

《Chapter 4》 Sustainable Development

The Economic Impact of the Official Development Assistance in the Mekong Economy: A Synthesis¹

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Abstract The paper analyzes the role of the ‘Official Development Assistance, ODA’ to synthesize with the rest of the papers in this journal. The ODA is determined from policy dialogue between donors and recipients. It is a public flow of resources other than FDI and Trade flow which are privately determined. The paper has shown that net ODA flow to each Mekong (CLMV) economy would have a positive economic impact differently owing to their level of economic development structure. The analysis by a dynamic Computable General Equilibrium (CGE) which is multi-sector and region has assumed a continuation of the net ODA (inclusive of Japan’s ODA) flow to the Mekong 2015-2020. It is assumed the flow to benefit the physical and social infrastructure. The simulation has shown that the ODA to education and skill training has also proved to have a significant impact on industrialization, strengthen trade in goods and services. It, however, has induced widening wage gap between CLMV and rest of ASEAN and Rest of World. Thus, we still have observed the tendency of the outgoing migration. The synthesis of all results will be the starting position of the Mekong economy to plan for their long-term sustainable growth and development.

Keywords Mekong, ODA, impact on Growth, Trade and Migration, sustainable growth and development potential of Mekong economy

JEL Classification C32, C51, C53, F12, F13, F14, F21

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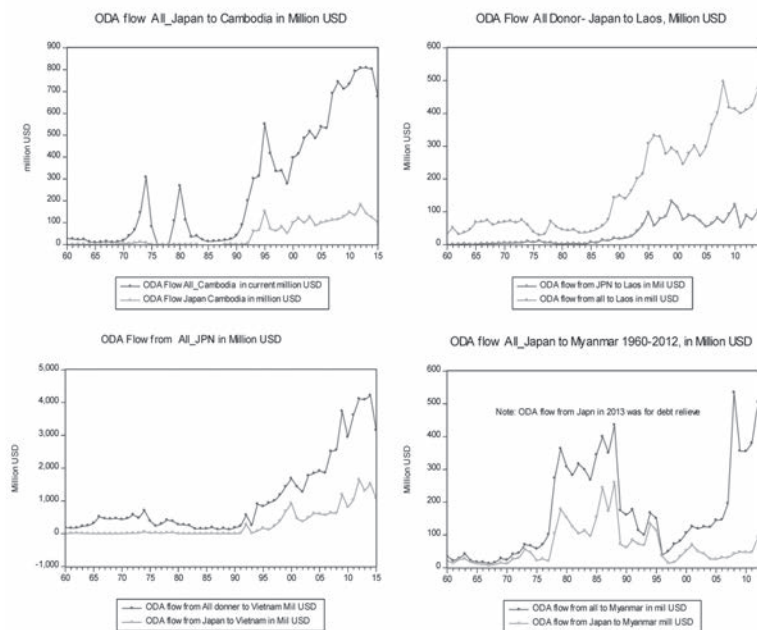
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1 Introduction

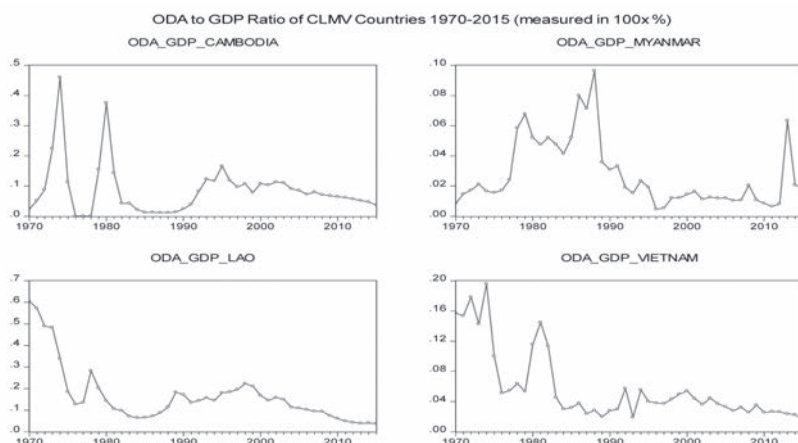
The ODA flow to Mekong economy, the CLMV was remarkable after the 1990's. During 1970-2015, ODA/GDP ratio was 16.6% p.a. for Laos, 8.6% p.a. for Cambodia, 2.76% p.a. for Myanmar, and 5.76% p.a. for Vietnam respectively. The annual average of Japan's ODA/GDP during the 1990-2015 period was 1.46, 2.04, 0.55 and 0.94 percent for the Cambodia, Laos, Myanmar, and Vietnam respectively, indicating that Laos was still on average the largest recipient of Japan's ODA in her GDP.

Thus, in order to fulfill the roll of ODA mentioned above, we, therefore, apply a Computable General Equilibrium Model to estimate the impact of external flow from official sources like ODA into the Mekong countries like Cambodia, Laos, Myanmar, and Vietnam. The multi-regional CGE model will provide an interactive feedback between these selected Mekong with Thailand, rest of ASEAN and Rest of the World. We will try to answer the research question that what if ODA flow to the selected economies in continuation from pre-AEC (ASEAN Economic Community) integration in 2015-until 2020.

Fig.1 Comparison of ODA flow from All Donors and Japan 1960-2015



Source: OECD <https://www.oecd.org/development/stats/idsonline.htm>



Source: OECD <https://www.oecd.org/development/stats/idsonline.htm>

Note: ODA to Myanmar in 2013 was inclusive of 'debt relieve,' therefore showing a 'spike' ratio.

2 Econometric Model

2.1 A Conceptual Framework on the Social Infrastructure ODA

In the model, we assume that human capital can be represented by the 'Human Development Index'³. The ODA is expected to increase with the index over time, other things being constant⁴. Human Development Index (HDI)⁵ emphasizes human ultimate capabilities for assessing the development of a country, not economic growth alone. The Human Development Index (HDI) is a summary measure of average achievement in critical dimensions of human development: *a long and healthy life, being knowledgeable and have a decent standard of living*. The HDI is, therefore, scores of a composite index of the geometric mean of three normalized indexes.

The *health* dimension is assessed by life expectancy at birth; the *education* dimension is measured by mean of years of schooling for adults aged 25 years and more and expected years of education for children of school entering the age. The standard of living dimension is measured by gross national income per capita. The HDI uses the logarithm of income, to reflect the diminishing importance of income with increasing GNI.

Model

The econometric model is represented by the logarithmic relationship between HDI and labor supply potential can be read as follows: *a 1 % change of HDI score leads inversely to the growth of supply potential or namely human capital growth of x% per year*. It can be read also that 'an inverse mapping of a 1% change in

3 <http://hdr.undp.org/en/data>

4 The gross domestic product or income may be endogenously determined the HDI while ODA is exogenous.

5 <http://hdr.undp.org/en/content/human-development-index-hdi>

human capital leads to an increase of HDI score, (1/x) % from baseline.

Definition and assumptions

HDI $\sim \mathbf{F}$ as a function of {ODA}

According to UNDP⁶, HDI is index of human capital investment (HC)

HC $\sim \mathbf{R}$ as an inverse mapping of {HDI}

HC \Leftrightarrow measured as ratio of {Labor supply potential/population}

At equilibrium, the economy-wide GDP is defined as a function of 'Total Factor Productivity'; marginal productivity of labor and capital; as well as Human capital, {simultaneously}. It is [exogenously] determined from the ODA and FDI flow.

{GDP Growth} \Leftrightarrow {TFP (total factor productivity), Marginal Productivity of Labor, Capital and Human Capital} \Leftarrow [ODA, FDI, Z]

The system of equations for (1) Determination of Labor Supply (with skills formation effect) and (2) HDI as the development of social change

$$\mathbf{Log (Labor Supply/Population)} = a + b*\mathbf{log(HDI)} + c*\mathbf{log(Z)} + \mathbf{error term (\zeta)} \quad (1)$$

$$\mathbf{Log (HDI)} = d + e*\mathbf{log(ODA)} + f*\mathbf{log(Z)} + \mathbf{error term (\xi)} \quad (2)$$

i= CLMV country. The HDI is further determined exogenously by the official development assistance (ODA) that a country (i) received. The Z(i) is other factors such as FDI (Foreign direct investment) etc. We will test hypotheses if HC-HDI elasticity b (i)>0 and HDI-ODA elasticity e(i)>0 are refutable and statistically different from zero. And (3) Determination of GDP or income and welfare.

$$\mathbf{Log (GDP/Labor)} = \mathbf{TFP} + h(i)*\mathbf{log(Capital stock service/Labor)} + \mathbf{error term (\epsilon)} \quad (3)$$

The GDP growth is determined by the growth of Total Factor Productivity (TFP) of overall economy h(i)>0, as postulated above. It is also driven by rising marginal productivity of capital and labor accordingly.

2.2 Economic Impact of ODA: An Econometric Estimation

Tran V. H., Limskul K. (2017) has shown that Japan's ODA has a somewhat weak impact on the CLMV economic achievement. The authors have relied on the partial economic model on the demand side or expenditure account of the SNA using GMM estimation method. The result is quite clear that the Mekong economy had benefited from Japan's ODA. In addition, Limskul K. and Tran V.H. (2017) have further applied a simultaneous system of dynamic demand and supply by adding the capital stock formation to the GDP production. They have shown that Japan's ODA had an economic impact on growth via trade openness as well as capital accumulation. In their system equation estimation, the ODA flow can affect the score of HDI in both positive and negative direction. For Cambodia and Laos, the ODA flow 1 percent will

6 (<http://hdr.undp.org/en/content/human-development-index-hdi>)

contribute to the rising of HDI by 0.02% at 99% significance level. It is surprisingly quite high for Laos. The increment of ODA flow 1% will likely to raise HDI by 0.40%. This may mean that Laos would still in need the development of her human capital and welfare. Even though Laos has received both public ODA and private FDI flow, she again acquires further development via the proper ODA flow as well on welfare development. The ODA flow has a *negative* relationship with HDI for Vietnam (-0.01) and Myanmar (-0.015) though with less significance level.

In our paper, we have applied the *simultaneous system of the ODA on HDI determinations*. It is the system estimation of growth, trade openness, physical and human capital growth as a result of FDI and ODA in the Mekong economy. (See appendix for estimation results).

The Average Labor Productivity Growth and Capital Intensity

In Cambodia, the capital intensity (capital-labor ratio) growth of 1.0 percent gives rise to the average labor productivity growth of 0.50 percent in terms of elasticity. It is surprising that the increase of capital intensity of Laos and Vietnam do not contribute to the growth of average labor productivity. Their estimated elasticity is 0.00023 for Laos and 0.00017 for Vietnam. The capital intensity growth elasticity for Myanmar is quite high, namely 0.8233.

Trade Openness and Demand Side Effect of ODA, FDI

The ODA and FDI have made a vibrant effect on the demand side of CLMV as well though in different stage and structure of the relationship. In the case of Cambodia, the country is open to the outside world. Her trade openness is determined by her real exchange rate adjustment as well as GDP growth of her trading partners in the ASEAN, as well as East Asia. Laos as the land locked economy, on the opposite, has been inward-looking policy than neighbors. The growth of neighboring countries like Thailand, Vietnam as well China has less impact on Laos's openness. Laos has concentrated on domestic demand for investment such as the long-term hydroelectric generation investment aiming to supply for ASEAN and rest of Asia. Laos has her openness positively determined by the terms-of-trade effect while the ODA flow over GDP ratio has an *adverse* impact on her trade openness. It is not surprising to see the *negative* relationship of ODA-GDP ratio and trade openness in Myanmar. The ODA to Myanmar would have instead supply financial resource to close a long-term gap desperately needed by Myanmar for her internal structural changes. We have calculated the inverse elasticity of HC-HDI to calibrate inversely how large the HC will raise the HDI score. For Cambodia, it is $(1/0.21)=4.7\%$, for Laos $(1/0.53)=1.8\%$, and $(1/0.86)=1.16\%$ for Vietnam. It is $(1/0.74)=1.3\%$ for Myanmar respectively.

The simultaneous equation in our study *cannot* disentangle the real impact of the ODA. We can only deduce that the ODA has a positive impact on the economy-wide. The ODA together with the FDI and other exogenous factors have *simultaneously* affected the growth of productive human capital, physical capital, trade, and finally the GDP growth of CLMV.

3 The Economic Impact of the ODA to CLMV (2016-2020): A CGE Model

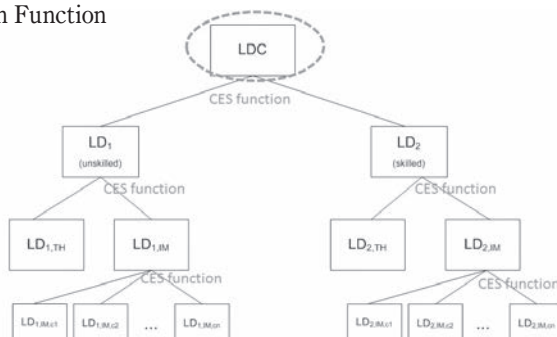
In our study, we utilize the regional CGE model⁷ to see the viability of ODA to the CLMV. We raise a question that if ODA from all donors (including Japan ODA) would continuously flow to the region what would be their growth potential over the medium-term 2015-2020. We postulate that the ODA would still stimulate the growth potential through a structural change of each country. We hypothesize that increment of ODA from donors to CLMV would have a positive impact on the HDI score as we have mentioned earlier.

The migration block of our CGE model has ‘explicit’ relationship between Thailand and CLMV countries. Countries comprise the CLMV which are Cambodia, Laos, Myanmar, and Vietnam and Thailand, ‘Rest of ASEAN’ and ‘Rest of the World’ respectively. Sectors are aggregated as follows: (1) Wheat, cereal, grains, vegetables and fruits, (2) Meat and meat products, (3) Extraction, (4) Processes food, (5) Textiles and wearing apparel, (6) Light manufactures, (7) Heavy manufactures, (8) Utilities, (9) Transportation and communications, (10) Other services respectively.

Following Walmsley et al. (2007), the nested structure consists of three layers of selection. The first layer is the decision of choosing the combination of skilled (LD_1) and unskilled labors (LD_2) which yields the lowest cost. In the second tier, for each type of labor l , the private employers select the optimal proportion of local workers ($LD_{l,Lo}$) and immigrants ($LD_{l,IM}$). Then the last layer is the optimal selection of immigrants from various countries of origin. (see Figure 2).

In our model, it is implicitly assumed the labor supply response function in each CLMV may be a result of ODA from all donors including Japan’s ODA. The labor supply response function is not explicitly defined in the CGE model. The ODA is a financial variable and may be inconsistent if being directly substituted into the labor response function. In our study, we will assume that ODA has affected the human capability through the shifting of parameters in the wage variable as follows.

Fig.2 Nested Production Function



⁷ Our CGE model is GAM based CGE model. The model structure and notation followed PEP <http://www.pep-net.org/pep-w-t-multi-region-recursive-dynamic-world-model>. We have added the migration block among CLMV, Thailand, and Row as shown in Fig. 3 and 4 respectively. The base data of our model is from the GTAP database. GAMs and GTAP is official License to Kittu Limskul.

Berrittella (2012) defines the labor supply curve which is the inverse function of wage. This model applied the projection of labor force in Thailand⁸ and countries of origin of migrants⁹ as the value of $LMAX$. The labor supply function is determined by $LMAX$ and reverses wage function. The shift parameter and the elasticity of labor supply are determined by human capital investment in the long-run. It is also affected by the ODA from abroad by all donors, especially, Japan's ODA which has a significant role in CLMV main topic in this study.

$$LS_{l,t} = LMAX_{l,t} \frac{\beta_{l,t}}{Wage_{l,t}^{\alpha_{l,t}}}$$

where

- $LS_{l,t}$: Supply of type 1 labor
- $LMAX_{l,t}$: Maximum of working force of type 1 labor
- $Wage_{l,t}$: Average wage of type 1 labor
- $\beta_{l,t}$: Constant of labor supply equation (for type 1 labor)
- $\alpha_{l,t}$: Elasticity of labor supply equation (for type 1 labor)

The ODA would be assumed to affect the human capital development of CLMV. The labor supply response is shown by a shift parameter in the supply function $\beta_{l,t}$, and elasticity of labor supply with respect to wage $\alpha_{l,t}$ above. The ODA has implicitly raised the human capital through 'mean years of schooling'. It thereby increases the effective labor supply. The total ODA from all donors including Japan's ODA would have an impact on capital investment in the infrastructure or capital stock formation as well. However, it is not in an explicit formulation as ODA is financial value in nature. We assume that the ODA would have an indirect impact via shifting in the production capability of the manufacturing sector. In our model, the impact of ODA on the total factor productivity is shown by a shift parameter in the production function of the manufacturing industry. In sum, the ODA will induce impact through labor and TFP for sustainable growth in the long-run.

Figure 3 and 4 below illustrates the primary structure of the model of the Mekong economy, rest of ASEAN and the rest of the World respectively. Figure 3 shows the linkages of trade flows where total exports and total imports of each trading products are equalized by the world market's price adjustment. Figure 4 exhibits the structure of international migration, in which all emigrants and immigrants affect the labor supply of both countries of origin and destination. The balance of this movement is constrained by

8 The official projection of the Thai population has been jointly conducted by the National Economic and Social Development Board and Institute of Population and Social Research of Mahidol University

9 The projection of population and labor force of Myanmar, Lao PDR and Cambodia is undertaken from international sources such as the World Bank and ADB.

the labor migration matrix. The system flow, therefore, represents a system of equations and parameters calibration.

Firstly, we have projected the CGE model solution from 2007-2010 to construct our base period 2010 for further analysis. The in-sample projection's result in terms of 'Root Mean Squared Error' is less than 10% during 2007-2010¹⁰. These validation outcomes ensure that the dynamic multi-region CGE model developed in this study is consistent with published data in 2007-2010. The base case projection (i.e. denoted as the Business as Usual or BAU scenario) shows that the Thai economy will grow at the rate of 3.88% to 4.16% annually. On the other hand, the annual growth of CLMV will be higher, at around 6.3 to 7.84%, due to their stage of development. This projection also indicates that all regions will continuously grow and in 2020 the value of income per capita of CLMV will almost double to that of 2010. The paths of development of CLMV follow the 'Latecomers' hypothesis, denoting that CLMV will gradually converge to a middle-income country. The income per capita of these countries will catch up that of Thailand and the gap of the stage of development between Thailand and CLMV will be bridged over time.

The projection result shows that trade flows among Thailand and CLMV will increase. Mainly Vietnam will be the biggest trading partner of CLMV nations. The simulation results indicate that Thailand may choose to import agricultural commodity and heavy industry products from Vietnam. On the other hand, the main Thailand export to Vietnam is the heavy industry products. The main export from Thailand to Cambodia and Laos will be heavy industry products and processed foods. In the case of Myanmar, the simulation shows that extraction production (i.e. mining and natural gas) will be the primary exports to Thailand. The export of Thailand to Myanmar will be heavy industry products and processed foods. It is noted that the growth potential as shown by growth rates of GDP among CLMV have been higher than that of Thailand. Thai economy has shifted her growth potential after the financial crisis to be merely 4.45% annually.

With the foregoing economic epochal visioning, we, therefore, assume the exogenously shift in their total factor productivity. For Cambodia and Laos, we believe that the continuation of foreign direct investment (FDI) and ODA will induce an exogenous shift in the 'Total factor productivity' by 1.5 percent per year during 2015-2020. In addition, the TFP growth for Vietnam is assumed to be 1.0 percent per year as Vietnam has reached sustainable development and may need less ODA. Myanmar on the contrary, is looking for a new epoch of economic development after long years of inaccessible to world market for her trade, FDI and ODA. Myanmar's TFP is assumed to increase 5.0 percent per year in the next medium-term phase of economic development following the 'latecomer hypotheses.

The CGE model requires calibration of parameterization of the HDI-ODA pair independently for each CLMV country. Our partial econometric estimation below shows the exogenous impact of an increase of 1% of ODA disbursement. It will raise the HDI score of 0.33% for Cambodia, 0.47% for Laos, 0.05% for

10 Except the case of Cambodia's import which has the value of RMSE of 12.22%.

Fig. 3 A CGE Model of the International Trade Linkage

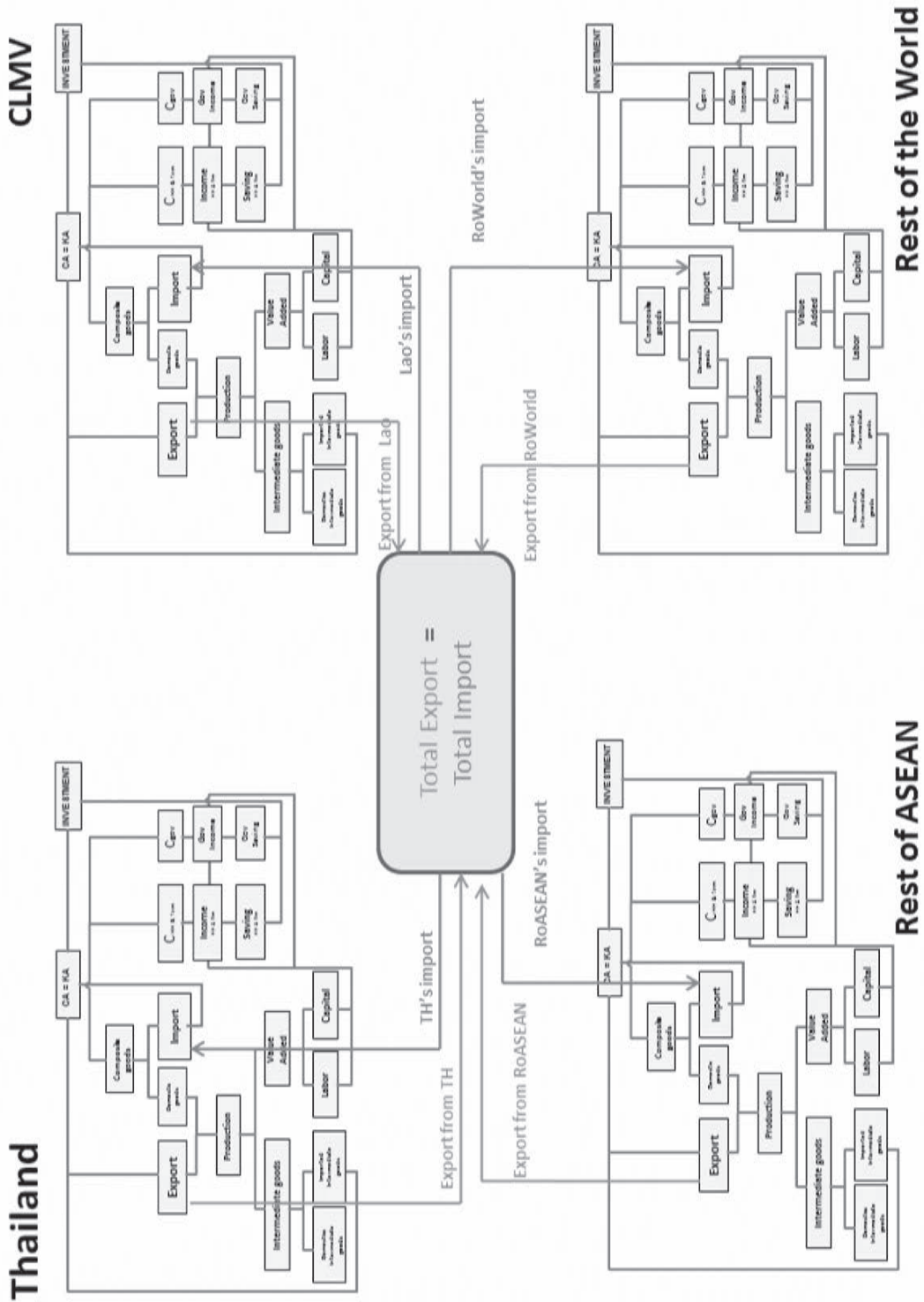
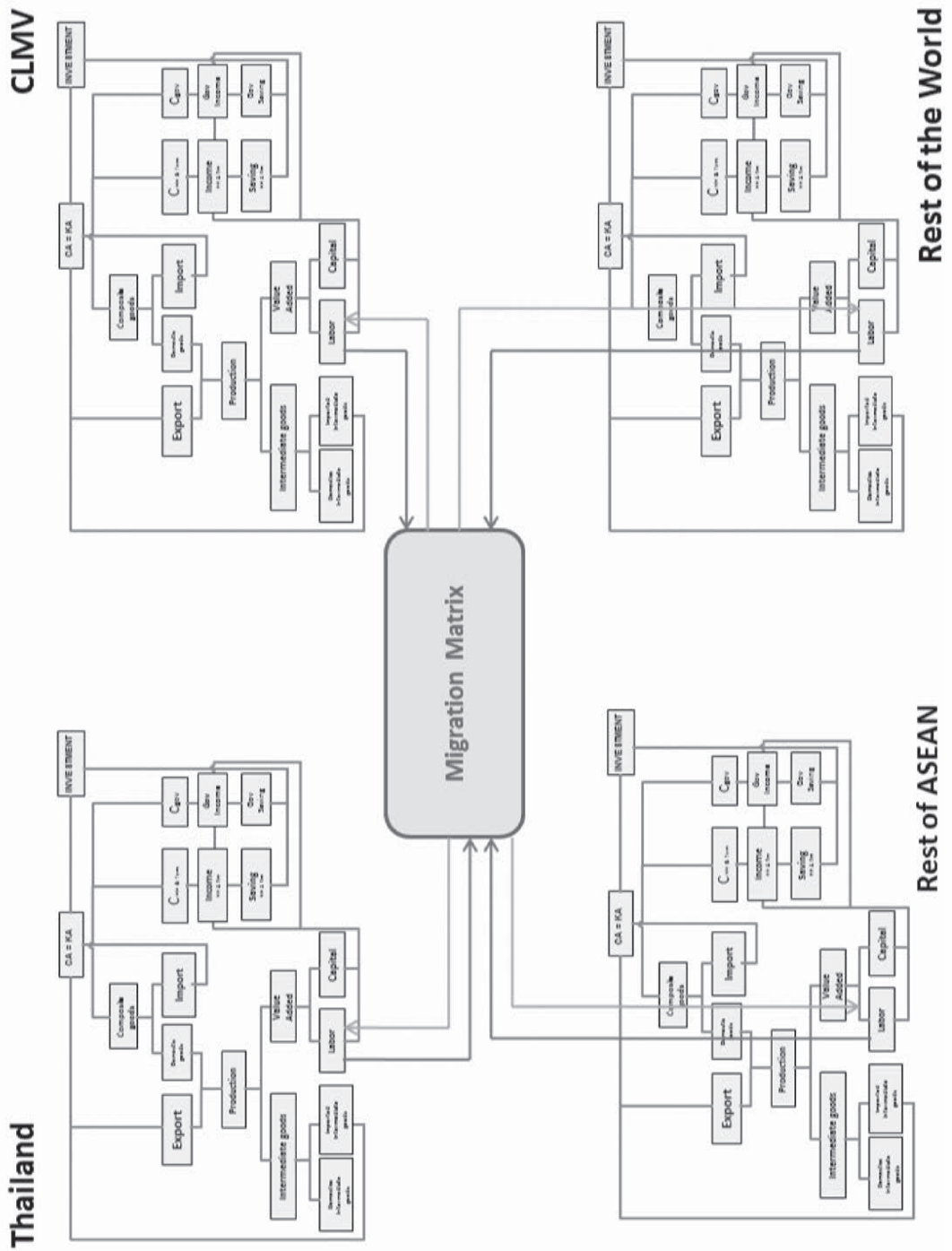


Fig.4 A CGE Model of the Labor Migration Linkage



Vietnam and 0.08% for Myanmar accordingly.

We have also estimated the partial relationship of the HC-HDI. The HC is measured as the ratio of labor*-population ratio¹¹ in the labor force survey. In this study, this ratio is assumed to determine the rising of HDI score, if its null hypothesis is refutable. The elasticity of HC-HDI in CLMV is as follows. They are 0.21 for Cambodia, 0.32 for Laos, 0.23 for Myanmar and 0.20 for Vietnam. Null hypotheses are rejected, with high coefficients of determinations. (R square is higher than 95 %).

Table 1 Hypothetical ODA from all donors to CLMV countries: 2016-2020 (Million USD)

	<u>2015 Base</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>
ODA to Cambodia	677.06	703	710	709	729	733
ODA to Laos	471.09	494	519	544	571	599
ODA to Myanmar	1,168.52	1,224	1,283	1,345	1,409	1,477
ODA to Vietnam	3,157.44	4,006	4,176	4,000	3,800	3,713

Source: This study applying Auto-Regressive Integrated Moving Average (ARIMA) model.

4 The Prospect of Macroeconomic Growth, Industrialization and Income Distribution

ODA Impact on the Macro-Economic Growth

The resource flow from donors to CLMV in terms of ODA net disbursement flow has added on the scarce resource (savings) to finance domestic investment and growth. The medium-term real GDP growth during Post AEC Integration (2016-2020) is impressive for Myanmar and Laos. Even though Myanmar is late-comer, she has tried hard with intensive engagement in the industrialization of her country. Laos has developed electricity generation facilities several locations to earn foreign currency from electricity export in the medium to long-term. Vietnam has been deepened her industrialization and trade after entering the world trade system for sometimes. Cambodia has developed her textile and apparels light manufacturing with a quite impressive success.

Economic growth has been driven from the demand side as can be seen from domestic absorption by real consumption and investment expenditure. The export demand, as well as import demand growth, has confirmed that CLMV's rapid 'openness'. Here, the growths scenarios from demand side are driven by own potential efforts as well as a further impulse by the ODA from abroad. This can be seen from the positive change of growth aspect between scenarios (SIM) and past trend (Business as Usual, BAU). The macroeconomic growth has a favorable effect on the total government revenue as well.

¹¹ The labor force survey has reported only the employed person which means an equality of labor demand and supply at a point in time. Thus, labor* stands for equilibrium labor supply-demand or employment. The higher employment equilibrium level is the result of proper matching between the demand for skills labor and potential labor supply with rising skills. The skills are formed by educational investment; training and health as well as the welfare level of a country from HDI standpoint.

ODA impact on the Economic Stability

We have investigated whether the ODA flow would have any effect on external macroeconomic stability. It is found that the economic growth of Cambodia and Laos and Vietnam have still stimulated external instability. The current account deficit-GDP ratio of these three countries has been deteriorated. The ODA flow as net resource flow into the economies has however improved such external instability. Myanmar, on the other hand, has enjoyed current account surplus in the medium-term with minor deterioration as a result of ODA flow. For CLMV's internal stability, it can be shown from consumer's price inflation for Myanmar and Vietnam. It has increased less than one percentage point. Inflationary pressure has been declined for Laos and Cambodia. The ODA did not destabilize the macro-economy of CLMV. The CGE model simulation may help justify the role of macroeconomic management in Mekong economy as in the example of Cambodia pointed out by Samreth S. et. al (2018). The ODA flow will strengthen the macroeconomic prudential management.

Table 2 The Macroeconomic forecast for CLMV 2016-2020

	Post AEC Integration 2016-2020: Unit % per year					
	Real GDP Growth		Export Value Growth		Import c.i.f. Growth	
	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM- BAU</u>	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM- BAU</u>	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM- BAU</u>
Cambodia	5.79	+0.18	6.55	+0.32	6.54	+0.30
Laos	7.57	+0.40	9.30	+0.49	9.25	+0.46
Myanmar	9.37	+0.37	8.01	+0.35	8.43	+0.41
Vietnam	4.70	+0.12	5.05	+0.22	5.15	+0.17
	Post AEC Integration 2016-2020: Unit % per year					
	Real Consumption Growth		Real Investment Growth		Total Value of Government Income Growth	
	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM- BAU</u>	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM- BAU</u>	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM- BAU</u>
Cambodia	3.59	+0.26	7.96	+0.14	1.82	+0.20
Laos	7.02	+0.60	6.37	+0.39	4.90	+0.41
Myanmar	8.95	+0.40	7.60	+0.42	8.72	+0.63
Vietnam	4.41	+0.18	4.56	+0.04	3.80	+0.20

Note: The Scenario (SIM) applies the ODA growth using the ARIMA model, 2016-2020.

The Business As Usual (BAU) assumes ODA level equal to 2015 level during 2016-2020.

Table 2 The Macroeconomic forecast for CLMV 2016-2020 (continued)

	Post AEC Integration 2016-2020: Unit % per year					
	Current Account Balance/GDP Ratio, %		Total HH Income Growth		The growth of Labor/Total HH Income Ratio	
	Scenario: Impact of Net ODA Flow 2016-2020	%Improvement (+) from BAU or SIM-BAU	Scenario: Impact of Net ODA Flow 2016-2020	Different between SIM-BAU	SIM: Labor/Total Income Ratio	Different between SIM-BAU
Cambodia	-1.47	0.03	6.03	0.19	-0.02	0.09
Laos	-1.24	0.04	7.56	0.44	-0.18	0.69
Myanmar	3.57	-0.06	9.56	0.66	0.04	0.66
Vietnam	-0.77	0.13	5.17	0.20	-0.03	0.15
	Post AEC Integration 2016-2020: Unit % per year					
	Unskilled Wage Growth		Skilled Wage Growth		Inflation	
	Scenario: Impact of Net ODA Flow 2016-2020	Different between SIM-BAU	Scenario: Impact of Net ODA Flow 2016-2020	Different between SIM-BAU	Scenario: Impact of Net ODA Flow 2016-2020	Different between SIM-BAU
Cambodia	4.75	-0.85	5.58	0.79	-0.77	-0.02
Laos	5.63	-0.48	5.71	0.11	-0.50	-0.01
Myanmar	8.17	-0.30	9.00	0.66	0.11	0.25
Vietnam	3.7	0.03	3.76	0.02	0.04	0.03

ODA and Income Distribution

It is always a question whether ODA flow has worsened the income distribution of developing countries. In our study, even though the ODA flow to CLMV has raised a household's income in the CLMV. The ODA flow scenario (SIM) has contributed to the household income growth as compared to the business as usual (BAU). Surprisingly, the ODA flow has deteriorated the factor income distribution of household. Labor income share of Cambodia, Laos, and Vietnam have deteriorated during 2016-2020. In other words, the ODA flow (SIM) has biased in favored of the capital income. Myanmar, on the contrary, has a minimally progressive household income distribution. The growth of labor income share in the case of SIM is higher than the BAU case but not consistent with the overall household's income growth.

It is interesting to see that the ODA flow (SIM) has stimulated the growth of the wage index in the region for both skilled and unskilled wage. The wage growth in the scenario of ODA flows over the past trend (BAU). The skill wage index was induced to grow at a higher rate than the case of unskilled wage during 2016-2020. This signifies the role of ODA flow. Thus, ODA may be said to have deepened the labor skills formation in the CLMV over time. This may raise the question whether the 'Turning point' of Vietnam and Cambodia would be in a near future following Thailand as has been proved by Bowonthumrongchai T. (2018).

ODA and Industrialization

The labor skill formation together with the physical infrastructure investment in CLMV may have induced the total factor productivity growth from the supply side. On the demand side, the higher degree

of trade openness as a result of FDI and ODA has positively linked to the growth potential of CLMV. This can happen with the industrialization process. The ODA flow in the case of scenario (SIM) has induced a rapid industrial growth in the region as compared with the BAU case. The structural change of industry in CLMV is interesting. The share of primary sector (comprising Grains and crops, livestock and meat product, and Mining and Extraction) in Laos (49.3%) and Myanmar (48.39%) are still high when compared to Vietnam (40.52%) and Cambodia (31.83%). The share of primary value added of Cambodia and Vietnam have been declining during 2016-2020. This signifies structural change away from primary industries. Myanmar and Laos on the contrary still have their primary sector's share increased with ODA flow. The value-added share of 'Processed Food Textiles and Clothing' for Cambodia (16.63%) and Laos (12.15%) are much higher than those of Vietnam (6.20%) and Myanmar (1.82%). Cambodia is base for textiles and clothing production while Laos is the destination of foreign direct investment in processed food and drink. The ODA flow scenario has induced industrialization in these industries. Its share has surpassed over its BAU. The share of the 'Other Light Industries and Heavy Manufacturing Industry' of Vietnam (12.52%), Laos (10.8%) and Myanmar (9.41%) are still in their early stage. Although the classification of sectors is somewhat arbitrary, the most important is to realize that the increase of the ODA flow is *positively* correlated with the 'Light and Heavy' industrialization process in CLMV. It is interesting to see that share of the 'Services Industry' of Cambodia, Laos, and Vietnam except Myanmar will be decreased when ODA has increased. The overall conclusion can be said that there are structural changes in favor of manufacturing growth when CLMV has obtained ODA flow from abroad. This may be comparable with the findings by Ketsawa W. (2018) in this journal despite different in the epoch of development. That is to say Mekong economy especially Vietnam seems to climb up the GVC following Thailand. This is consistent with the study pointed out by Taguchi H. et al (2018) in this journal.

Migration Outflow and Indirect Economic Impact on Thailand and Other ASEAN

The ODA has affected the wage of skilled labor as well as unskilled labor. The wage gap still exists between CLMV and destination like Thailand. Thus, an outflow of migrant to Thailand and Other ASEAN continues. In 2020, Thailand as the destination of CLM emigrants will absorb foreign migrant from Myanmar 1.599 million persons. Thailand has minor indirect benefit from the ODA flow to CLMV. Interesting enough, the rest of ASEAN have a tendency of *net loss* while Rest of the World has a tendency of *net benefit*. All benefit and loss minimally change from BAU. The net gains are consistent with export and import growth of scenarios (SIM) over its BAU trend.

Table 3 Medium-Term Growth Scenarios 2016-2020

	Post AEC Integration 2016-2020: Unit % per year					
	<u>Grains and Crops (1)</u>		<u>Livestock and Meat product (2)</u>		<u>Mining and Extraction (3)</u>	
	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM-BAU</u>	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM-BAU</u>	<u>SIM: Labor/Total Income Ratio</u>	<u>Different between SIM-BAU</u>
Cambodia	5.10	0.02	5.42	0.28	6.14	0.61
Laos	6.98	0.32	7.12	0.55	9.09	0.87
Myanmar	9.18	0.20	9.15	0.25	9.62	0.76
Vietnam	5.32	-0.16	4.49	0.16	5.81	0.63
	Post AEC Integration 2016-2020: Unit % per year					
	<u>Processed Food (4)</u>		<u>Textile and Clothing (5)</u>		<u>Light Manufacturing (6)</u>	
	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM-BAU</u>	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM-BAU</u>	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM-BAU</u>
Cambodia	5.05	0.54	6.62	0.49	9.25	0.51
Laos	7.67	0.73	10.37	0.74	11.83	1.00
Myanmar	8.83	0.32	9.98	0.76	9.51	0.65
Vietnam	4.67	0.29	4.18	0.07	4.99	0.23

Table 3 Medium-Term Growth Scenarios 2016-2020 (continued)

	Post AEC Integration 2016-2020: Unit % per year					
	<u>Heavy Manufacturing (7)</u>		<u>Utilities and Construction (8)Communication (9)</u>		<u>Trade, Transport, and</u>	
	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>%Improvement (+) from BAU or SIM-BAU</u>	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM-BAU</u>	<u>SIM: Labor/Total Income Ratio</u>	<u>Different between SIM-BAU</u>
Cambodia	7.03	0.52	7.36	0.19	6.31	0.25
Laos	10.79	0.49	7.64	0.39	8.55	0.46
Myanmar	9.47	0.63	9.50	0.50	9.21	0.48
Vietnam	5.09	0.29	4.84	0.09	4.78	0.13
	Post AEC Integration 2016-2020: Unit % per year					
	<u>The share of Primary Industry (1)+(2)+(3)</u>		<u>The share of Processed Food Textiles and Clothing (4)+(5)</u>		<u>The share of Other Light and Heavy Manufacturing (6)+(7)</u>	
	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM-BAU</u>	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM-BAU</u>	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM-BAU</u>
Cambodia	31.83	0.08	16.63	1.00	3.96	0.94
Laos	49.30	-0.05	12.15	0.88	10.80	0.45
Myanmar	48.39	-0.40	1.82	0.48	9.41	1.43
Vietnam	40.52	0.34	6.20	0.19	12.52	0.47
	Post AEC Integration 2016-2020: Unit % per year					
	<u>The share of Services Industry (8)+(9)+(10)</u>		<u>All Migration Outflow from CLMV</u>		<u>Migration Inflow to Thailand from CLMV</u>	
	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM-BAU</u>	<u>Scenario: Impact of Net ODA Flow 2016-2020</u>	<u>Different between SIM-BAU</u>	<u>SIM: Labor/Total Income Ratio</u>	<u>Different between SIM-BAU</u>
Cambodia	47.58	-0.48	3.67	0.10	4.86	0.01
Laos	27.75	-0.46	3.55	0.10	4.86	0.01

Myanmar	40.38	0.13	4.57	0.11	4.85	0.01
Vietnam	40.76	-0.51	3.05	0.11	4.86	0.01

Note: The Scenario (SIM) applies the ODA growth using the ARIMA model, 2016-2020.

The Business As Usual (BAU) assumes ODA level equal to 2015 level during 2016-2020.

Table 4 Medium-term Forecast of GDP Growth, 2016-2020, measured as Percentage Change from the Base Path 2016-2020.

	2016	2017	2018	2019	2020
Thailand	0.009	0.008	0.010	0.012	0.014
Rest of ASEAN	-0.003	-0.003	-0.003	-0.003	-0.004
Rest of the World	0.000	0.001%	0.001%	0.001	0.001

Note: In the base path scenario, we assume the ODA level of 2015 for 2016-2020.

Table 5 Medium-term Forecast of Migration Flow between the CLMV, Thailand, Rest of ASEAN, and the Rest of the World 2020

	Cambodia	Laos	Myanmar	Thailand	Vietnam	Rest of ASEAN	Rest of the World
Cambodia		1,744	76	272,430	159	10,723	355,744
Laos	1,228		85	232,560	226	13,829	390,170
Myanmar	245	508		1,599,225	797	49,502	215,283
Thailand	142,202	6,115	189		1,405	236,894	758,911
Vietnam	173,008	12,056	491	16,321		64,678	2,293,910
Rest of ASEAN	2,308	27	1,474	31,136	11,386		5,536,087
Rest of the World	15,210	5,999	276,966	804,396	17,089	3,012,682	

5 Discussions and Synthesis

Growth prospect of CLMV can be continued during post-AEC Integration 2016-2020 as result of FDI, Trade Openness, and ODA. The ODA which Japan's ODA as a significant donor is able to drive economic growth in Mekong or CLMV as expected. The trade openness shown by the export and import growth in CLMV is impressive. The current account has been deteriorated among members country. But the overall, external and internal stability judging from current account deficit and consumer price inflation are stable and manageable. Household private consumption which represents the welfare of household has increased as a result of ODA flow (SIM) over the BAU. Likewise, CLMV can rely on own gross fixed capital formation as the private sector grows; the government's income has been satisfactorily increased as well.

On the supply side, *ODA has induced industrialization* along with growth in favor of manufacturing. This is consistent with the changing wage index as a result of skill formation of labor. The wage index growth implies a labor productivity growth as well. In fact, the ODA flow has exogenously induced the 'Total Factor Productivity' growth of the overall production system as well. The scenario ODA flow (SIM) has

induced a wage growth and TFP growth over the BAU in favor of skill wage earners in general.

The Real wage growth in CLMV has induced the increase of household's labor income. Interesting enough, the factor income distribution is *in favor of capital income* rather than labor income share. Despite wage growth and industrialization, out-migration from CLMV is still continuing during 2016-2020. The *wage gap* between CLMV and neighboring country like Thailand and Rest of ASEAN has *attracted an outflow of a migrant from CLM* in particular.

Vietnam, on the other hand, has been the main recipient of FDI and ODA for some time has been able to outreach her trade openness towards international markets. *Vietnam has shown rapid industrialization* in her industrial structure as well. *Myanmar is latecomer among CLMV in ODA destination. Myanmar has still concentrated in her initial industrial development. Cambodia has been advanced on her Textile and Clothing industry* while Laos is the destination of Process Food and Beverages as well Other Light Industries (Assembly line of motorcycles). Laos has been advanced on hydroelectricity generation and aimed to export of this product to neighbors.

In sum, Mekong CLMV's macroeconomic growth and stability, industrialization and structural change as well and the growth of household income and welfare will be continued if ODA flow would be increased 2016-2020. International donors and Japan's ODA which concentrates on the infrastructure and manufacturing prior to 2015 may need to reconsider to increase the ODA on 'social infra-structure' e.g., education, for the public as well as training for the private sector that leads to rising capability of management and means a year of schooling. The ODA from Japan and other donors has necessitated infrastructure development. It is the core of donors' ODA policy until recently. The social ODA in our study is proved to be a sufficient condition for growth and development in CLMV in the post-AEC Integration 2016-2020. Our study has added more general results to other studies on the Mekong economy.

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Appendix

Table A1 The System Estimation of Growth, Trade Openness, Physical and Human Capital Growth as a Result of FDI and ODA: Cambodia				
System Estimation for CAMBODIA				
Estimation Method: Three-Stage Least Squares				
Sample: 2000 2015				
Instruments: D03 D05 D08 D12 D13 FDI_GDP_CAMBODIA_CAMBODIA				
System of Equations	Coefficient	Std. Error	t-Statistic	Prob.
Equation 1:				
LOG(GDPR_CAMBODIA/LABOR_CAMBODIA) =				
constant	-10.50571	0.254168	-41.33366	0.0000
+LOG(CAPR_CAMBODIA/LABOR_CAMBODIA)	0.501546	0.036602	13.70278	0.0000
+ [AR(1)=C(3),UNCONDESTSMPL="1990 2015"]	0.621807	0.169657	3.665077	0.0006
R-squared	0.976802	Mean dependent var		-7.002160
Adjusted R-squared	0.971646	S.D. dependent var		0.168160
S.E. of regression	0.028316	Sum squared resid		0.007216
Durbin-Watson stat	1.197405			
Equation 2:				
LOG(LABOR_CAMBODIA) =				
constant	-19.29038	1.542801	-12.50348	0.0000
+ LOG(HDI_CAMBODIA(-3))	0.153975	0.053471	2.879593	0.0058
+ LOG(POP_CAMBODIA)	2.144746	0.093348	22.97574	0.0000
+ [AR(1)=C(7),UNCOND,ESTSMPL="1990 2015"]	1.306462	0.110726	11.79902	0.0000
R-squared	0.999378	Mean dependent var		15.77072
Adjusted R-squared	0.999171	S.D. dependent var		0.131166
S.E. of regression	0.003777	Sum squared resid		0.000128
Durbin-Watson stat	0.889163			
Equation 3:				
OPEN_RATIO_CAMBODIA =				
constant	29.35968	3.715511	7.901923	0.0000
+ RER_CAMBODIA(-2)	-4.21E-05	2.46E-05	-1.708185	0.0938
+ OPEN_RATIO_CAMBODIA(-2)	0.251526	0.072192	3.484117	0.0010
+ LOG(GDPR_CAMBODIA(-2))	-2.727955	0.232943	-11.71084	0.0000
+ GDPR_CJKSTMIP	8.97E-08	4.52E-08	1.984420	0.0527
+ [AR(1)=C (121),ESTSMPL="1994- 2011"]	0.963750	0.009658	99.78975	0.0000
R-squared	0.982099	Mean dependent var		1.147810
Adjusted R-squared	0.973149	S.D. dependent var		0.189907
S.E. of regression	0.031119	Sum squared resid		0.009684
Durbin-Watson stat	2.243639			
Equation 4:				
LOG(CAPR_CAMBODIA) =				
constant	20.26316	0.209406	96.76479	0.0000
+ LOG(FDI_GFCF_CAMBODIA(-1))	0.236126	0.058167	4.059425	0.0002
+ OPEN_RATIO_CAMBODIA (-3)	1.785103	0.170321	10.48083	0.0000
R-squared	0.935429	Mean dependent var		22.74804
Adjusted R-squared	0.921080	S.D. dependent var		0.443110
S.E. of regression	0.124481	Sum squared resid		0.139460
Durbin-Watson stat	1.320047			
Equation 5:				
LOG(HDI_CAMBODIA) =				
constant	-0.628219	0.088372	-7.108778	0.0000
LOG(ODA_ALL_CAMBODIA(-2)	0.021024	0.010978	1.915069	0.0612
/OPEN_RATIO_CAMBODIA(-1)				
+ [AR(1)=C(18),ESTSMPL="1991	0.901910	0.016960	53.17979	0.0000
R-Squared	0.994079	Mean dependent var		-0.693514
Adjusted R-squared	0.993169	S.D. dependent var		0.098732
S.E. of regression	0.008160	Sum squared resid		0.000866
Durbin-Watson stat	2.226892			
Determinant residual covariance	1.59E-19			

Table A2 The System Estimation of Growth, Trade Openness, Physical and Human Capital Growth as a Result of FDI and ODA: Laos				
System Estimation for LAOS				
Estimation Method: Three-Stage Least Squares				
Sample: 1992 2015				
Instruments: D03 D05 D08 D12 FDI_GDP_LAO RER_LAO C				
System of Equations	Coefficient	Std. Error	t-Statistic	Prob.
Equation 1:				
LOG(GDPR_LAO/LABOR_LAO) =				
constant	-7.215251	0.013704	-526.4978	0.0000
+(CAPR_LAO/LABOR_LAO)	0.000237	8.22E-06	28.86924	0.0000
R-squared	0.984731	Mean dependent var		-6.855909
Adjusted R-squared	0.983343	S.D. dependent var		0.177611
S.E. of regression	0.022923	Sum squared resid		0.005780
Durbin-Watson stat	2.384045			
Equation2:				
LOG(LABOR_LAO) =				
constant	6.854063	0.397180	17.25683	0.0000
+ LOG(HDI_LAO*POP_LAO)	0.535177	0.027718	19.30777	0.0000
+[AR(2)=C(5),UNCOND,ESTSMPL="1990 2015"]	1.380681	0.089377	15.44787	0.0000
R-squared	0.999007	Mean dependent var		14.75792
Adjusted R-squared	0.998897	S.D. dependent var		0.147197
S.E. of regression	0.004889	Sum squared resid		0.000430
Durbin-Watson stat	0.667805			
Equation 3:				
LOG(OPEN_RATIO_LAO/GDPR_LAO) =				
constant	-10.76253	1.034476	-10.40385	0.0000
LOG(ODA_ALL_LAOS(-1)/GDPR_LAO(-1))	-0.810689	0.365687	-2.216896	0.0299
+ TT_LAO	0.011665	0.005385	2.166281	0.0337
+(GDPR_CHINA+GDPR_THAILAND	-2.94E-07	4.68E-08	-6.266299	0.0000
+GDPR_VIETNAM)				
R-squared	0.832543	Mean dependent var		-8.800207
Adjusted R-squared	0.790679	S.D. dependent var		0.311768
S.E. of regression	0.142639	Sum squared resid		0.244151
Durbin-Watson stat	1.231350			
Equation 4::				
LOG(CAPR_LAO) =				
constant	0.021214	0.007308	2.903053	0.0049
+ LOG(CAPR_LAO(-1))	1.003855	0.003824	262.5274	0.0000
+ [AR(1)=C(11),ESTSMPL="19942011"]	0.898045	0.158696	5.658894	0.0000
R-squared	0.997617	Mean dependent var		22.21791
Adjusted R-squared	0.996596	S.D. dependent var		0.526416
S.E. of regression	0.030711	Sum squared resid		0.006602
Durbin-Watson stat	1.151801			
Equation 5:				
LOG(HDI_LAO) =				
constant	-2.978484	0.146751	-20.29616	0.0000
+ LOG(ODA_ALL_LAOS(-2))	0.402021	0.026375	15.24233	0.0000
+ [AR(1)=C(14),ESTSMPL="1991 2015"]	-0.005767	0.000782	-7.378223	0.0000
R-squared	0.896733	Mean dependent var		-0.777798
Adjusted R-squared	0.881243	S.D. dependent var		0.131112
S.E. of regression	0.045183	Sum squared resid		0.040829
Durbin-Watson stat	1.554552			
Determinant residual covariance		8.34E-17		
Note: Ibid				

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Table A3 The System Estimation of Growth, Trade Openness, Physical and Human Capital Growth as a Result of FDI and ODA: Vietnam				
Estimation Method: Three-Stage Least Squares				
Sample: 2000 2015				
Instruments: D03 D05 D08 D12 TT_VIETNAM RER_VIETNAM				
System of Equations	Coefficient	Std. Error	t-Statistic	Prob.
Eauation 1:				
LOG(GDPR_VIETNAM/LABOR_VIETNAM) =				
constant	-7.195281	0.025412	-283.1452	0.0000
+(CAPR_VIETNAM/LABOR_VIETNAM)	0.000174	7.77E-06	22.44507	0.0000
R-squared	0.973424	Mean dependent var		-6.653883
Adjusted R-squared	0.971008	S.D. dependent var		0.173014
S.E. of regression	0.029459	Sum squared resid		0.009546
Durbin-Watson stat	0.250840			
Eauation2:				
LOG(LABOR_VIETNAM) =				
constant	2.293839	0.040668	56.40469	0.0000
+ LOG(HDI_VIETNAM*POP_VIETNAM)	0.865391	0.002289	378.0339	0.0000
R-squared	0.999907	Mean dependent var		17.66647
Adjusted R-squared	0.999898	S.D. dependent var		0.079734
S.E. of regression	0.000805	Sum squared resid		7.12E-06
Durbin-Watson stat	2.058161			
Eauation 3:				
LOG(OPEN_RATIO_VIETNAM) =				
constant	-18.49824	1.071863	-17.25803	0.0000
+ LOG(ODA_ALL_VIETNAM(-1)	-0.411456	0.076227	-5.397781	0.0000
/GDPR_VIETNAM(-1))				
+LOG((GDPR_CHINA	1.088048	0.054808	19.85191	0.0000
+GDPR_JAPAN+GDPR_KOREA))				
+[AR(1)=C(71)]	-0.417238	0.150268	-2.776627	0.0074
R-squared	0.947775	Mean dependent var		0.258050
Adjusted R-squared	0.934718	S.D. dependent var		0.177118
S.E. of regression	0.045254	Sum squared resid		0.024575
Durbin-Watson stat	2.730624			
Eauation 4:				
LOG(CAPR_VIETNAM/GDPR_VIETNAM) =				
constant	5.565039	0.141933	39.20890	0.0000
+LOG(FDI_GFCF_VIETNAM(-1))	0.023410	0.007249	3.229317	0.0020
+ LOG(CAPR_VIETNAM(-1))	0.352762	0.005940	59.38794	0.0000
R-squared	0.997383	Mean dependent var		14.66457
Adjusted R-squared	0.996908	S.D. dependent var		0.158101
S.E. of regression	0.008792	Sum squared resid		0.000850
Durbin-Watson stat	1.243455			
Eauation 5:				
LOG(HDI_VIETNAM) =				
constant	-0.032017	0.013206	-2.424481	0.0185
+ LOG(ODA_ALL_VIETNAM(-1)	-0.010440	0.005017	-2.081174	0.0418
/GDPR_VIETNAM(-1))				
+ LOG(HDI_VIETNAM(-1))	0.980247	0.011965	81.92438	0.0000
R-squared	0.998648	Mean dependent var		-0.456845
Adjusted R-squared	0.998440	S.D. dependent var		0.055455
S.E. of regression	0.002191	Sum squared resid		6.24E-05
Durbin-Watson stat	2.649769			
Determinant residual covariance		7.13E-23		
Note: ibid.				

Table A4 The System Estimation of Growth, Trade Openness, Physical and Human Capital Growth as a Result of FDI and ODA: Myanmar				
System Estimation for MYANMAR				
Estimation Method: Three-Stage Least Squares				
Sample: 1992 2015				
Instruments: D03 D05 D08 FDI_GDP_MYANMAR TT_MYANMAR				
System of Equations	Coefficient	Std. Error	t-Statistic	Prob.
Equation 1:				
LOG(GDPR_MYANMAR/LABOR_MYANMAR) =				
constant	-6.936611	0.037528	-184.8407	0.0000
+ (CAPR_MYANMAR/LABOR_MYANMAR)	0.823358	0.025444	32.35929	0.0000
R-squared	0.981320	Mean dependent var		-8.056871
Adjusted R-squared	0.980282	S.D. dependent var		0.487458
S.E. of regression	0.068448	Sum squared resid		0.084333
Durbin-Watson stat	0.293624			
Equation 2:				
LOG(LABOR_MYANMAR) =				
constant	4.416029	0.270141	16.34715	0.0000
+ LOG(HDI_MYANMAR *POP_MYANMAR)	0.748408	0.015955	46.90673	0.0000
R-squared	0.990034	Mean dependent var		17.08008
Adjusted R-squared	0.989510	S.D. dependent var		0.122008
S.E. of regression	0.012496	Sum squared resid		0.002967
Durbin-Watson stat	0.205756			
Equation 3:				
LOG(OPEN_RATIO_MYANMAR) =				
constant	-14.02960	5.136404	-2.731404	0.0075
+LOG(ODA_ALL_MYANMAR(-1))	-0.239476	0.086679	-2.762784	0.0069
+ LOG(GDPR_CJKSTMIP)	0.897970	0.343671	2.612877	0.0104
R-squared	0.332845	Mean dependent var		-0.966047
Adjusted R-squared	0.269307	S.D. dependent var		0.339482
S.E. of regression	0.290192	Sum squared resid		1.768434
Durbin-Watson stat	0.845766			
Equation 4:				
LOG(CAPR_MYANMAR/GDPR_MYANMAR) =				
constant	-2.061124	0.561834	-3.668561	0.0004
*LOG(GDPR_CJKSTMIP(-1))	0.156502	0.057778	2.708702	0.0080
+ LOG(CAPR_MYANMAR(-1) /GDPR_MYANMAR(-1))	0.940561	0.128375	7.326666	0.0000
R-squared	0.933606	Mean dependent var		6.694433
Adjusted R-squared	0.925795	S.D. dependent var		0.127819
S.E. of regression	0.034819	Sum squared resid		0.020610
Durbin-Watson stat	0.619834			
Equation 5:				
LOG(HDI_MYANMAR) =				
constant	-0.946492	0.024245	-39.03813	0.0000
+ LOG(ODA_ALL_MYANMAR	-0.015410	0.006904	-2.232030	0.0279
+ [AR(1)=C(13),UNCOND,ESTSMPL="1990 2015"]	1.079936	0.015033	71.83541	0.0000
R-squared	0.990963	Mean dependent var		-0.712544
Adjusted R-squared	0.990102	S.D. dependent var		0.112483
S.E. of regression	0.011191	Sum squared resid		0.002630
Durbin-Watson stat	1.624263			
Determinant residual covariance		8.14E-16		

Note: 1) GDPR(j) is Real GDP of j-th country, j= CKMV, in general. While j=CJKSTMIP means summation of GDPR of China, Japan, Korea, Singapore, Malaysia, Indonesian and the Philippines respectively 2) RER(j), TT(j), CAPR(j), LABOR(j) and POP(j) are real exchange rate, Terms of trade, capital stock service and labor inputs and population of the j-th country 3) FDI(j) = Foreign direct investment in j-th FDI_GFCF(j) is FDI over gross fixed capital formation of country j-th 4) ODA_ALL = Official Development Assistant on net disbursement basis from all donors including Japan's ODA. 5) OPEN_RATIO = Trade Openness of the j-th country defined as total export plus import over GDP ratio. 6) HDI = Human Development Index of the UNDP. 7) Ds are dummy variables stand for the financial crisis and/or structural shift. 8) It is a rationale to interpret that Japan's ODA would have a positive macroeconomic impact in this manner. The substitution or/and complimentary of the macroeconomic impact between Japan's and Non-Japan ODA needs further analysis.