The Impact of Foreign Aid on Economic Growth in Cambodia:

A Co-integration Approach

Heng Hokmeng

Paññāsāstra University of Cambodia,
Phnom Penh, Cambodia

Pahlaj Moolio

Paññāsāstra University of Cambodia,
Phnom Penh, Cambodia

Abstract

The purpose of foreign aid is to stimulate economic growth in aid-recipient countries; yet, literature review reveals mixed results: inconclusive or often controversial findings. By using time series annual data from 1991 to 2012, and applying Johansen's multivariate co-integration test with vector error correction model (VECM) and the innovative accounting (variance decomposition and impulse response function analysis) techniques, this study aims to examine the long run and short run impact of foreign aid on Cambodia's aid-dependent economy; two other variables such as inflation, and government consumption expenditure are also included in the model. The results of the model show that foreign aid has a significantly positive impact on economic growth in the long run in Cambodia. In addition, foreign aid also has an influence on inflation and may cause it to rise in the short run and in the long run. The model also confirms that foreign aid and inflation positively affect government expenditure in the long run.

Keywords: Foreign Aid, Economic Growth, Johansen's Multivariate Co-integration, Vector Error Correction Model, Cambodia.

JEL Classification: **L26**

Introduction

In the past half century, foreign aid has emerged as a prominent strategy by developed countries and multinational institutions to help alleviate poverty, induce economic growth, and raise living standards in aid recipient countries. In theory, aid provides the lesser developed countries (LDCs) with capital to finance investments for developments. Although, it is beneficial for most economies; however, some studies show negative effects of aid toward some sectors in aid recipient countries.

In the aid literature, various theoretical and empirical studies have been conducted on LDCs to determine the actual effects of foreign aid on economic growth. For example, pro-aid researchers (Nelson, 1956; Sachs, *et al*, 2004; Burnside & Dollar, 1997, 2000, 2004; Hansen & Tarp, 2001; Dalgaard *et al*, 2004; and Camelia & Sanjay, 2009) found a positive impact of foreign aid on economic growth. However, Bauer (1972), Griffin & Enos (1970), Boone (1996), Lensink & White (2001), Easterly (2003), Malik (2008), and Hamid (2013), while challenging this finding, proved on the grounds that aid is ineffective, contributing to the anti-aid literature. Despite having an enormous literature on this subject, a consensus has not been reached on the impact of aid on growth, and yet the results are still inconclusive (Ekanayake & Chatrna, 2010; Mcmillan, 2011; and Tadesse, 2011), suggesting that aid and growth are neither positively, nor negatively related. These paradoxical results obtained in various studies conducted on aid recipient countries and anecdotal views of prominent development economists demand that this subject needs further study.

In Cambodia, after the Khmer Rouge era of devastation, it was realized that the foreign policies are important to support country's development. Thus, the Paris Peace Accord was signed in 1991, which gained international support and attracted foreign aid for Cambodia. Relatively, throughout the years, foreign aid inflows have increased substantially, and Cambodia has experienced remarkable economic growth. However, the questions are

raised whether foreign aid has contributed to economic growth in any way for the country, or does it inhibit growth in the long run? To a certain extent, what is known is that economy is heavily dependent on foreign aid to finance the capital for the investments and projects of socio-economic developments.

Literature Review

The framework for relationship between foreign aid and economic growth found its basis on two important theoretical models, known as the "two-gap model", and the "poverty trap model", most commonly used by development economists to analyze the aid-growth relationships in the past few decades.

Theoretical Literature

- **The two-gap model.**

Chenery and Strout (1966) were among the first economists who introduced the two-gap model, emphasizing the importance of the model in projecting the macroeconomic impact of foreign aid. The model determines the relationship between two components: investment and growth, and savings and growth. Gaps occur if investment is below the desired level, and these gaps can be the savings gaps, or the foreign exchange (trade) gaps. Foreign capital is regarded as a determinant of growth needed to fill these gaps in order for the recipient country to grow. It also requires continuous and incremental inflows to ensure the stimulation of growth. The two-gap model is widely used in aid-growth research by academics, institutions, and the World Bank. However, there has been criticism in more recent studies by Easterly (2003), and Harms & Lutz (2004), who claim that the model is no longer relevant for modern studies.

- **The poverty trap model.**

The poverty trap model was introduced by Nelson (1956, cited by Mcmillan, 2011). The basis of this model assumes that growth is hindered by poverty traps caused by several

factors such as weak production or weak savings. The poverty trap limits the country's capacity to grow, whereas foreign aid is regarded as a temporary relief injection of capital to help raise the economy get out of the poverty trap, and to foster growth. Sachs, *et al* (2004) expanded this model, observing Africa's case, and asserted that if a country can get over a certain income threshold, it takes off economically, suggesting that aid has a powerful effect on developing countries by lifting them out of poverty. On the contrary, Harms & Lutz (2004) criticized the model, and claim that the relief injection provides only a temporary cure to poverty, as the model does not consider other influencing factors such as good governance, and sound policies. It is also evident in recent study by Lensink & White (2001), who found that excess inflows of aid would yield negative returns to growth.

Empirical Studies

There are a range of empirical studies analyzing impact of aid on economic growth, yielding paradoxical results or controversial conclusions. Much of these studies apply earlier statistical techniques, such as OLS, 2LS, GMM, Linear Regression, and basic inferential statistics, developed many decades ago with their own specifications and functions, which may not be accurate to determine long run relationships. However, a more accurate technique to capture long run dynamics introduced by Johansen (1988), known as the co-integration test, is applied by various economists such as Mallik (2008), Tadesse (2011), Hamid (2013), and Mitra (2013). This technique has a good reputation in forecasting impacts between endogen macroeconomic variables. In this section, we review the aid literature based on the statistical techniques and findings.

Anti-aid studies

The anti-aid literature dates back to the seventies such as Griffin & Enos (1970), using simple correlation technique on panel data, found that there is a negative relationship between aid and growth in 27 countries. Bauer (1972) revealed that aid is ineffective, suggesting that

foreign aid must be eliminated. It is dangerous for recipient countries as it increases the power of few elites, which lead to corruption, and hinder economic growth, though much of the research is constrained with limited econometric techniques.

One among the most cited references is by Boone (1996), in which author uses simple linear regression, and found no significant or positive influence of aid on growth, and that aid does not promote what it should, such as investment and reduce poverty, but what it should not such as more corruption, this case is aligned with previous studies of aid ineffectiveness. Another study by Lensink & White (2001), via devising the Aid Laffer Curve, found that aid is ineffective even when given to countries with good policies; moreover, excess levels of aid inflows cause negative returns for recipient countries. One among the most renowned anti-aid economists of the 20th century is Easterly (2003), who concludes that foreign aid has been historically ineffective in promoting growth, and large sums of aid are undesirable.

The extensions of previous studies have been carried out by using much more sophisticated techniques to ensure efficiency of the results. Using the co-integration approach, Mallik (2008) found that the more aid a developing country receives, the more aid dependent it becomes, significantly the evidence shows that 5 out of 6 countries in Africa have significant negative long run effects of aid on economic growth. The use of co-integration approach has also been recently used by Tadesse (2011), in which author found that the overall impact of aid on economic growth in Ethiopia turns out to be negative due to the lack of good policies; this study is also aligned with the findings of Burnside & Dollar (2000). Hamid (2013), applying a similar approach in the case of Egypt, also found that there is a significant negative impact of foreign aid on economic growth in the long run and in the short run.

Pro-aid studies

Many pro-aid economists believe that foreign aid in fact promotes growth in recipient countries. To a certain extent, economic institutions and policies are the main determinants of long term growth. Burnside & Dollar (1997) are among the most renowned economists, who utilize OLS regression in their research and found that the presence of good economic policy environment promotes aid effectiveness. Economic growth of developing countries depends largely on their own economic policies. Based on Burnside & Dollar (2000), the findings have been established in a wide range of development studies. In highly distorted economies, aid is dissipated in unproductive state expenditures. It acts as an income transfer, which produces growth if invested so that domestic output can increase, or it becomes less effective if it is consumed. Conversely, a country with poor policy environment results in the failure to fully absorb the aid. An extension of this study has also been confirmed by Hansen & Tarp (2001); the findings indicate that the aid impact on growth is via investments, and not through consumption. Burnside & Dollar (2004) re-evaluated, and their research was based on a new set of data to focus on the 1990s; their evidence still supported the views that the impact of aid depends on the quality of state institutions and policies. Moreover, another recent study by Dalgaard, Hansen & Tarp (2004) using an OLG model also found that aid has a significant positive impact on productivity in many countries.

It is important to evaluate the macroeconomic impact of aid on growth. Moreira (2005) conducted a cross country study, using OLS and GMM, and concluded that aid did have less effect on growth in the short run than in the long run. This finding suggests that earlier researcher's work on aid-growth was in the line with the newer studies. It was also supported via another study by Camelia & Sanjay (2009), stating that aid promotes long run growth, the effect is significantly large and robust.

In another recent country based study of Nigeria, using the neo classical modeling analytical framework, Fasaya & Onakoya (2012) found that aid inflows have a significant impact on economic growth, and aid provides free resources to increase domestic investments. Kurihara (2014) through an impulse response function of various aid recipient countries, affirms that aid promotes growth via international trade and investments, and show the impact of foreign aid in general has a short term impact at the best of one or two years.

Mixed evidence

There are some studies that reveal mixed results, such as Ekanayake & Chatrna (2010) conducted a panel data analysis and concluded with a mixed impact of aid on growth and is statistically insignificant for African countries.

Furthermore, Mcmillan (2011) analyzes that foreign aid has mixed effects on economic growth, and no conclusive evidence is found that the aid and growth are positively or negatively correlated. Tadesse (2011), utilizing the co-integration approach with special variables derived from Burnside & Dollar (2000), also found mixed results for Ethiopia, based on growth equation, study revealed that aid contributed positively to economic growth in the long run, but the short run effect appeared to be insignificant. However, when aid is interacted with policy, the growth impact of aid is negative, implying the deleterious impact of bad policies on growth in the long run. This implies that the role of inefficient policies has a diminishing effect for aid on growth.

Nonetheless, the wide range of empirical studies focus on panel data, and not country specific, in which most country's situation and characteristics may differ to determine the effectiveness of aid. It is crucial to understand that the effect of aid on growth cannot be generalized for all countries, because each country has its own features, and growth is affected by different variables.
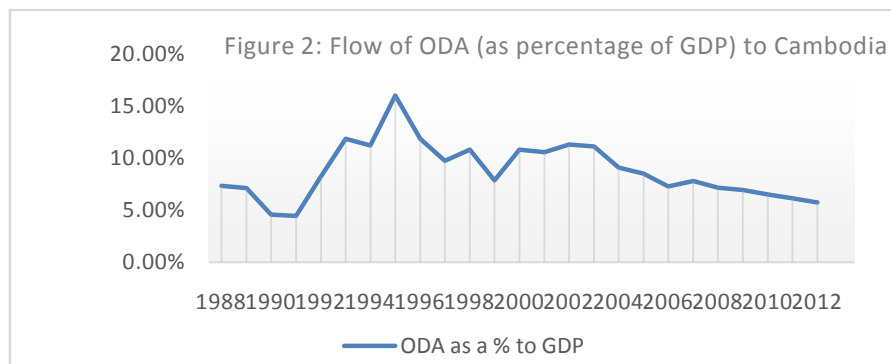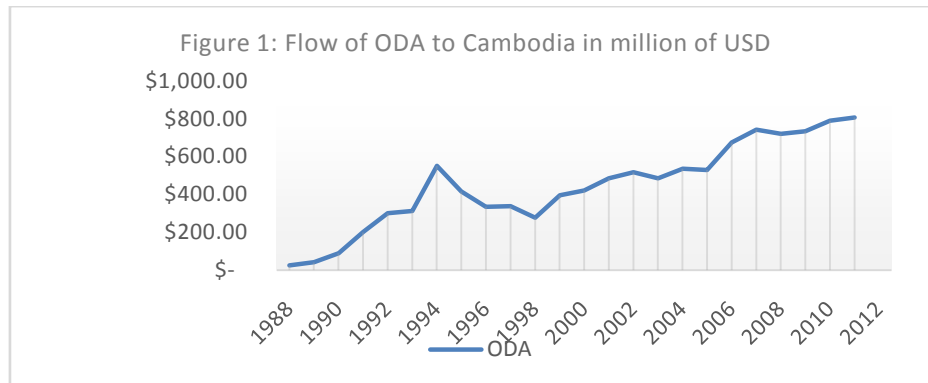
Overview of Foreign Aid to Cambodia

Cambodia, once the pearl of Asia, had a competitively strong economy and a highly organized society. However, much of it was changed due to decades of political chaos, internal conflicts, and civil wars. In result, Cambodia became one among the poorest countries in the Southeast Asia with crippled institutions. After signing of the Paris Peace Accord in 1991, Cambodia has taken the steps in a comprehensive sustainable development process.

The accord was a milestone, enabling Cambodia to work in close cooperation with the UN to ensure peace and security. The UN has coordinated relief assistance, estimated to be over billions of dollars. The transfers to Cambodia are in the forms of program loans, project aids, commodity aids, technical assistance, and emergency reliefs, etc. It is evident that most of these contributions led to major developments in various sectors, and more importantly Cambodia is transformed from being a central-based economy to more market oriented, which has contributed significantly towards growth. On the contrary, there are those who have different claims, such as Sophal (2012) showed that external funds are ineffective, and it does not reduce income inequality, but it enriched and empowered the elites.

Even though, there are many negatives claims on the effectiveness of aid, foreign donors continue to provide aid to Cambodia, and the country remains strongly committed to its economic development. It became a member of ASEAN and WTO in 1999, and 2004 respectively. This shows the commitments towards strengthening its integration into the world, and standardizing its policies to attract more investments and aid. In results, in terms of GDP growth, the country's economic performance has been proven to be quite impressive in the last two decades.

In recent years, Cambodia has achieved macroeconomic stability of stable inflation averaging at 4.2%, stable exchange rates, and the GDP growth averaged at 7.6% from 2004

to 2013, the GDP per capita has risen from US$735 to US$1,035 (RGC, 2013). According to the IMF (2013), gross domestic product is projected to grow at a steady and constant rate of 7.25%, as economic activity remains strong driven by robust exports, construction, garment, tourism, and the service sectors. ADB Report (2013) also stated that Cambodia is projected to grow at the same rate, as EU and USA economies recover.

Figure 1: Flow of ODA to Cambodia in million of USD

Figure 2: Flow of ODA (as percentage of GDP) to Cambodia

The net foreign aid increased dramatically over the years with its highest record of US$807 millions in 2012, and it has accumulated over billions of dollars (see figure 1) being injected into the Cambodian economy in the efforts to foster growth. However, in figure 2, data shows that the percentage of ODA relative to GDP gradually decreased over the years. This indicates that Cambodia is decreasing its dependency of aid as the economy grows. However, data does not account for Chinese aid, as China is a non-OECD country. According to an OECD Report (2013), the top 3 donors of aid for Cambodia in the year 2011-2012 were Japan, ADB, and Australia. The report also indicated that ODA's bilateral funds were

channeled to finance debts, education spending, economic infrastructure, and services, as well as health, and welfare of the general population.

The predominance of foreign aid in economic development is crucial in the case of LDCs such as Cambodia. Mitra (2013), conducting a co-integration study of Cambodia, found that aid yields long term benefits for the economy, in which a 1 percent rise in ODA causes GDP to increase by 0.32 percent. The paper uses different variables (GDP, ODA, Domestic Investment, and Trade Openness), and a dataset from 1971 until 2009 acquired from the UNCTAD database. The methods of his study are expanded in this paper with a newer dataset, and variables focusing on inflation and government expenditures.

Nevertheless, very few empirical studies on aid has been conducted on Cambodia, it is justified that foreign aid plays a crucial role in filling the resource gaps, including investments and savings (fiscal and foreign exchange) gaps. The acquisition of external financing is perceived as the enabler of economic growth. It needs the foreign capital to finance public expenditure and investments, as well as achieving the national strategic development goals and its initiatives.

Research Methodology

Research Design

To establish the long run and short run relationships between endogenous variables, the multivariate co-integration technique, and the vector error correction model (VECM) are used in this study through calculations made within the EVIEWS 7.0 Software. This approach is widely used by econometricians in recent studies (Mallik, 2008; Tadesse, 2011; Hamid, 2013; and Mitra, 2013). Unlike using the predicted linear approximation to determine unknown parameters based on the OLS regression technique, VECM is much more efficient in studying the detail of the long run and short run relationships.

In this research design, following are the procedures: we first test for unit roots in variables by Augmented Dickey-Fuller (ADF) test. Secondly, we estimate the unrestricted

VAR model to select for optimum lags. Thirdly, by running the Johansen's co-integration test, we detect the existence of co-integrating vectors or maximum ranks that determine long term co-integration among variables. Fourthly, we impose restrictions in the VAR model and estimate the VECM, to obtain the long run and short run dynamics of variables. Fifthly, we conduct additional tests such as Impulse Response Function (IRF), and Variance Decomposition (FEVD) to support the existing results and to do forecasting. Lastly, we run the model diagnostics of autocorrelation, normality, heteroskedascity, and system stability tests to check the robustness of the model and confirm the results. Thus, the details and procedures of these methods are explained below.

Data Source

This research uses annual time series data for the period of 1991–2012. The variables are the net total gross domestic product (GDP) as measure of economic growth, official development assistance (ODA) as net aid received, consumer price index (CPI) as price level change and inflation, and government consumption expenditure (GCE) as measure of government spending, and their log forms are lnGDP, lnODA, lnCPI, and lnGCE respectively. The data has been retrieved from the World Development Indicator (WDI) of World Bank Database (2014), and the World Economic Outlook (2014) of the International Monetary Fund Database.

Empirical Results and Analysis

Unit Root Test

The ADF with constant revealed all the variables with unit roots, non-stationary at level, except lnCPI. However, when converted into first difference, the variables were stationary at I(1), integrated at order one. ADF with constant and trend revealed a slightly problematic result of non-stationary at I(1) with lnCPI. Yet, ADF with none presented good results with all variables integrated at the same order of 1.

Table 1: ADF Unit Root Test Results

Variables	ADF Constant		ADF with Trend		ADF none	
	Level	**1st Difference**	**Level**	**1st Difference**	**Level**	**1st Difference**
lnGDP	*0.394*	***-3.748*	*-1.101*	***-3.935*	*5.532*	***-2.277*
lnGCE	*-0.528*	****6.759*	*-2.115*	****-7.109*	*1.649*	****-6.013*
lnCPI	****-6.028*	***-3.134*	****-6.570*	*-2.980*	*2.122*	****-3.114*
lnODA	*0.268*	****-7.880*	****-8.618*	****-7.571*	*3.503*	****-4.923*

*** implies that the coefficient is significant at 1% probability level

** implies that the coefficient is significant at 5% probability level

* implies that the coefficient is significant at 10% probability level

Based on results in table 1, the results imply that the variables in the model are all integrated of the same order I (1), except for the ADF with trend, which means we can proceed to the Johansen's co integration.

Lag Selection

Since this study uses a small sample, with annual long data, so selecting more lags would reduce the degrees of freedom. Johansen and Juselius (1990) theory suggests that for small samples the optimum lag should be limited to 1 or 2 for the efficient results. The selection of the lag length in the VAR is provided by the residue tests (LR, FPE, AIC, SC, HQ). The optimum lags selected for this model are 1 and 2 in both the scenarios. Yet, lag 1 yielded efficient result in terms of statistical significance in the vector equations, and the VECM estimates.

Johansen Co-integration Test

Table 2: Johansen Co-integration Test Results

H_0 (Null Hyp.)	H_a (Alt Hyp.)	Eigen Value	Trace Statistic	5% Critical Value	Max-Eigen Statistic	5% Critical Value
r = 0	r = 1	0.961900	102.0827	47.85613*	65.35083	27.58434*
r ≤ 1	r = 2	0.733630	36.73184	29.79707*	26.45739	21.13162*
r ≤ 2	r = 3	0.401466	10.27444	15.49471	10.26542	14.26460
r ≤ 3	r = 4	0.000451	0.009019	3.841466	0.009019	3.841466

Trace test indicates 2 co-integrating eqn(s) at the 0.05 level; Max-eigenvalue test indicates 2 co-integrating eqn(s) at the 0.05 level; * denotes rejection of the hypothesis at the 0.05 level.

The results for both the Trace statistic and the Maximum Eigen statistic reported in the table 2 revealed a maximum rank of 2 for the scenarios selected at the 5% significance level; the Johansen co-integration test has identified two co-integrating vectors or ranks, hence two ranks are applied to establish the vector error correction model (VECM). Thus, we can conclude that the variables in this model have two long run co-integrating relationships.

Vector Error Correction Model (VECM)

The VECM equation is specified with two ranks identified by the Johansen Test and with the selection of one lag based on the AIC and SC criteria; therefore, the VECM equation of this model is illustrated: $\Delta y_t = A_0 + A_1 \Delta y_{t-1} + a.(\beta' y_{t-1}) + \varepsilon_t$

$$\begin{bmatrix} \Delta lnGDP_t \\ \Delta lnGCE_t \\ \Delta lnCPI_t \\ \Delta lnODA_t \end{bmatrix} =$$

$$A_0 + A_1 \cdot \begin{bmatrix} \Delta lnGDP_{t-1} \\ \Delta lnGCE_{t-1} \\ \Delta lnCPI_{t-1} \\ \Delta lnODA_{t-1} \end{bmatrix} + \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \\ a_{31} & a_{32} \\ a_{41} & a_{42} \end{bmatrix} \cdot \begin{bmatrix} \beta_{11} & \beta_{21} & \beta_{31} & \beta_{41} \\ \beta_{12} & \beta_{22} & \beta_{32} & \beta_{42} \end{bmatrix} \cdot \begin{bmatrix} \Delta lnGDP_{t-1} \\ \Delta lnGCE_{t-1} \\ \Delta lnCPI_{t-1} \\ \Delta lnODA_{t-1} \end{bmatrix} + \begin{bmatrix} u_{1,t} \\ u_{2,t} \\ u_{3,t} \\ u_{4,t} \end{bmatrix}$$

Where ln demotes natural logarithmic sign, Δ is the difference operator, A_0 is the constant, A_1 are the coefficients of the stationary I(1) endogenous variables, the optimal lag length is 1 in this equation, ε_t is the error correction terms and a and β' are coefficients.

The β matrix parameters are calculated based on Eviews 7.0, it then automatically imposed restrictions on the following vectors:

Unrestricted co-integrating vectors

$$\beta = \begin{matrix} Vector\ 1 \\ Vector\ 2 \end{matrix} = \begin{bmatrix} -5.529 & 0.229 & 5.970 & 3.964 \\ -9.038 & 7.275 & 5.298 & -4.113 \end{bmatrix}$$

Restrictions imposed on co-integrating vectors;

Vector 1: $\beta_{11} = 1, \beta_{21} = 0$

Vector 2: $\beta_{12} = 0, \beta_{22} = 1$

The reason why we impose restrictions on the variables is because we want to normalize the beta coefficients, so we obtain its economic meaning (long run estimates), in this case we observe the impact of foreign aid on GDP and GCE. More importantly, it does not mean that GCE has no impact on GDP but it is not explained by this model. The importance of Johansen's normalization restrictions is incorporated in various studies using co-integration and VECM (Mallik, 2008; and Tadesse, 2011).

VECM Long Run Estimates

Since the optimum lag length selected is 1, and the Johansen's co-integrating test shows two co-integrating vectors. One lag is used, and two restrictions are placed on GDP and GCE, therefore, only CPI and ODA are estimated for the GDP and GCE equation. The coefficients are represented below in the long run equation CE1 and CE2; therefore, the relationship between CPI, ODA on GDP and on GCE for Cambodia are justified as:

$$\ln(GDP) = -1.877 + 1.107\ln(CPI) + 0.781\ln(ODA) \qquad (CE1)$$

$$\ln(GCE) = 14.069 + 0.6467\ln(CPI) + 1.535\ln(ODA) \qquad (CE2)$$

For the co-integrating equation 1 (CE1), the long run effect of foreign aid (ODA) and inflation (CPI) on economic growth (GDP) in Cambodia is positive and statistically significant at 1% level. This also means that a 1 unit increase in ODA would cause a 0.78 unit increase in GDP for a year term; this confirms that ODA has been effective in stimulating growth in Cambodia. While, a 1 unit increase in CPI would cause a 1.11 units increase in GDP. The inflation rate is an important macroeconomic indicator to look out for, its impact will determine growth or inhibit growth; for Cambodia's case, inflation seems to be well maintained, therefore, a positive long run impact on GDP is shown.

Despite the controversy of the economics theories and literature on the foreign aid, the empirical result of this study through this model has proven that foreign aid has been effective for the past 22 years in Cambodia. It has greatly contributed in stimulating

economic growth, and this model has also shown that foreign aid has a very strong and positive long run impact on economic growth in Cambodia. This finding is in line with Mitra's (2013) findings and validates the theory of various pro-aid economists such as the famous two-gap model (aid fills the investment and savings gap thus achieving growth) introduced by Cherney and Strout (1966), and the poverty trap model (large sums of aid would significantly promote growth) discussed by Sachs, et al. (2004), as well as important findings from Burnside and Dollar (2004), and Camelia & Sanjay (2009).

VECM Short Run Estimates

VECM results also capture the error correction term and short run coefficients of Γ. The error correction term is Πy_{t-k}, where the beta and alpha matrix are presented below, CE1 and CE2 below indicate the speed of adjustment of the model towards the long term equilibrium in the case of shocks.

Table 3: Analysis

Error Correction	ΔLOGGDP	ΔLOGGCE	ΔLOGCPI	ΔLOGODA
CE1	0.225938	0.298974	0.620182***	-0.002041
CE2	-0.229601*	-0.636009**	-0.141429*	0.250467
ΔLOGGDP-1	-0.393774	-0.547632	-0.536203***	0.613310
ΔLOGGCE-1	0.209073*	0.200453	0.171784*	0.229488
ΔLOGCPI-1	0.060597	0.760054*	-0.051859	0.092051
ΔLOGODA-1	0.025450	-0.187032	0.133049**	-0.273520
Constant	0.094729	0.033658	0.117399	0.010413

***, **, * implies that the coefficient is significant at 1%, 5%, and 10% probability level respectively.

According to the results above, the value of R^2 showed that about 29% of the variations in GDP are explained by set of explanatory variables used in this model, this result is acceptable as there are many other economic factors that contribute to GDP such as investments, exports, and industries, etc. The VECM short run estimates are mostly insignificant, except for government consumption expenditure (GCE), which has a positive short run relationship on GDP and is statistically significant at 10%. Whereas, the short run

relationship of inflation (CPI) and foreign aid (ODA) on economic growth (GDP) is positive, but is statistically insignificant. Another significant finding is that all GDP, GCE, and ODA have a significant relationship with price levels (CPI), and hence causes inflation.

Additional information includes, GCE causes GDP. Where, government consumption expenditure accounts for the gross domestic product in line with the GDP theory. CPI causes GCE, where the increase of price levels also increases government consumption expenditure.

The error correction terms (ECT) of the co-integration equations (CE) report the speed of adjustment towards the long run equilibrium; they are supposed to have negative and significant coefficients. However, CE1 does not appear to have the correct signs; therefore, any deviation of these models in the short run is not adjusted towards the long run equilibrium. On the other hand, CE2 indicates that the adjustment to the long run is taking place in this model; however, we are only interested in the results of CE1, as GDP is the dependent variable.

According to the results, the short run dynamics did not reveal much on ODA. But, it can be concluded that foreign aid (ODA) has a positive short run relationship with GDP, but is statistically insignificant in this model. It also has a positive relationship with CPI and is statistically significant. By theoretical interpretation, this means that in this model, it supports the hypothesis that foreign aid stimulates economic growth in Cambodia in the short run, but the estimates are insignificant. More importantly, the inflows of foreign aid have a strong relationship with inflation and it can cause price levels to increase in Cambodia.

Model Diagnostics

In summary, all tests of the diagnostics revealed that the model is stable and has no signs of autocorrelation, normality, or heteroskedasticity problems. Therefore, the model is well designed and does not suffer from any econometric problems. *The stability condition test* of the Inverse roots of AR polynomial shows that none of the points lies outside the circle,

suggesting that the VECM model is stable and the results obtained are valid. *The serial correlation test* results suggest that there is no evidence of serial correlation amongst residuals as shown by the probability values. The null hypothesis of no serial correlation is accepted at 5% percent level of significance. *The residual normality test* reveals that residuals are multivariate normal, meaning that all data are normally distributed. The *heteroskedasticity test* shows that there were no heteroskedasticity in the model.

Conclusion and Recommendations

The empirical results of this study, therefore, conclude that foreign aid has a positive long run impact on economic growth in Cambodia. The results of this study are quite similar to Mitra's (2013) findings in which author stated that *every 1 percent increase in foreign aid causes GDP to rise by 0.32 percent.* Based on Tadesse's (2011) cointegration approach for Ethiopia, this study also found similar results that foreign aid has a positive impact on economic growth in the long run, but the short run effect is insignificant. The insignificance of the short run estimates could be due to lags and how longer Cambodia takes to absorb the benefits of aid.

Further evidence also shows that foreign aid may cause inflation to rise; this is in line with the theory that high inflows of injected capital will cause inflation. Therefore, it is important to take into consideration the careful monitoring of fund management. Additionally, foreign aid and inflation have a positive impact on government expenditure in the long run; this finding is in fact valid, as price levels increase, it would increase government purchases or expenditures, and as foreign aid increases, the government tend to consume or invest more on its projects and initiatives.

Throughout the years, Cambodia has been doing its best to overcome the challenges and issues that it has. What is found, based on this study, is that foreign aid does have a positive impact on the economy, and it is recommended that donors must continue providing

aid. More importantly, based on OECD statistics, Cambodia is making efforts to gradually reduce its dependency on aid from the most of the OECD donor countries, but China still remains a major contributor of foreign aid. Currently, the country is still largely dependent on aid and as shown in this study, foreign aid can affect inflation, so it is recommended that aid must be handled with maximum efficiency to avoid price instability. It is also recommended that Cambodia should gradually rely on its own resources to achieve efficient development and maximum utilization of the country's resources.

Foreign aid has been a positive contributor towards the growth of the economy, as GDP soared over US$15 billion and poverty rates dropped under the 20% line in 2013. Based on theoretical framework, Sachs, et al. (2004) theory of the poverty model seems valid. He suggests that aid would help stimulate the economy and by providing enough capital, it would automatically help boost people get out of poverty. Therefore, for Cambodia's case, foreign aid is proven to be effective by this model. Furthermore, this study can be expanded on to improve and validate by including many other important variables such as the corruption index, policy index, human development index, exports, trade openness and policies, as recommended by Burnside & Dollar (2000).

Although, this study yielded positive results, there are still limitations that must be considered for further improvements. The data utilized in this study was set only within the framework of the World Bank's database and only yearly observations were available for analysis; it is recommended that the quarterly data for ODA and GCE to be made available, so that further studies would produce much more efficient results.

References

ADB (2013). Outlook 2013 Update, Asian Development Bank Report.

Bauer, P. T. (1972). Dissent on Development, Cambridge: *Harvard University Press.*

Boone, P. (1996). Politics and the Effectiveness of Foreign Aid, *European Economic Review*, 40:289-329.

Burnside, C. & Dollar, D. (1997). Aid, Policies, and Growth, *World Bank Policy Research Paper* No. 1777, World Bank, Washington DC.

Burnside, C. & Dollar, D. (2000). Aid, Policies, and Growth, *American Economic Review,* 90(4): 847-868

Burnside, C. & Dollar, D. (2004). Aid, Policies, and Growth: Revisiting the Evidence, *World Bank Policy Research Paper* No. 0-2834, World Bank, Washington DC.

Camelia, M. & Sanjay, G.R. (2009). Development Aid and Economic Growth: A Positive Long Run Relation. *International Monetary Fund Working Paper* WP/09/118.

Chenery, H. B. & Strout, A. M. (1966). Foreign Assistance and Economic Development, *American Economic Review.* 56: 679-733.

Dalgaard, C., Hansen, H. & Tarp, F. (2004). On the Empirics of Foreign Aid and Growth, *The Economic Journal*, 114(496): 191-216.

Easterly, W. (2003). Can Foreign Aid Buy Growth? *The Journal of the Economic Perspectives,* 17(3): 23-48.

Ekanayake, E. M., & Chatrna, D. (2010). The Effect of Foreign Aid on Economic Growth in Developing Countries, *Journal of International Business and Cultural Studies*, 3: 1-13.

Fasanya, I. O. & Onakoya A.B.O. (2012). Does Foreign Aid Accelerate Economic Growth? An Empirical Analysis For Nigeria. *International Journal of Economics and Financial Issues,* 2(4):423-431.

Griffin, K. & Enos, J. (1970). Foreign Assistance: Objectives and Consequences, *Economic Development and Cultural Change,* 18: 313-327.

Hamid, H.A.E.A. (2013). Foreign Aid and Economic Growth in Egypt: A Cointegration Analysis, *International Journal of Economic and Financial Issues*. 3(3):743-751.

Hansen, H. & Tarp, F. (2001). Aid and Growth Regressions, *Journal of Development Economics,* 64(2): 547-570.

Harms, P. & Lutz, M. (2004). The Macroeconomic Effects of Foreign Aid: A Survey, *Discussion Paper* no. 2004-11, Department of Economics, University of St. Gallen.

International Monetary Fund. (2013). Cambodia and the IMF, *Country Report* No. 14/33.

International Monetary Fund, (2014). World Economic Outlook April 2014, available at: http://www.imf.org/external/pubs/ft/weo/2014/01/weodata/index.aspx (Retrieved on 20/09/2014.

Johansen, S. (1988). Statistical Analysis of Co-integration Vectors, *Journal of Economic Dynamics and Control*, 12(2-3): 231-254.

Johansen, S. & Juselius, D. (1990), Maximum Likelihood Estimation and Inference on Co integration with Applications to the Demand for Money, Oxford Bulletin of Economics and Statistics, 52(2):169-210.

Kurihara, Y. (2014). Does Foreign Aid Promote Economic Growth? *Global Business and Economic Research Journal,* 3(4):20-30.

Lensink, R. & White, H. (2001). Are There Negative Returns to Aid? *Journal of Development Studies*, 37(6):42-65.

Mallik, G. (2008). Foreign Aid and Economic Growth: A Cointegration Analysis of the Six Poorest African Countries. *Economic Analysis and Policy*, 38(2): 251-260.

Mcmillan, L. (2011). Foreign Aid and Economic Development, *School of Doctoral Studies (European Union) Journal*, 158-165.

Mitra, R. (2013). Foreign Aid and Economic Growth: A Cointegration Test for Cambodia, *Journal of Economics and Behavioural Studies,* 5(2): 117-121.

Moreira, S. B. (2005). Evaluating the Impact of Foreign Aid on Economic Growth: A Cross Country Study, *Journal of Economic Development,* 30(2): 25-49.

Nelson, R. R. (1956). A Theory of the Low-Level Equilibrium Trap in Underdeveloped E0conomies. *The American Economic Review*, 46(5): 894-908.

Royal Government of Cambodia. (2013). Rectangular Strategy for Growth, Employment, Equity and Efficiency Phase III, Fifth Legislature of the National Assembly.

Sachs, J. D., McArthur, J. W., Schmidt-Traub, G., Kruk, M., Bahadur, C., Faye, M., & McCord, G. (2004). Ending Africa's Poverty Trap, *Brookings Papers on Economic Activity*, vol. 1: 117-240.

Sophal, E. (2012). Aid Dependence in Cambodia: How Foreign Assistance Undermines Democracy, Columbia University Press.

Tadesse, T. (2011). Foreign Aid and Economic Growth in Ethiopia: A Co-integration Analysis, *The Economic Research Guardian.* 1(2): 88-108.