1222
C(11)	-0.219205	0.192522	-1.138598	0.2740
C(12)	0.050743	0.047179	1.075524	0.3003

R-squared	0.623658	Mean dependent var	0.054864
Adjusted R-squared	0.327960	S.D. dependent var	0.154916
SE of regression	0.126997	Akaike info criterion	-0.985268
Sum squared resid	0.225796	Schwarz criterion	-0.404608
Log likelihood	24.80848	Hannan-Quinn criter.	-0.818059
F-statistic	2.109107	Durbin-Watson stat	1.913627
Prob(F-statistic)	0.094898		

From the estimation of the model above, we can realize that R-squared is 0.623658 higher than 60%, so we accept the model. Also, C (1) represents the error correction term (-0.057594), which indicates the speed of adjustment towards equilibrium.

Thus, we need to discuss two crucial issues: a) Long-run causality and b) Short-run causality.

a) Long-run causality:

If the C(1) is negative in sign and significant, we can say that there is a long-run causality running from Foreign Aid (AID), Foreign Direct Investment (FDI), Exports of Goods and Survives (X), and Oil Rent (OILR) to Gross Domestic Product (Y)

b) Short-run causality:

We need to check whether each independent variable cause change towards the dependent variable or not, as follows:

i) AID(-1), AID(-2)=0 or not, in other words, we need to check whether C(4), C(5) =0 or not.
ii) FDI(-1), FDI(-2)=0 or not, in other words, we need to check whether C(6), C(7) =0 or not.
iii) X(-1), X(-2)=0 or not, in other words, we need to check whether C(8), C(9) =0 or not.
iv) OILR(-1), OILP(-2)=0 or not, in other words, we need to check whether C(10), C(11) =0 or not. And to do so, we run the Wald test, (results reported in Table 7 below):

Table 7: Results from Wald Tests

Equation: AID Causing Y

Test Statistic	Value	df	Probability
F-statistic	0.643462	(2, 14)	0.5403
Chi-square	1.286925	2	0.5255

Null Hypothesis: C(4)=C(5)=0

Equation: FDI Causing Y

Test Statistic	Value	df	Probability
F-statistic	1.289746	(2, 14)	0.3061
Chi-square	2.579491	2	0.2753

Null Hypothesis: C(6)=C(7)=0

Equation: X Causing Y

Test Statistic	Value	df	Probability
F-statistic	0.757461	(2, 14)	0.4871
Chi-square	1.514922	2	0.4689

Null Hypothesis: C(8)=C(9)=0

Equation: OILR Causing Y

Test Statistic	Value	df	Probability
F-statistic	1.363343	(2, 14)	0.2878

Chi-square	2.726685	2	0.2558

Null Hypothesis: C(10)=C(11)=0

Results reported in Table 7 revealed the following findings of the short-run causality running from the independent variables to the dependent variable, as follows;

Foreign Aid (AID): The Chi-square p-value is 52.55%, and greater than 5%, meaning that we cannot reject the null hypotheses C(4)=C(5)=0.

There is no short-run causality running from AID to the dependent variable Y.

Foreign Direct Investment (FDI): The Chi-square p-value is 27.53%, and greater than 5%, meaning that we cannot reject the null hypotheses C(6)=C(7)=0.

There is no short-run causality running from FDI to the dependent variable Y.

Exports of Goods and Services (X): The Chi-square p-value is 46.89%, and greater than 5%, meaning that we cannot reject the null hypotheses C(8)=C(9) =0.

There is no short-run causality running from X to the dependent variable Y.

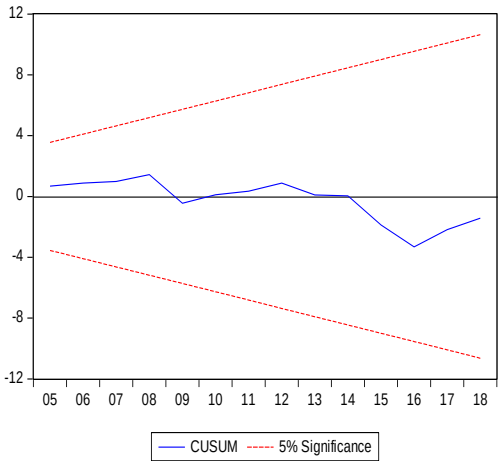
Oil Rent (Oilr): The Chi-square p-value 25.58% and greater than 5%, meaning that we cannot reject the null hypotheses C (10)=C(11)=0.

There is no short-run causality running from OILR to our dependent variable Y.

AS a summary of causality between the independent variables and dependent variable, we can say there is a long-run causality running from AID, FDI, X, and OILR to Y, but in the short run non of the variables have a short-run causality running to Y. And having reached this conclusion about the short-run causality running from the independent variable to the dependent variable, we need to proceed to test the stability of the model.

3.8. Model Stability:

To check whether our model stable over time, CUSUM and CCUSUMQ stability tests performed, as shown in figures 3 & 4 bellows:



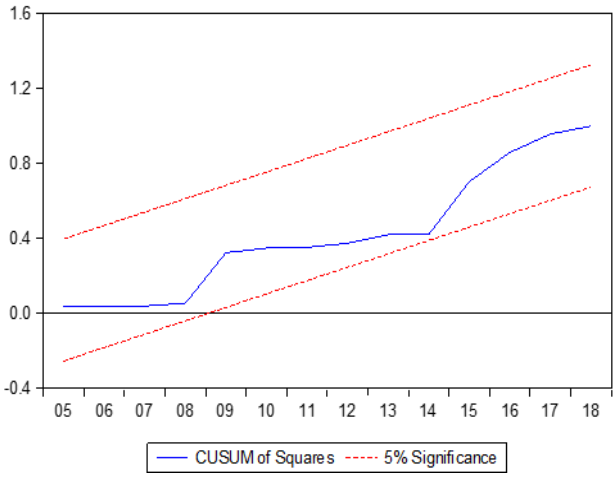


Figure 3: CUSUM Stability Test

Figure 4: CUSUMQ Stability Test

The straight lines characterize the critical bounds at a 5% significance level

Figures 3 and 4, sisplay the plots for both the CUSUM and CUSUMQ statistics do not cross the critical bounds, indicating stability in the VECM.

4. Conclusion and Summary:

Investigating the impact of foreign aid on economic development has been an important topic for decades. Some studies suggest that foreign aid in developing countries play a crucial role in stimulating economic development. In contrast, there is another line of studies that revealed a negative or weak impact of foreign aid on economic growth.

As the case of Yemen, the results indicate a negative effect (-4.085237) of foreign aid on economic development, and statistically significant (-2.67003).

Several factors can explain the negative association between foreign aid and economic growth, including:

A - Weak governance, bribery, financial and administrative corruption.
B- Theseparation war of attempting to secede the south from the north in 1994, and the resultingimbalances in the administrative apparatus of the state.
C- The four fights in the Northern regions, starting from 2004 and its repercussions to the present time.
D- The collapse of state institutions after 2011 and the war that continues until now.

Besides, exports of goods and services, and oil rent have negative impacts, with coefficients equal to -3.668111, -3.152171, and t-statistics equal to -5.18512, -3.56527, respectively.
On the contrast, foreign direct investment found the only variable that contributed positively to economic development, with a coefficient equal to 0.372436 and a significant t-statistic equal to 0.82874.

Furthermore, the study revealed that the error correction term is negative in sign (-0.057594), as expected, and statistically significant (-2.968242). That implied a long-run causality running from Foreign Aid (AID), Foreign Direct Investment (FDI), Exports of Goods and Survives (X), and Oil Rent (OILR) to Gross Domestic Product (Y).

On the other hand, the results indicated no short-run causality coming from all independent variables to the dependent variables.

The results from estimating the vector error correction model showed that R-squared is 0.623658 greater than 60%, so we accept the model. Besides, the Durbin-Watson statistic is 1.913627, meaning no serial correlation among the time series.

Finally, the model was found stable from using both, the CUSUM and CUSUMQ statistics do not cross the critical bounds, indicating stability in the VECM.

Policymakers should be aware of the long run as well as the short-run causality effect coming from foreign aid, foreign direct investment, exports of goods and services, and oil rent.

Also, the state's policymakers must act seriously and decisively to find remedies and solutions that reduce bribery and financial & administrative corruption that hinder the benefit from foreign donations and aid provided to the state.

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6. Appendices

Appendix (A): Results from estimating System of Equations

Model 1:

D(LNY) = C(1)*(LNY(-1) - 4.08523738655*LNAID(-1) + 0.372435906664*LNFDI(-1) - 3.66811080943*LNX(-1) - 3.15217061746*LNOILR(-1) + 31.269427393) + C(2)*D(LNY(-1)) + C(3)*D(LNY(-2)) + C(4)*D(LNAID(-1)) + C(5)*D(LNAID(-2)) + C(6)*D(LNFDI(-1)) + C(7)*D(LNFDI(-2)) + C(8)*D(LNX(-1)) + C(9)*D(LNX(-2)) + C(10)*D(LNOILR(-1)) + C(11)*D(LNOILR(-2)) + C(12)

Model 2:

D(LNAID) = C(13)*(LNY(-1) - 4.08523738655*LNAID(-1) + 0.372435906664*LNFDI(-1) - 3.66811080943*LNX(-1) - 3.15217061746*LNOILR(-1) + 31.269427393) + C(14)*D(LNY(-1)) + C(15)*D(LNY(-2)) + C(16)*D(LNAID(-1)) + C(17)*D(LNAID(-2)) + C(18)*D(LNFDI(-1)) + C(19)*D(LNFDI(-2)) + C(20)*D(LNX(-1)) + C(21)*D(LNX(-2)) + C(22)*D(LNOILR(-1)) + C(23)*D(LNOILR(-2)) + C(24)

Model 3:

D(LNFDI) = C(25)*(LNY(-1) - 4.08523738655*LNAID(-1) + 0.372435906664*LNFDI(-1) - 3.66811080943*LNX(-1) - 3.15217061746*LNOILR(-1) + 31.269427393) + C(26)*D(LNY(-1)) + C(27)*D(LNY(-2)) + C(28)*D(LNAID(-1)) + C(29)*D(LNAID(-2)) + C(30)*D(LNFDI(-1)) + C(31)*D(LNFDI(-2)) + C(32)*D(LNX(-1)) + C(33)*D(LNX(-2)) + C(34)*D(LNOILR(-1)) + C(35)*D(LNOILR(-2)) + C(36)

Model 4:

D(LNX) = C(37)*(LNY(-1) - 4.08523738655*LNAID(-1) + 0.372435906664*LNFDI(-1) - 3.66811080943*LNX(-1) - 3.15217061746*LNOILR(-1) + 31.269427393) + C(38)*D(LNY(-1)) + C(39)*D(LNY(-2)) + C(40)*D(LNAID(-1)) + C(41)*D(LNAID(-2)) + C(42)*D(LNFDI(-1)) + C(43)*D(LNFDI(-2)) + C(44)*D(LNX(-1)) + C(45)*D(LNX(-2)) + C(46)*D(LNOILR(-1)) + C(47)*D(LNOILR(-2)) + C(48)

Model 5:

D(LNOILR) = C(49)*(LNY(-1) - 4.08523738655*LNAID(-1) + 0.372435906664*LNFDI(-1) - 3.66811080943*LNX(-1) - 3.15217061746*LNOILR(-1) + 31.269427393) + C(50)*D(LNY(-1)) + C(51)*D(LNY(-2)) + C(52)*D(LNAID(-1)) + C(53)*D(LNAID(-2)) + C(54)*D(LNFDI(-1)) + C(55)*D(LNFDI(-2)) + C(56)*D(LNX(-1)) + C(57)*D(LNX(-2)) + C(58)*D(LNOILR(-1)) + C(59)*D(LNOILR(-2)) + C(60)