Does Foreign Aid Cause "Dutch Disease"?: Case of Cambodia, Lao PDR, Myanmar and Vietnam

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Abstract: This paper examined the economic impacts of foreign aid from the Dutch-Disease perspective, focusing on the economies of Cambodia, Lao PDR, Myanmar and Vietnam (so-called CLMV). The CLMV were targeted in this study since they have rarely been studied in the literature in this field although their economies have still depended highly on foreign aid. We found no evidence that they have suffered from the Dutch Disease, or rather identified a positive production effect of foreign aid. We speculate that the major use of foreign aid in the CLMV has focused on economic infrastructure, which has given little room for raising consumption and contributed directly to capital accumulation there.

Keyword: Foreign Aid, Dutch Disease, CLMV, ODA, Tradables and Non-Tradables, Capital Accumulation.

1. INTRODUCTION

The International Community has been providing development assistance for a long time to developing countries, in particular, "Least Developed Countries" (LDC) classified by the United Nations (UN).[1] The United Nations Conference on the LDC, however, emphasized that more than 75 per cent of the LDC population still lived in poverty, and only three countries have graduated out of this category so far in the past three decades.[2] The effectiveness of development assistance, therefore, has been a matter of deep concern not only for a purely academic viewpoint, but also for policy purposes.

There have been intensive debates and studies on the impact of foreign aid on economic growth, theoretically and empirically. From the theoretical perspective, as Tekin (2012) summarized, standard economic theory suggests a positive relation between foreign aid and economic growth, by arguing that the aid contributes to capital accumulation, thereby enhancing economic growth for the recipient economies; the counter argument tells us that the aid is negatively related to economic growth since the aid crowds out domestic savings by accelerating consumption. This summary roughly corresponds to a traditional argument by e.g. Griffin (1970): whether foreign aid supplements domestic savings or consumption. Empirics on this issue have also provided mixed evidence, i.e., the evidence in favor of the argument that aid facilitates economic growth unconditionally or in certain conditions (Burnside and Dollar, 2000; Hansen and Tarp, 2001; Dalgaard, *et al*., 2004; Asteriou, 2009; Minoiu and Reddy, 2010), and that aid is growth-neutral (Boone, 1996; Easterly, 2005; Burke and Ahmadi-Esfahani, 2006) or even growth-deteriorating (Gong and Zou, 2001; Bobba and Powell, 2007; Kourtellosa, *et al*. 2007).

The relationship between foreign aid and economic growth could also be discussed by another theoretical angle, i.e., the adaptability of "Dutch Disease" hypothesis. The Salter-Swan-Corden-Dornbusch model presented by Corden and Neary (1982) demonstrates the Dutch Disease effects of "capital inflows" in small open economies: capital inflows, through raising higher disposal income and aggregate demand, trigger higher relative prices of non-tradable goods (spending effect) that corresponds to a real exchange rate appreciation, which causes further movement of resources toward nontrade sector away from tradable sector (resource movement effect). In the longer-term, however, as Bourdet and Falck (2006) argued, an increase in capital inflows boosts capital accumulation through their effects on domestic saving and investment, thereby resulting in the expansion of the production of both tradables and non-tradables.

This Dutch Disease theory could be applied to examine the economic impacts of foreign aid, since the foreign aid constitutes one of the major elements as an origin of capital inflows. There have been, however, very few empirical studies that intend to verify the Dutch Disease hypothesis in the context of

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[1]See UNCTAD website: http://unctad.org/en/Pages/ALDC/Least%20Developed%20Countries/UN-list-of-Least-Developed-Countries.aspx

[2]See UNCTAD (2011).

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investigating the effectiveness of foreign aid. Rajan and Subramanian (2011) examined the effects of aid on the growth of manufacturing with the samples of 32 countries for the 1980s and of 15 countries for the 1990s, and with the samples of 28 manufacturing industries in these countries, and presented the evidence to support the existence of Dutch Disease: aid inflows have systematic adverse effects on a country's competitiveness, as reflected in the lower relative growth rate of exportable industries. On the other hand, Adam (2006) focused on the supply-side impact of aid-financed public expenditure rather than short-run Dutch Disease effects, and represented the model and its simulation outcome in which public infrastructure generates an intertemporal productivity spillover effect. Focusing on African developing economies, Fielding and Gibson (2012), targeting twenty-six Sub-Saharan African countries, showed a variety of macroeconomic responses from aid inflows, which could be explained by variation in observable country characteristics. Tekin (2012) also examined the case of African LDC and revealed negative impacts of foreign aid on international trade and economic growth with the potential reason of Dutch Disease.

This paper examines the economic impacts of foreign aid from the Dutch-Disease perspective, focusing on the economies of Cambodia, Lao PDR, Myanmar and Vietnam (so-called CLMV). The reasons why the CLMV economies are targeted in this paper are as follows. First, the CLMV economies show a high presence as the recipients of foreign aid, i.e., Official Development Assistance (ODA) in Asia. Table **1** indicates that Asia occupies one-third in the amount of net ODA receipts, and that the CLMV occupies more than ten percent in their amount within Asia. Thus, the CLMV would be a major recipient in Asia except for central, southern and middle-east Asian countries. At the same time, the CLMV depends highly on ODA by 2 - 5 percent of their Gross National Income (GNI), since the CLMV economies are the latecomers in Association of Southeast Asian Nations (ASEAN), and, in particular, Cambodia, Lao PDR and Myanmar still belong to LDC in the UN classification. Second, to our knowledge, there seem to be no studies to deal explicitly with the CLMV, the latecomers in ASEAN, as research targets for foreign-aid assessment. In the above-mentioned literature, Asteriou (2009) and Burke and Ahmadi-Esfahani (2006) were targeting Asian economies in their analyses, but they did not contain the CLMV as their estimation samples. As for the literature on the Dutch Disease application to the analyses of aid assessment, most of the studies focus on African developing economies as their research targets.

The rest of the paper is structured as follows. Section 2 will describe the theoretical framework of Dutch Disease hypothesis, i.e., the Salter-Swan-Corden-Dornbusch model for its application to aid-effectiveness analysis. Section 3 represents empirics for aid assessment under the Dutch Disease framework: data for key variables, methodologies for a vector auto-regression (VAR) estimation, and the estimation outcomes with its interpretation. The last section summarizes and concludes.

2. THEORETICAL FRAMEWORK

This section describes the theoretical framework of Dutch Disease hypothesis for its application to aid-effectiveness analysis. The framework is, in brief, composed of "spending effect" and "resource movement effect" in the short-term, and capital accumulation effect in the longer-term. The following description is based mainly on Bourdet and Falck (2006).

In Figure **1**, Non-tradables are indicated along with the horizontal axis and tradables along the vertical axis. The initial transformation curve between tradables and non-tradables is given by curve P-P. The initial equilibrium is given by point A, where the transformation curve is tangential to the social indifference curve (not drawn) and the slope of the curves, i.e., the relative prices of non-tradables to tradables, is determined.

The capital inflows (foreign aid in this case) shown at point F make the transformation curve shift upwards to P-PF, since the supply of non-tradables is limited and the availability of tradables increases with higher disposal income. With unchanged prices of non-tradables shown at point A', there would be excess demand for non-tradables, assuming their positive income elasticity. Thus, the prices of non-tradables have to rise to clear the market, and since the prices of tradables are determined in the world market, the relative prices of non-tradables to tradables also rise, which corresponds to an appreciation of real exchange rate (spending effect). Then, the hike of relative prices, by encouraging a move of mobile production factors from the tradable sector to the non-tradable sector, causes an increase in the production of non-tradables and a decrease in that of tradables with point A' moving to point B (resource movement effect).

Table 1: Position of CLMV on ODA Receipts

Official Development Assistance (ODA) for Developing Countries in 2014		
Country Group	**Net ODA Receipts (USD million)**	**% of Total**
TOTAL	161,075	100.0
AFRICA	54,193	33.6
AMERICA	9,949	6.2
ASIA	53,785	33.4
EUROPE	8,613	5.3
OCEANIA	1,863	1.2
Unspecified	32,672	20.3

Major Recipients of ODA in Asia in 2014			
Country	**ODA/GNI %**	**ODA (USD million)**	**% of ASIA**
Afghanistan	23.0	4,823	9.0
Kyrgyzstan	8.7	624	1.2
Jordan	7.6	2,699	5.0
Bhutan	7.4	130	0.2
Timor-Leste	6.4	247	0.5
Cambodia	5.0	799	1.5
Nepal	4.4	880	1.6
Lao People's Democratic Republic	4.2	472	0.9
Tajikistan	3.9	356	0.7
Georgia	3.4	563	1.0
Mongolia	2.8	315	0.6
Viet Nam	2.4	4,218	7.8
Armenia	2.3	265	0.5
Myanmar	2.2	1,380	2.6
Lebanon	1.8	820	1.5
Pakistan	1.4	3,612	6.7
Bangladesh	1.3	2,418	4.5

Source: Author´s elaboration using Statistics on Resource Flows to Developing Countries, OECD.
http://www.oecd.org/dac/stats/statisticsonresourceflowstodevelopingcountries.htm

In the longer-term, however, all production factors adapt to the changed conditions so that the transformation curve can shift towards P'-P' with a bias to the production of non-tradables. Considering also the role of capital accumulation, the curve would shift further outwards. As a consequence, the relative prices of non-tradables could be expected to fall with point B moving further to point C.

To sum up, in the short-term, foreign aid would deteriorate the production of tradables through real exchange rate appreciation under Dutch Disease. In the longer-term, however, foreign aid would result in the expansion of the production of both tradables and non-tradables because of capital mobility and accumulation. In short, foreign aid is not friendly with economic growth under Dutch Disease, but compatible with economic growth in the longer-term.

3. EMPIRICS

This section represents empirics for aid assessment under the Dutch Disease framework: data for key variables, methodologies for a VAR model estimation, and the estimation outcomes with its interpretation.

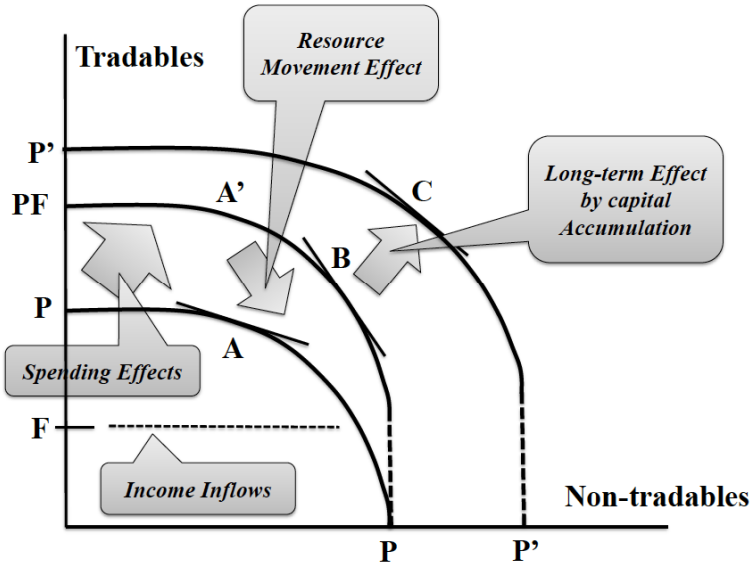


Figure 1: Theoretical Framework for "Dutch Disease".

Note: This diagram is based on Bourdet and Falck (2006).

3.1. Data for Key Variables

At the beginning, we identify economic variables for our VAR model estimation. Since the purpose of analysis is to examine the impact of foreign aid on economic growth under the Dutch Disease framework for the CLMV economies, we pick up three endogenous variables: net ODA receipts in real term (*odar*), GDP in real term (*gdpr*), and the ratio of manufacturing relative to services in GDP base (*mosr*), and one control variable: inward foreign direct investment (FDI) in real term (*fdir*). The reason why we focus only on limited number of variables is to maximize the degree of freedom in the estimation within the range of annual data from 1970 to 2013.

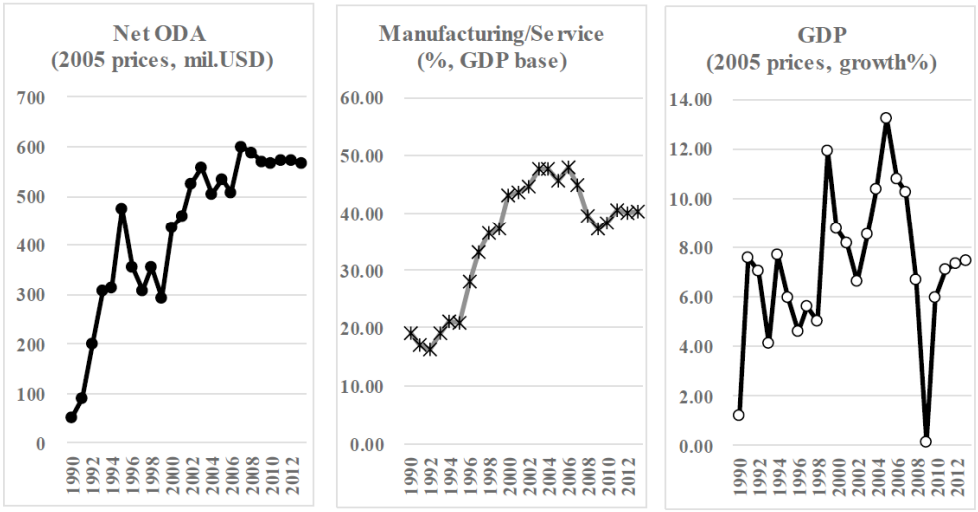
The "net ODA receipts (*odar*)" are a variable of foreign aid received by the CLMV. The nominal data in terms of current US dollars are retrieved from World Development Indicators (WDI) of the World Bank.[3] They are, then, processed in real term (2005 prices) by being deflated in GDP deflator. The GDP deflator is calculated implicitly by dividing "GDP in US dollars at current prices and current exchange rates" by "GDP in US dollars at constant prices (2005) and constant exchange rates (2005)", both of which are retrieved from UNCTAD STAT.[4] The "GDP in real term (*gdpr*)" is also "GDP in US dollars at constant prices (2005) and constant exchange rates (2005)" from UNCTAD STAT. "The ratio of manufacturing relative to services in GDP base (*mosr*)" is derived by dividing "manufacturing in value-added term" by "services in value-added one", both of which are retrieved from UNCTAD STAT. The ratio is a variable for testifying the Dutch Disease hypothesis, as was also utilized for the Dutch Disease test for the case of international migrant remittances in Lartey *et al*. (2012). The manufacturing sector is a proxy of tradables, while the service sector is that of non-tradables. The Dutch Disease would be implied, if the ratio declined with an increase in ODA receipts. The "inward FDI (*fdir*)", whose data is from UNCTAD STAT, is also expressed in real term by being deflated in GDP deflator just like the "net ODA receipts in real term". The reason why we adopt a variable *fdir* as an exogenous variable is to control the effects of inward FDI on manufacturing-services ratio and GDP growth, and to extract pure effects of ODA receipts on them. The FDI might also cause the Dutch Disease as one of the components of capital inflows as we described in Section 2.

Figure **2** displays the overviews of three key variables: net ODA receipts in real term, manufacturing-services Development Assistance Committee ratio, and real GDP growth for the CLMV economies. The Figure confines the sample data to 1990-2013 since the sample before 1990 include highly volatile data for CLMV economies. We could roughly observe them as follows. First, the net ODA receipts show increasing trends although there have been some recent declines in Lao PDR. Second, the

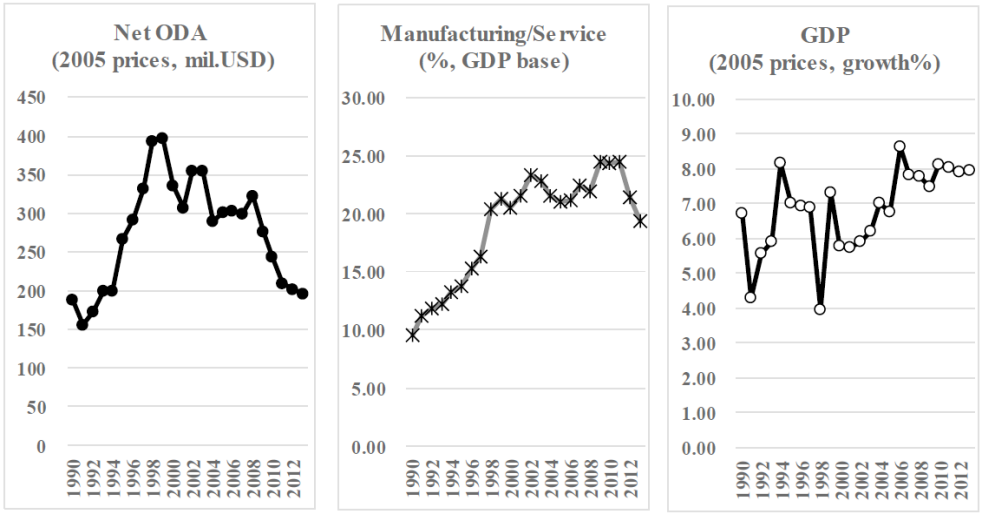
[3]See the website: http://data.worldbank.org/indicator/DT.ODA.ODAT.CD

[4]See the website: http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx

[Cambodia]



[Lao PDR]



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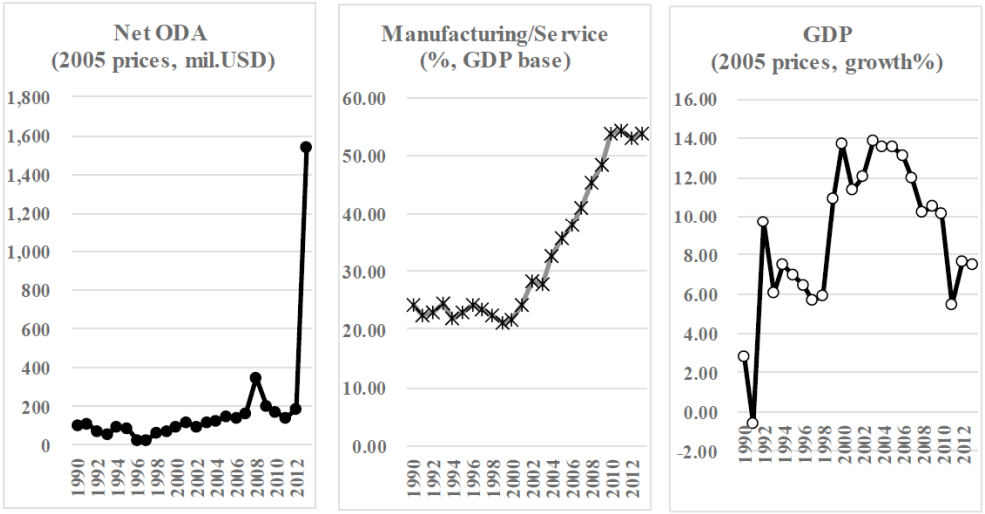

(Figure 2). Continued.

[Vietnam]

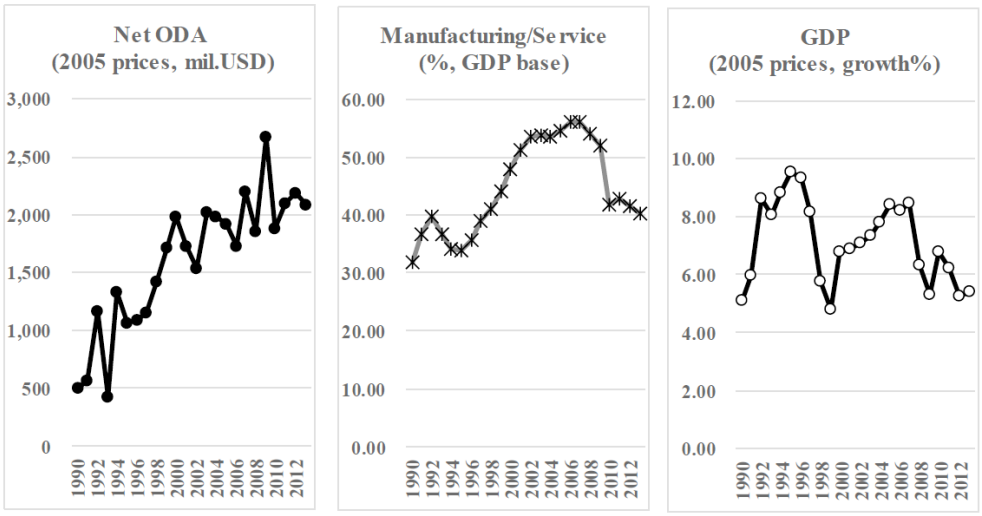

Figure 2: Overviews on CLMV Economies in 1990-2013.

Source: Author´s elaboration using World Development Indicator (World Bank) and UNCTAD Stat.

http://data.worldbank.org/indicator/DT.ODA.ALLD.CD

http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS_ChosenLang=en

Manufacturing-services ratio also indicates growing trends, thereby implying non-existence of the Dutch Disease. Third, the real GDP keeps high growth by around 7 percent on average for the 1990s, thereby implying some positive relationships between the net ODA receipts and real GDP.

These rough observations should be statistically tested by a VAR model estimation in the following sub-section 3.2. For the VAR estimation, we will convert all the data into natural logarithm form, and then construct a panel data with the four CLMV economies for the period from 1970 to 2013.

3.2. Methodologies for a VAR Model Estimation

We herein conduct a VAR model estimation. The reason why we adopt a VAR model for our aid-effectiveness analysis is that the VAR model allows for potential and highly-likely endogeneity between the variables of interest, and also for tracing out the dynamic responses of variables to exogenous shocks overtime.

Before specifying a VAR model, we investigate the stationary property of the constructed panel data by employing a unit root test. We herein adopt the Levin, Lin and Chu (LLC) test developed by Levin *et al*. (2002), since the test assumes that the parameters of the series lagged are common across cross-sections. The test is conducted on the null hypothesis that a level and/or a first difference of panel data have a unit root, by including "intercept" and "trend and intercept" in the test equation. Table **2** reports that, for a first difference of panel data, the null hypothesis of a unit root is rejected at 99 percent significant level in all four variables on any test equations. We thus use the first difference series of panel data for a VAR model estimation.

We now specify a VAR model for estimation in the following way.

$$y_t = \mu + V_1 y_{t-1} + V_2 z_t + \varepsilon_t \quad (1)$$

where y_t is a (3×1) column vector of the endogenous variables: $y_t = (d(aidr)_t\, d(mosr)_t\, d(gdpr)_t)'$, z_t is a (3×1) vector of the control variable of $d(fdir)_t$, μ is a (3×1) constant vector, each of V_1 and V_2 is a (3×3) coefficient matrix, y_{t-1} is a (3×1) vector of the lagged endogenous variables, and ε_t is a (3×1) vector of the random error terms in the system. The lag length (-1) is selected by the minimum Akaike Information Criterion (AIC) with maximum lag equal to (-2) under the limited number of observations.

Based on the VAR model (1), we examine the bilateral Granger causalities among the endogenous variables: $d(aidr), d(mosr)$ and $d(gdpr)$, and also

Table 2: LLC Unit Root Test for Variables for CLMV Economies

	level		first difference	
	intercept	trend & intercept	intercept	trend & intercept
odar	-1.22	-2.39***	-5.95***	-4.94***
mosr	0.79	0.61	-7.96***	-7.26***
gdpr	3.43	-2.57***	-3.56***	-3.56***
fdir	0.37	-0.76	-5.99***	-4.95***

Note: ***, **, * denote rejection of null hypothesis at the 99%, 95% and 90% level of significance, respectively.
Sources: Author´s elaboration using World Development Indicator (World Bank) and UNCTAD Stat.
http://data.worldbank.org/indicator/DT.ODA.ALLD.CD
http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS_ChosenLang=en

investigate the impulse responses to the one-standard-deviation shock from net ODA receipts, $d(aidr)$ so that we can trace the 8-year dynamic effects in accumulated terms. Regarding the Granger causality, Granger (1969) approached to the question of whether X causes Y by showing how much of the current Y can be explained by past values of X and then by seeing whether or not adding lagged values of X can improve the explanation of Y. Y is said to be Granger-caused by X if X helps in the prediction of Y, or equivalently if the coefficients for the lagged X's are statistically significant to explain Y.

3.3. Estimation Outcomes and Its Interpretation

Tables **3**, **4** and Figure **3** respectively report estimation outcomes of the VAR model, the bilateral Granger causalities and the impulse responses.

Regarding the bilateral Granger causalities, it is only the causality from net ODA receipts to real GDP that is identified at the conventional significant level of 95 percent, whereas there is no causality from net ODA receipts to manufacturing-services ratio. This outcome suggests that foreign aid does not affect the production ratio of tradables over non-tradables, thereby implying non-existence of the Dutch Disease. The outcome also suggests that foreign aid has a positive longer-term effect on the production of both tradables and non-tradables.

The result of causality test above enables us to focus on the only relationship between net ODA and real GDP in the impulse response analysis. Figure **3** tells us that real GDP positively respond to the shock from net ODA receipts at least within a 90 percent error band, although the response loses its significance at a 95 percent error band with the band being widened after four years. Thus, the impulse response analysis also confirmed the positive dynamic effect of foreign

Table 3: Estimated VAR Model for CLMV Economies

	d(aidr)	***d(mosr)***	***d(gdpr)***
d(aidr) -1	0.209***	0.007	0.009**
	[2.644]	[0.694]	[1.982]
d(mosr) -1	-0.366	0.069	-0.010
	[-0.640]	[0.883]	[-0.301]
d(gdpr) -1	0.914	0.251*	0.605***
	[0.887]	[1.775]	[9.502]
C	-0.020	0.000	0.021***
	[-0.273]	[-0.011]	[4.598]
d(fdir)	0.049	-0.004	0.001
	[1.102]	[-0.769]	[0.516]
adj. R^2	0.027	0.009	0.345

Note: ***, **, * denote rejection of null hypothesis at the 99%, 95% and 90% level of significance, respectively.
Sources: Author´s elaboration using World Development Indicator (World Bank) and UNCTAD Stat.
http://data.worldbank.org/indicator/DT.ODA.ALLD.CD
http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS_ChosenLang=en

Table 4: Pairwise Granger Causality Tests for CLMV Economies

Variables	Lags	Null Hypothesis	F-Statistic
odar & gdpr	*1*	*d(odar)* does not Granger Cause *d(gdpr)*	3.93**
		d(gdpr) does not Granger Cause *d(odar)*	0.51
odar & mosr	*1*	*d(odar)* does not Granger Cause *d(mosr)*	0.18
		d(mosr) does not Granger Cause *d(odar)*	0.35
mosr & gdpr	*1*	*d(mosr)* does not Granger Cause *d(gdpr)*	0.11
		d(gdpr) does not Granger Cause *d(mosr)*	3.02*

Note: ***, **, * denote rejection of null hypothesis at the 99%, 95% and 90% level of significance, respectively.
Sources: Author´s elaboration using World Development Indicator (World Bank) and UNCTAD Stat
http://data.worldbank.org/indicator/DT.ODA.ALLD.CD
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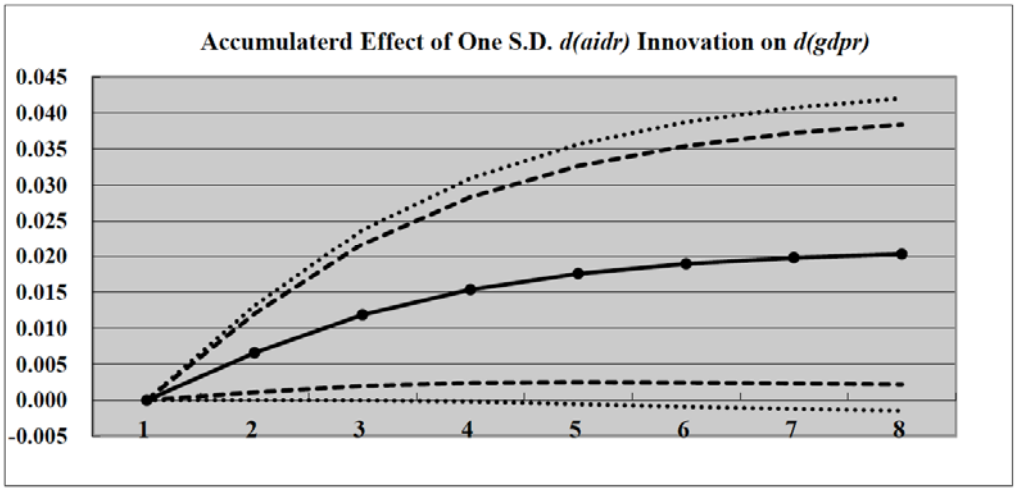

Figure 3: Impulse Response of real GDP to Aid Shock for CLMV Economies.

Note: The coarse and fine dotted lines denote a 90 and 95 percent error band respectively over 8-year horizons.

Sources: Author´s elaboration using World Development Indicator (World Bank) and UNCTAD Stat

http://data.worldbank.org/indicator/DT.ODA.ALLD.CD

http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS_ChosenLang=en

aid on real GDP, i.e., the total production of both tradables and non-tradables.

In sum, the foreign aid received by the CLMV has no Dutch Disease effect, or rather a positive production effect for their economies. We interpret this outcomes in the following way. The positive production effect of foreign aid for the CLMV seems to be related with the characteristics of the ODA provided to Asian area. According to Table **5**, we observe first that Japan as a donor member in Development Assistance Committee (DAC) provides its ODA to developing countries in Asia and Oceania by more than 70 percent, whereas the United States and EU countries give their ODA in Africa and Middle East by 50-60 percent. Japan, thus, concentrates its ODA on Asian area. Second, we find that the major use of Japan's ODA focuses on "Economic Infrastructure" e.g. for transport and communications by around 50 percent, whereas those of the United States and EU countries have a less focus on that purpose. At the same time, the commitment type of Japan's ODA depends highly on "loans" rather than "grants". From these observations, we speculate that the ODA received by the CLMV would be also utilized for economic infrastructure to a large degree. Developing economic infrastructure by getting ODA loans would give little room to raise consumption of non-tradables, and contribute directly to capital accumulation in the CLMV economies. We suppose, therefore, that the CLMV economies have not suffered from the Dutch Disease and have gained high economic growth.

Table 5 Characteristics of ODA to Asian Countries

Regional Distribution of ODA by DAC Donors in 2013-2014 (% of total)				
Donors	**Asia & Oceania**	**Africa & Middel East**	**Latin America & Caribbean**	**Europe**
Japan	73.4	21.8	2.8	2.0
Korea	61.4	29.2	8.6	0.8
United States	24.2	64.5	8.5	2.8
DAC-EU countries	32.4	52.7	9.7	5.2
Total DAC	38.5	49.0	8.5	4.0

ODA by Major Purposes in 2014 (% of total)			
Donors	**Social & administrative infrastructure**	**Economic infrastructure**	**Others**
Japan	17.1	48.9	34.0
Korea	40.7	34.2	25.2
United States	48.2	4.4	47.3
EU Institutons	29.3	33.1	37.6
Total DAC	37.3	19.3	43.4

ODA by Commitment Type in 2014 (% of total)			
Donors	**Bilateral grants**	**Bilateral loans**	**Other**
Japan	25.1	51.1	23.7
Korea	41.1	47.4	11.5
Total DAC	54.3	16.0	29.7

Source: Author´s elaboration using Statistics on Resource Flows to Developing Countries, OECD http://www.oecd.org/dac/stats/statisticsonresourceflowstodevelopingcountries.htm

4. CONCLUDING REMARKS

This paper investigated the economic impacts of foreign aid by focusing on the CLMV economies from the viewpoint on whether the foreign aid has caused the Dutch-Disease. The study examined the bilateral Granger causalities among foreign aid, the ratio of tradable-to-nontradable output and real GDP, and also estimated the impulse responses of real GDP to foreign-aid shock under a VAR-model framework. Through the empirics, we found the Granger causality from foreign aid not to the ratio of tradable-to-nontradable output but to real GDP, and also identified the significantly positive impulse response of real GDP to foreign-aid shock. This empirical outcomes implied that the CLMV economies have not suffered from the Dutch Disease and have rather enjoyed a positive production effect by receiving foreign aid. We speculated that the major use of foreign aid in the CLMV has focused on economic infrastructure, which has given little room for raising consumption and contributed directly to capital accumulation there.

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