The impact of foreign aid and FDI on economic growth:

The case of Egypt

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Abstract

Foreign aid provides humanitarian assistance and economic assistance to developing countries. This research paper examines the impact of foreign aid on economic development in. An econometric model is developed to explain the Egypt aggregate output, including total labor force, capital stock, foreign aid, government expenditures and the real exchange rate. Annual time-series data from 1990-2013 are used to estimate the model. Before carrying out the estimation, the time series properties are diagnosed and an error correction model is developed and estimated. Overall results suggest that, in the short run, foreign aid has positively contributed to economic growth. However, the impact of foreign aid in the long run has contributed negatively to economic growth due to different policy implementations of foreign aid.

Key words: Egypt, foreign aid, economic growth.

Introduction

Considerable multilateral aid into LDCs has been focused on areas of the economy which are considered to stimulate economic growth. Foreign aid generally was intended to help alleviate poverty, to provide emergency relief, to assist with peacekeeping efforts and to increase infrastructural development. However, this assistance is not always welcomed or accepted, because it is believed that foreign aid acts as an income transfer, which may or may not lead to growth, which suggested that the outcome depends on whether foreign aid is used to finance capital investment or consumption expenditures (Burnside and Dollar, 2000).

In fact, foreign aid to developing countries declined by one-third in real terms in the 1990s (World Bank, 1998), perhaps because donor countries assume that it no longer achieves its desired objectives. Meanwhile, on 2011 the net official development assistance has increased notably (see figure 2). Furthermore, as of the case of eygp, the total value of grants received increased from ٤،٣ billion $ to ٩٨،٥ billion $ during the period (2010 / 2011- 2013/2014), (see table 1).

Table (1): The evolution of the size of grants to the Egyptian economy during the period (2010 / 2011- 2013/2014) Billion dollars

grants items		/٢٠١٣ ٢٠١٤	/٢٠١٢ ٢٠١٣	/٢٠١١ ٢٠١٢	/٢٠١٠ ٢٠١١
grants from foreign governments (a)		٩٨,٢	٤،٨	٩،٣	٥،٣
Ongoing		٨١،٧	٤،١	٨،٤	٢،٢
Capitalism		١٦,٥	،٧	،٩	١،٣
grants from international organizations (b)		،١	،١	،١	،٣
Ongoing		٠	٠	٠	٠
Capitalism		،١	،١	،١	،٣
grants from government agencies (c)		،٠٢	،٣	،٧	،٥
Ongoing		٠	١،	١،	،١
Capitalis		٢،	٢،	٦،	،٤

m					
Total value of grants (A B C)		٩٨،٥	٥،٢	١٠،١	٤،٣

Source: Egyptian Ministry of Finance, the final account of the general budget of the state, different numbers.

Figure 1 shows a map of African countries' dependence on foreign official development assistance, 2008 (as a %of GNY).

The purpose of this study is to examine empirically the effectiveness (impact) of foreign aid in Egypt in an effort to assess the relative effectiveness of foreign aid in contributing to economic growth.

The present study is based on an annual time-series data for Egypt and it covers the period 1990-2013. This country has been selected because it has been recognized as a major recipients of foreign aid in the middle east.

Literature Review

The issue of foreign aid has been under significant debates and controversial point of views, since early fifty's of the last century, as to the effectiveness of foreign aid on economic development.

In an early study, H.B. Chenery and A.M. Strout (1966) considered foreign aid as a factor that relaxes either the domestic saving constraint or the foreign exchange constraint, whichever is binding. According to them, foreign aid increases the rate of investment and the level of income in the economy by supplementing its available resources.

K. Griffin and J.L. Enos (1970), however, argued that foreign aid does not contribute to economic growth, and that it fails to foster democratic political regimes. Instead, foreign economic assistance could retard economic development by lowering the domestic savings rate. The authors tested this hypothesis using a bivariate regression model with cross-sectional data for 32 developing countries, and concluded that foreign aid inflows to developing countries caused the domestic savings rate to fall.

G. Papanek's (1973) conclusions are consistent with Griffin's and Enos' (1970) finding of a negative association between foreign aid and domestic savings, although he challenged their assertion of a causal relationship, with foreign aid leading to reduced domestic savings.

According to Papanek (1973), a country receives more foreign aid during times of economic crisis, when the domestic savings rate is low. Therefore, the causality should run from the general economic condition, of which domestic savings is one indicator, to the inflow of foreign aid.

P. Bowels (1987) applied a Granger causality test to this relationship, using annual data from 1960 to 1981 for 20 developing countries. His findings, however, were inconclusive, given that the nature and the direction of causality varied across countries. In addition, results for half of the sample countries did not show any causal relationship between savings and foreign aid.

To analyze the relationship between foreign aid and economic growth, some researchers have directly regressed foreign aid on the gross national product, and ended with contradictory results. For example, Papanek (1973) found a positive and significant relationship between foreign aid and economic growth, while C.S. Voivodas (1973) found a negative relationship between these two variables. P. Mosley, J. Hudson and S. Horrel (1987), using aggregate, cross-sectional data, reported a negative and significant relationship for the period 1960-1970, but a negative and insignificant relationship for the 1970-1980 and 1980-1983 timeframes.

Empirical Analysis

Early studies that have been conducted on the estimation of foreign aid and its impact on growth rate had found a contradictory results. This paper ‘ll try to investigate the relationship between foreign aid and its impact on gross domestic product as a measure of economic growth. Several initial comments about the paper are worth making.

First, it starts by establishing the time-series properties of the individual variables. The aim here is simply to show that the variables are integrated of the same order. The sampling distribution of the OLS estimator is not well behaved if the disturbance is non-stationary: the distribution of OLS estimator does not have finite moments, and furthermore, OLS is inconsistent in general.

If a unit root is present, it is essential to first difference the variables, thereby eliminating the unit root and achieving stationarity before attempting to estimate the model. For this purpose, this paper used the Augmented Dicky-Fuller (ADF) test as recommended by Engle and Granger (1987) in addition to the Durbin-Watson Statistic suggested by Sargan and Bhargava (1983) to determine whether the time series are stationary in first differences or levels.

Second, Cointegration test is used to establish a long-run equilibrium relationship among gross domestic product (Y), foreign aid (FA), government expenditure (GE), capital (K), labor (L), and the real exchange rate (RER)

Third, modeling the dynamic adjustment of the model, we use the Error-Correction procedure. The error-correction methodology follows that in Engle and Granger (1987).

Data Sources:

Throughout the International Financial Statistics (IFS) CD released by the International Monetary Fund (IMF), a historical annually data about Egypt covering the period (1990 – 2013) was obtained.

Methodology:

The empirical analysis will be carried in the following steps:-

- Model Specification.
- Testing for Statioary Series.
- Cointegration Equations.
- Error-Correction Model.
- The Results
- Summary and Conclusion

Model Specification:

The Initial Model: It is well known in the literature, that the standard economic growth model using output level in an economy is determined by the availability of factors of production, which can be expressed as follows:

$$Y = f(K, L), \qquad (1)$$

where Y denotes the output level (real gross domestic product (GDP)), K denotes the amount of capital, and L denotes the amount of labor. Assuming constant technology, any increase in the amount of labor and/or capital will increase the level of output in the economy. After adding foreign aid (FAID), government expenditure (GE), and the real exchange rate (RER), equation (1) can be written as:

$$Y = f(K, L, FAID, GE, RER) \qquad (2)$$

In equation (2), it has been expected that the K and L coefficients, as measures of domestic capital and labor supply, respectively, be positively related to Y. Based on previous literature, the expected effect of foreign aid on the level of output is undetermined.

Since government expenditures are expansionary, the "GE" (government expenditure) coefficient is expected to be positive. Recent studies have been inconclusive about the effect of the real exchange rate on the output of the economy. In general, it is assumed that currency

depreciation improves the current account balance, which, in turn, increases the level of output in the economy. If this is the case, the "RER" (real exchange rate) variable carries a positive coefficient.

However, R. Cooper (1971), and P. Krugman and L. Taylor (1978) argued that, if the demand for imported goods is inelastic, then currency depreciation may be contractionary. In addition, negative real balance- and supply-side effects stemming from exchange rate depreciation may reduce the level of output (Upadhyaya, 1999; Upadhyaya and Upadhyay, 1999; and Upadhyaya, Dhakal and Mixon, 2000). If this is the case, then "RER" may carry a negative coefficient.

And after taking the natural logarithm (Ln) for all variables to insure linearity and adding error term (ε), the initial model will become as follows:

$$LnY_t = a_0 + \beta_1 LnK_t + \beta_2 LnL_t + \beta_3 LnFAID_t + \beta_4 LnGE_t + \beta_5 LnRER_t + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots (٣)$$

Where :
Y: gross domestic product
Faid: foreign aid
GE: government expenditure
K: capital
L: labor
RER: the real exchange rate
Ln : the natural logarithm
ε : the error term
t: the time period

Testing for Stationary Series:

Unit Root Tests should be performed before applying Cointegration tests, because statistical inference from time series is usually based upon the assumption of stationarity.

This study employs the augmented Dicky-Fuller test. The null hypothesis of nonstationarity is tested against the alternative of stationarity and is investigated for Y, K, L, FAID, GE, and RER.

To this end, we employ the ADF test and report the results in table 1.

Table 2: Stationary test of each variable
using Augmented Dicky Fuller (ADF) procedure

Variable	With no Trend	With Trend
LnY	-1.383872 *	-3.622843 *
LnK	-1.811934	-3.433168
LnL	1.193715	-4.046979
LnFaid	2.713328	0.827903
LnGe	0.351841	-4.157303
LnRer	-4.078009	-2.422111
ΔLnY	-2.32495 **	2.304556 **
ΔLnK	-3.565407	-3.217407
ΔLnL	-4.869960	-4.729417
ΔLnFaid	-5.002958	0.768811
ΔLnGe	-3.863378	-2.775882
ΔLRer	-3.284838	-3.152070

Notes: * The Mackinnon (1996) critical values for the ADF test that includes a trend is -3.644963 at the usual 5% level. The comparable figure with no trend in the test is - 3.029970.

** The Mackinnon (1996) critical values for the ADF test that includes a trend is -3.658446 at the usual 5% first difference. The comparable figure with no trend in the test is -3.020686.

Taking the first differencing for all series induce stationarity, which implied that all the series are integrated of order one …I~(1).

Testing for Cointegration:
Applying Johansen and Juselius test, the results are reported in table 3.

Table 2: Johansen's maximum Likelihood Results (r = number of co-integrating vectors).

Panel A: The Results of Trace Tests					
NO of CE(s)		Eigen value	Likelihood Ratio (LR)	5 Percent Critical Value	1 Percent Critical Value
Null	**Alternative**				
r = 0	r = 1**	0.982791	159.3633	94.15	103.18
r <=1	r = 2*	0.733689	69.99226	68.52	76.07
r <=٢	r = ٣	0.566146	40.88431	47.21	54.46
r <=3	r = 4	0.447591	22.51327	29.68	35.65
r <=٤	r = ٥	0.295563	9.456993	15.41	20.04
r <=٥	r = ٦	0.076429	1.749166	3.76	6.65
*(**) denotes rejection of the hypothesis at the 5%(1%) level Trace test indicates 2 cointegrating equation(s) at the 5% level Trace test indicates 1 cointegrating equation(s) at the 1% level					

Panel B: Estimate of Co-integrating Vectors	
Co-integrating Eq	CointEq1
LnY(-1)	1.000000
LnK(-1)	-0.437576 (0.01346) [-32.5093]
LnL(-1)	-0.149196 (0.02324) [-6.41914]
LnFaid(-1)	0.071366 (0.00335) [21.3012]
LnGe(-1)	-0.389548 (0.02105) [0.76845]
C	-4.855230

The eigenvalues are presented in the second column, while the second column (Likelihood Ratio) gives the LR test statistics:

$$Q_r = -T\sum_{i=r+1}^{k}\log(1-\lambda_i)$$

for r = 0, 1,…,k-1 where λ_i is the i-th largest eigenvalue. Q_r is so-called trace statistic and is the test of $H_{1(r)}$ against $H_{1(k)}$.

To determine the number of co-integrating relations r, subject to the assumptions made about the trends in the series, we can proceed sequentially from r = 0 to r = k-1 until we fail to reject. The first row in table (2) tests the hypothesis of no co-integration, the second row tests the hypothesis of one co-integrating relation, the third row tests the hypothesis of two co-integrating relations, and so on, all against the alternative hypothesis of full rank, i.e. all series in the VAR are stationary.

As can be seen, the null of no co-integration, as well as the null of at most one co-integrating vector, are rejected because the values of the trace statistics are greater than the critical value. However, the null of at most two co-integrating vector cannot be rejected in favor of r =3. Thus, there are two vectors among the variables of the economic growth function.

Error Correction :

The error correction model would be presented in equation ٤, after adding the error component (EC_t), the result is reported in table (4) bellow.

$$dLnY_t = a_0 + \beta_1 LnK_t + \beta_2 LnL_t + \beta_3 LnFAID_t + \beta_4 LnGE_t + \beta_5 LnRER_t$$
$$+ \delta_1 dLnK_t + \delta_2 dLnL_t + \delta_3 dLnFaid_t + \delta_4 dLnGE_t + \delta_5 dLnRER_t + EC_t + \varepsilon_t \text{.....(4)}$$

Table (4) : Estimation Results for after adding the error correction component
Dependent Variable: DLY

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.025810	2.503623	2.007415	0.0847
LnY	0.480127	0.365850	1.312358	0.0847
LnK	-0.302365	0.126399	-2.392142	0.0480
LnL	-0.002295	0.488625	-0.004698	0.9964
LnFaid	**0.005898**	**0.016760**	**0.351917**	**0.7353**
LnGe	0.319434	0.371604	0.859608	0.4185
LnRer	-0.005439	0.006495	-0.837325	0.4301
dLnK	0.281133	0.161184	1.744170	0.1246
dLnL	-0.283089	0.543193	-0.521157	0.6183
dLnFaid	**-0.010150**	**0.020329**	**-0.499274**	**0.6329**
dLnGe	0.263350	0.228014	1.154972	0.2860
dLnRer	0.006950	0.008207	0.846886	0.4251
EC	-0.358964	0.189089	-1.898391	0.0994

R-squared	0.998728	Akaike info criterion	-3.992203
Adjusted R-squared	**0.996546**	Schwarz criterion	-3.344977
Durbin-Watson stat	**1.930940**	F-statistic	457.8420
		Prob(F-statistic)	**0.000000**

The Results:

The estimated result for equation (٤) reported in table (4) above seems to be consistent in terms of the coefficient of determination, (**Adjusted R-squared=0.996546**), the Durbin-Watson test (**1.930940**), and the Prob F-Statistics (**0.000000**).

The study showed that foreign economic aid to Egypt was a weak positive impact on the Egyptian economy in the short term with a coefficient (β_3 = **0.005898**) and a t-statistic (t=**0.351917**), while the long-term impact was negative and weak with a coefficient (δ_3 =-**0.010150**) and a t-statistic (t=**-0.499274**).

This contradictory results between the short run and the long run, perhaps it is because in the final analysis is due to the fact that foreign economic aid to Egypt was aimed mainly to support the political and social stability and preserving the elements of the existing political system, and then the total foreign aid received by the Egyptian government recently was directed to mainly to service sectors in the economy , which is working to provide the basic needs of citizens, and was not intended to support the structural productive activities that contribute to the high economic growth rates in Egyptian society in the long run .

In equation (4), of those independent variables that carried apriori hypotheses (i.e. K, L, and GE), all had theoretically expected signs, although not all are statistically significant. The coefficient of capital (K), though positive, is not significantly different from zero, whereas the coefficient of labour (L) is positive and statistically significant. As expected, the GE coefficient is positive and statistically significant. The RER coefficient, for which there has not been an a priori expectation, is negative and statistically significant. On the one hand, currency devaluation is generally thought to improve the overall terms of trade, leading to an improvement in the country's trade balance, thus expanding aggregate output and employment. Others argue that devaluation may lead to a negative real balance effect, resulting in lower levels of aggregate demand and output. The results in this research note are consistent with this second line of reasoning (see Upadhyaya, 1999; Upadhyaya and Upadhyay, 1999; Upadhyaya, Dhakal and Mixon, 2000). The focus of this study, however, is on the coefficient for foreign aid (FAID). The present study finds the FAID coefficient to be positive (0.005898) and statistically insignificant (0.351917) in the short run.

Summary and Conclusion:

This study has examined the impact of foreign aid on economic grpwth in Egypt. The model includes total labour force, capital stock, foreign aid, government expenditure and the real exchange rate to explain the output level. To estimate the model, time series data from 1990-2013 are used. Before carrying out the estimation, the time series properties of the time series data are diagnosed and an error correction model is developed and estimated.

Overall results indicate that, foreign aid to Egypt has a contradictory results in the short run vs. the long run. For the short run, it was a weak positive impact on the Egyptian economy with a coefficient (β_3 = **0.005898**) and a t-statistic (t=**0.351917**), while for the long-run, the impact was negative and weak with a coefficient (δ_3 =**-0.010150**) and a t-statistic (t=**-0.499274**).

These results indicate that, foreign aid (Official Development Assistance) to Egypt was contributed in closing a large part of the deficit in the current account balance of payments transactions during the year (2013-2014), where the Egyptian government was able to end the net deficit to deal with the outside world.

During this year's surplus, in the overall balance, of the balance of payments was estimated at $ 1.5 billion added to the cash reserve of the state to reach the size of the reserve by the end of the fiscal year (2013-2014) with about $ 16.7 billion, which led to avoid balance of payments deficit, which who would have been $ 10.4 billion, which was expected to be reflected negatively in turn on foreign cash reserve, and the latter was expected to fall to $ 5 billion, which was what the Egyptian economy cannot endure.

These foreign aids have contributed in the treatment of expected imbalance in the state budget that could occur as a result of the high deficit in the state budget, which could be up in the absence of such assistance to 350.5 billion pounds, up to 17.2% of the GDP volume, and what could have been caused by reflections from high prices and high unemployment rates in the light of the decline in operating rates and slow economic performance.

It is clear that the impact of foreign economic aid on the Egyptian economy in the short term was positive to a certain extent where the aid was used during the year 2013/2014 in the financing packs of first economic activation and the second, which was aimed at easing the burden on the shoulders of the Egyptian family in exempting students from tuition fees, and expenses of university cities, providing school meals for students, and to provide comprehensive health insurance coverage for the family, and the delivery of natural gas to homes, and the provision of social housing for low-and middle-income, according to the official website of the Ministry of Planning (www.mop.gov.eg).

In addition, some studies suggest that 75% of the total foreign economic aid to Egypt go to the associations of civil society and human rights bodies are not employed in the structure of economic activities help raise economic growth rates

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Figure (1): African countries' dependence on foreign ODA, 2008 (as a %of GNY)