

# Impacts of Foreign Capital Inflows on Domestic Savings in 6 ASEAN Countries: A Panel Data Analysis

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## Abstract

This paper examines the impact of different categories of foreign capital inflows (FDI, Portfolio investment, and other investment) on domestic savings in 6 ASEAN countries, namely Indonesia, Malaysia, Philippines, Singapore, and Thailand, and Lao PDR. The study is conducted for two periods: 1990-2015, and 2000-2015 based on regression analyses utilizing Panel and Cross-section data of the selected ASEAN countries. The results show that foreign capital inflows at aggregate level displaces domestic savings. Of all categories of foreign capital inflows, only FDI has significantly positive impact on gross domestic savings rate in the two periods while short-term capital flows such as portfolio investment and other investment are not found to have any significant impact on domestic savings in the studied periods, and short-term capital flows show the increase in its volatile nature which is vulnerable to sustainable economic development. The results indicate the importance of trade liberalization, domestic financial development, and domestic investment to enhance domestic savings.

**Keywords:** Foreign capital; Domestic savings; FDI, ASEAN countries; Portfolio investment; Other investment.

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## Introduction

Past studies on the impact of foreign capital inflows on domestic savings in ASEAN have focused mainly on FDI, whereas study on the impact of short-term capital flows into this region is limited. Most of the studies emphasize on inflows of foreign capital, however, in terms of net inflows emphasis is limited. Therefore, the objective of this study is to investigate the impacts of foreign capital net inflows, in terms of both at aggregate and disaggregate levels, on gross domestic savings rate in 5 ASEAN countries, namely, Indonesia, Malaysia, Philippines, Singapore, and Thailand over the past 26 years between the year 1990 and 2015. This study further emphasizes on recent years since 2000, to reflect the fundamental changes in the sheer size and components of capital flows. This study is the first attempt to incorporate Lao PDR into the analysis of impacts of foreign capital inflows on domestic savings. This due to the country has also heavily relied on foreign capital inflows for economic development since the year the 2000s onward.<sup>2</sup>The data used is the latest data set to capture the current situation of capital flows as well as domestic savings and economies.

One of the key macroeconomic policies for most of developing and emerging and economies is to achieve sustainable economic growth. Theoretically, savings and investment are the two key intermediate macro variables playing an important role in economic growth. Therefore, there have been enormous studies on the relationship between savings, investment, and economic growth. Dated back to the (Harrod, 1939) and (Domar, 1946) growth model argued that saving is the main driving force for economic growth. Many economists have advocated its positive roles in the growth process irrespective of its origin whether it is mobilized domestically or coming from overseas.

During the 1990s, developing countries with higher self-financing ratios, which were financed by domestic savings without reliance on external borrowing, grew faster than those with the low self-financing ratio (Aizenman, Pinto, & Radziwill, 2007). Domestic savings is perceived to be a sustainable financing source for investment that if it is effectively mobilized and allocated to productive investment, sustainable economic growth would be attained. However, the development process of many developing and under-developed countries is constrained by insufficient domestic resources. Therefore, foreign savings are encouraged via unrestricted capital flows in forms of direct investment, portfolio investment, and loans, to meet up the two conventional gaps: investment-savings gap and export-import gap.

Since the 1980s, international capital movement, flows of capital from developed countries to emerging and developing countries, in particular, have sharply increased and impact of foreign shocks on emerging economies have become greater. In ASEAN region, the surge of foreign capital inflows began in in the early 1990s and ended abruptly with the Asian financial crisis triggering in 1997–98, while the second surge began in the early 2000s and again ended abruptly with the global financial crisis in 2008. During the 1990s, the ASEAN region has been the largest recipient of FDI, as well as short-term

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<sup>2</sup> Lao PDR is excluded from the 1990-2015 studied period is due mainly to the unavailability of the country's data on domestic savings, domestic investment, and domestic credit to private sector between 1990 and 1999.

capital inflows, relative to gross domestic product (GDP). In addition, as pointed out by (Montiel & Reihart, 1999) that the Asian financial crisis in 1997 was exposed to the increase in short-term capital flows or “hot money” owing to the policy response to the surge in capital inflows. The Asian financial crisis revealed that capital flows are volatile due primarily to short-term debt inflows, indicated by the sudden stop of short-term capital inflows (portfolio investment and other investment) followed by the massive outflow of the capital. Besides, FDI inflow also reduced during the years of crises hit.

The presence of substantial foreign capital flows may displace domestic savings/investment, resulting in high level of external reliance for economic development which may confront the countries with external shocks. Large short-term inflows lead to an investment boom in the equity and real estate markets and increase the fragility of the financial system. As can be seen during the crises hit, the sudden stop of capital inflows and massive capital flight, and decline in FDI inflow as well as portfolio investment, leading to the economic growth to plunge and income per capita fell.

Numerous studies have been conducted to investigate the effects of capital account liberalization on economic growth as well as on domestic savings. Empirical evidence pointed out the volatility capital flows that in recent years, capital flows influence procyclically on the economy of emerging countries, and foreign capital flows have a negative impact on domestic savings, especially small countries with capital and financial account liberalization. (OHTA, 2015), (Ocampo & Palma, 2008). Before the crisis hit, economic development which is fueled by short-term capital flows or “Hot Money”, is highly vulnerable to the crisis as pointed out by (Mishra, Mody, & Murshid, 2001) that more intense private capital flows are associated with the more intense crisis.

This is evidenced by the fact that these countries experienced during the 1990s, especially Thailand in which the 1997 crisis triggered and the country was severely hit, that the so call “bubble economy” was fueled by the voluminous inflow of short-term loans, as illustrated in figure 2.1 in appendix, which peaked at 9.8 percent of GDP in 1995, and then turned out to stop and followed by massive outflow with the net inflow marked -15.4 percent of GDP in 1998, resulting in the economic meltdown.

Moreover, although foreign capital inflows, especially long-term capital like FDI, have contributed to high economic performance in these countries, it is volatile and unsustainable financing source for development. As pointed out by (Rand & Tarp, 2002) that FDI inflows are very volatile. In the study, they assessed the relationship between FDI and output, the general relationship between the two variables was not found, indicating there is no connection between domestic investment and FDI. Indeed, they showed that FDI is much volatile than foreign aid flows. As such, they argued that stabilizing FDI is important to modify business cycle fluctuations. On the other hand, for the case of Lao PDR, the inflow of FDI has concentrated on capital intensive sector: mining and electricity generation, which has driven economic growth but not generated substantial employment in the country.

However, despite the massive inflows of foreign capital, domestic savings rate remain high especially in Singapore and Malaysia, which is attributed to the effective domestic

savings mobilization mechanisms through forced savings schemes such as the Central Provident Fund of Singapore and the Employee Provident Fund of Malaysia.

This paper has five remaining sections. Section I gives an overview of trends in foreign capital inflows, domestic savings, and economic growth of the 6 ASEAN countries. Section II is literature review on impacts of foreign capital inflows on domestic savings. Section III describes data and methodology. Section IV explains the results of statistical analysis on gross domestic savings rate, and the last section concludes this paper and gives policy recommendation.

## Literature Review

International capital movement from developed countries to emerging and developing countries, in particular, have sharply increased and impact of foreign shocks on emerging economies have become greater in the past two decades. The empirical studies conducted in the past may not fully explain the recent and current situation and impact of capital flows on domestic savings. Most of past studies emphasized on countries outside ASEAN region, for instance, studies conducted by (Weisskopf, 1972), (Okafor & Tyrowicz, 2010), (Angmortey & Offin, 2014), and (AFZAL, 2013). In addition, some studies that focused on ASEAN countries were also out of date which may not be applicable for the current situation, especially the current situation in the 6 ASEAN countries, and some emphasized on individual country such as studies conducted by (Boon, 2000), (Kiong & Jomo, 2005), (Ang, 2011), and (Tapphavitmol, 1984). Besides the impacts of foreign capital inflows, many studies have also investigate some other important factors affecting the domestic saving rate, for instance, the level of income, demographic factors, financial development, and some other relevant determinants as summarized in table 1 below.

This paper is different from the past studies in terms of evaluation of short-term capitals and relative long-term capital (FDI) that it emphasizes on net inflows of capitals during the most recent years in 6 ASSEAN countries to reflect the current situation and the influence of capital flows on domestic savings. Moreover, this study is the first attempt to incorporate Lao PDR into the analysis.

Table 1: Summary of Key Literature on Impacts of foreign capital flows and other determinants on domestic savings

Authors	Country/Country Group (Period)	Methods	Findings
(Boon, 2000)	5 ASEAN countries: Indonesia, Malaysia, Singapore, Thailand, Philippines (1968-1997)	Vector Error Correction Model (VECM)	<p>In short-run, it is not found that domestic savings contribute to investment for all the cases except Singapore. In contrast, investment causes the increase in domestic savings for the case of Indonesia and Thailand, instead. For the case of Malaysia and the Philippines, causal relationship between savings and investment is not found.</p> <p>The absence of short-run causality running from savings to investment was due to a high degree of short-run international capital flows in the region, meaning that the increase in investment in the region, especially Malaysia, the Philippines, and Thailand, during the boom period of 1988-1996 was contributed partially by the net inflow of foreign capital. For Singapore, the domestic saving is always surplus to the investment level since 1986, which indicates a net capital outflow from the country.</p>
(Kiong & Jomo, 2005)	Malaysia (1966-1996)	OLS	<p>Foreign capital inflow in aggregate and its components, i.e. external debt and FDI, had significantly negative impacts on the Malaysian domestic savings rate during 1966–96.</p> <p>However, although foreign capital inflows reduced the savings rate in Malaysia, it did not reduce the absolute savings level.</p> <p>The positive effect of foreign capital inflows on economic growth – suggested by conventional wisdom – was reduced due to the adverse effect of foreign capital on the domestic savings rate.</p>

Authors	Country/Country Group (Period)	Methods	Findings
(Weisskopf, 1972)	44 underdeveloped countries (1953-1966)	OLS	Foreign capital inflow has a negative impact on ex-ante domestic savings, but not necessary to the ex-post. On ex-ante domestic savings, foreign savings appear to displace domestic savings in under-developed countries.
(Delwar, 2014)	63 developing countries (1971-2010)	CCEMG estimation	Of all foreign capital, only remittances crowd out domestic savings while other foreign capital flows are not found to have any significant impact on domestic savings.
(Katircioglu & naraliyeva, 2006)	Kazakhstan(quarterly data for 1993-2002)	Granger Causality test, VAR, and VECM	No co-integration between FDI and domestic savings, but both led economic growth. In long-run, the increase in of 1% of domestic savings and FDI contribute to the increase in real income by 0.28% and 0.62% respectively.
(Agrawal, Sahoo, & Dash, 2009)	5 South Asian countries (1975-2010)	Panel cointegration(FMOLS)	Main determinants of domestic savings rate are the growth rate of income per capita, accessing to banking institutions, foreign savings rate, have a positive impact on domestic savings, while dependency ratio and the availability of foreign savings are negatively related to domestic savings rate. Besides, the real interest rate has a minor impact, and its impact is inconclusive.
(Adeniyi & Egwaikhide, 2013)	20 Sub-Saharan African Countries(1976-2005)	Multiple regression of panel data with Fixed-effects estimation	Financial development, especially domestic credit provided to private sector plays important role in mobilizing domestic savings for investment. Additionally, domestic credit to private sector has positively affected domestic investment, resulting in the increase in domestic savings. The results imply the role of financial development in mobilizing domestic savings for investment.

Authors	Country/Country Group (Period)	Methods	Findings
(Okafor & Tyrowicz, 2010)	38 countries of Latin America and The Caribbean, and 48 Sub-Saharan African countries(1975-2004)	Panel data with Fixed and Random Effects estimations	The negative link between foreign debts and domestic savings, especially in the long run that 1% increase in foreign borrowing, domestic savings rate reduces by 7.8%. A large amount of foreign debt associated with debt service payment hamper economic development and discourage domestic private savings in developing countries. It is also found that FDI has a positive impact on domestic savings contemporaneously and in the medium term, whereas in long-run, it has a negative impact on domestic savings.
(Odhiambo, 2009)	South Africa(1950-2005)	Multivariate Causality test	Foreign capital inflows and savings Granger- cause each other, however, the growth of real sector drives up the accumulation of savings in the long run.
(Hyung, 2013)	15 high-income countries (1975-2010)	Pooled OLS, panel data with Fixed and Random Effects estimations	Old age dependency ratio has no significant impact on the domestic saving rates, while GNI per capita is found to have statistically significant effect on domestic savings. Elderly do not earn at the old-age, but spend their accumulated income for living, whereas the higher income level encourages capacity to save, hence contributes to the increase in the savings rate.
(Collins, 1991)	10 developing countries (1960-84)	OLS	Countries that have high saving rates are those with high economic growth rate and lower young age dependency ratio. Sine household with more number of children spends more on consumption, hence discourages savings.
(Ang, 2011)	Malaysia (1960-2007)	ARDL and DOLS	It is found that financial deepening and increased banking density tend to encourage private savings in Malaysia. However, financial system liberalization and development of insurance markets tend to discourage private savings.

Authors	Country/Country Group (Period)	Methods	Findings
(Sung & Young, 2005)	Korea (1975-2002)	Life-cycle hypothesis test	Income growth positively affects the aggregate saving rate, whereas, young and the older age dependency ratios have negative effects on the saving rate. On the other hand, it is found that foreign saving substitutes domestic saving
(Horioka & Terada-Hagiwara, 2012)	twelve economies in Developing Asia (1966-2007)	Panel data based on Multiple regression with Fixed Effects estimations	The main determinants of domestic saving rates in Developing Asia are age structure of the population (especially the aged dependency ratio), income levels, and the level of financial sector development, and that the impacts of income levels and the level of financial sector development. In long-run, the negative impact of population aging on domestic savings will be offset by the positive impact of higher income level.
(OHTA, 2015)	21 OECD and Emerging Economies (1975-2013)	OLS estimation	Foreign capital flows have a negative impact on domestic savings, especially small countries with capital and financial account liberalization.
(Osoian, Lazar, & Zaharie, 2008)	10 Eastern Europe economies: Czech Republic, Hungary, Poland, Slovak Republic, Slovenia, Bulgaria, Romania, Estonia, Latvia, and Lithuania (1986-2006)	Panel data based on Fixed Effects estimations	Current account balance, as a proxy of financial liberalization, does not substitute domestic savings. This due to these transition economies had limited access to international capital markets. The results revealed that income level is the most important factor contributing to domestic savings that the higher the income level, the higher domestic savings level.
(Angmortey & Offin, 2014)	Ghana: Quarterly data (1983-2012)	Cointegration technique, ECM	Foreign capital has positively correlated with real domestic savings in the long run, although not steady but volatile. In short-run, foreign capital is not found to have any significant effect on real domestic savings. The three components of foreign capital do not displace domestic savings both in the short-run and the long-run. The results suggested that FDI is to be more emphasized by improving the locational

Authors	Country/Country Group (Period)	Methods	Findings
			advantages. On one hand, the capital market should be strengthened to provide an avenue for investing the retained earnings of firms in order to prevent capital flight.
(Tapphvimol, 1984)	Thailand (1970-1984)	2SLS method	Foreign aid had a significantly negative effect on domestic savings. This might be due to the fact that foreign aid is negotiated on a government to government basis, and it is possibly due to the government of the recipient country may tend to relax its efforts in mobilizing domestic resources once large commitments of foreign aid from external sources is found. In addition, it is also found that short-term capital flow had negatively affected domestic savings whereas it positively affected economic growth.
(Mohamed , 2003)	Egypt (1970-1995)	OLS	Foreign capital flows are not found to displace domestic savings level of Egypt, in fact, the low domestic savings of the country may probably due to other factors and not foreign capital inflow, for instance, it might be due to government failure in generating large savings.
(AFZAL, 2013)	Pakistan (1960 -2010)	Granger Causality test	No causality is found from foreign capital to savings, but for the whole period (1960-2010), it is found that domestic savings cause foreign capital; and for 1973-90 periods, both foreign capital and domestic savings caused each other. During the recent period, 1990-2010, there is no causality between foreign capital and savings, but savings Granger-cause foreign capital in periods. The results suggested that foreign capital is not a permanently dependable source for investment, and Pakistan should rely on its own savings.

## Data and Methodology

### Data

Domestic savings and investment in the 6 ASEAN countries over the past 26 years vary across countries. As indicated in the table 2 below, Singapore and Malaysia are the countries having high domestic savings rate, especially Singapore that has the highest domestic savings rate which exceeds investment rate throughout the 1990-2015 period. The high savings rates of the two countries attributed to the domestic savings mobilization mechanism through compulsory savings schemes. In contrast, Laos and Philippines are the countries with lowest domestic savings rates compared to other countries, and investments exceed savings.

It is also shown in the table that investment level of the ASEAN countries was relatively high during the 1990s while in the recent periods, since the 1997 crisis, investment has declined. The high investment level in the 1990s was due mainly to substantial inflows of FDI in the period, especially before the Asian financial crisis. For the case of Lao PDR, domestic investment, especially since the 2004, domestic investment has surged due to the large influx of FDI in mining and electricity generation.

Table 2: Gross Domestic savings and investment, % of GDP

Country		1990-1999	2000-2009	2010-2015
<b>Indonesia</b>	Savings	28.15	25.47	31.93
	Investment	28.39	25.00	33.98
<b>Malaysia</b>	Savings	40.65	36.30	36.01
	Investment	42.98	26.87	24.73
<b>Philippines</b>	Savings	15.89	16.05	16.19
	Investment	22.73	20.23	20.05
<b>Thailand</b>	Savings	35.40	30.31	30.75
	Investment	36.46	24.95	25.98
<b>Singapore</b>	Savings	49.34	48.88	53.64
	Investment	34.65	25.38	28.37
<b>Laos</b>	Savings	N/A	12.73	17.90
	Investment	N/A	23.47	29.14

Source: World Bank/World Development Indicators 2016

*Gross domestic savings (per cent of GDP) is the dependent variable of this study, it is calculated as GDP less final consumption.*

*Real GDP per capita growth rate which is based on local currency constant price, is one of the independent variables in this study. This variable is the proxy for income level that without GDP growth, income level cannot increase.*

*Foreign capital net inflows*, both net inflow of total capital and the disaggregated capital net inflows which consist of three major classifications of capital inflows (in accordance with the categorization of the IMF BOP data), such as FDI, portfolio investment, and other investment, are the main explanatory variables in this study. The net capital flow variables are calculated as inflows minus outflows, which account for the exact amount of the capital available for investment in the country.

Among the foreign capital flows, *FDI* is likely to contribute to domestic savings rate. This is due to FDI may enhance capital formation and employment augmentation, promote manufacturing exports, bring special resources such as capital, managerial skills, knowledge flows and others, and results in technology and spillover effects. In addition, these ASEAN countries have substantially relied on FDI for economic development, especially during the Pre-Asian crisis years. Therefore, it is expected to have a positive sign of its coefficient.

The other types of foreign capital are short-term capital: *portfolio investment and other investment*. Other investment includes loans, the financial transaction in currency and deposit, and trade credit and advances. Both equity portfolio investment and other investment are volatile in their nature since they are easily reversible and sensitive to fluctuations in expected risk-adjusted in international yield differentials. Therefore, the coefficients of this variable are expected to have negative signs.

*Gross capital formation or gross domestic investment* as measured by the percentage of GDP, is an explanatory variable of the domestic savings rate. With more reliance on domestic investment, it would be the promising way to attain sustainable economic growth and domestic savings, thus the coefficient of domestic investment is expected to have a positive sign.

*Domestic credit to the private sector by banks*, which is a proxy of financial development as the share of GDP, is the financial support provided to the private sector. Since domestic credit is derived from tapping domestic private sector, the increase in domestic banks' credit to private sector enhances domestic investment level and income generation, hence, accelerates economic growth and increase in income and savings level. Therefore the coefficient of domestic credit to the private sector is expected to have a positive sign.

*Trade openness*, which is the sum of export and import value as the percentage of GDP; the increase in trade openness can result in magnified gains owing to large knowledge spillovers, the greater level of competition, product variety and technology transfer. Higher exports increase real output while higher imports mitigate production cost. According to the comparative advantage theory, international trade leads to a more efficient use of a country's resources through the imports of goods and services that otherwise are too costly to produce domestically. In addition, as trade openness increase, especially the expansion of the export stimulates productivities by creating scale economies and increases foreign exchange earnings which provide greater access to the international markets (Krugman, 1997), (Esfahani, 1991).

*Initial mean years of schooling of the population aged 15 and above* as a proxy for human capital, is one of the explanatory variables in domestic savings regression. With higher education level, domestic savings is enhanced. The more educated population encourage the high level of financial literacy, resulting in more likely to access to formal financial services, leading to the increase in domestic savings level. Thus, the coefficient is expected to have a positive sign.

*The dummy variable for Lao PDR* is also included in the analysis for the 2000-2015 period. The dummy variable captures the influence of the country's specific factor which may have a significant impact on savings rate in panel data analysis. Since the country has very much different characteristics compared to the other ASEAN countries, and it is the country which has lowest domestic savings rate, and investment level exceeds savings level throughout the studied period, and FDI in this country has been observed to have impact on the economy as well as on domestic savings since the late 2000s. Therefore, the coefficient of the dummy variable is expected to have a negative sign.

### *Methodology*

Before the 1990s, capital flows to these ASEAN countries were not significant until the early 1990s. Since 1990, flows of foreign capital into these countries has increased remarkably, especially in 1997, and since then the inflows show declining trend particularly since the 2000s. Therefore, this paper analyzes the impact of foreign capital inflows and other observed factors on gross domestic savings rate for two periods: 1990 to 2015, and 2000 to 2015 periods.

Due to the situation of domestic savings of these studied countries and the flows of foreign capital are different, especially before and after the Asian financial crisis. On the other hand, due to the data limitation for Lao PDR, in the 1990s in particular, the country is excluded from the analysis for the 1990-2015 period. Besides, the country has substantially relied on foreign capital inflows, especially FDI since the year 2000 onward, and loans to meet investment requirement of the country. During the recent five years, the country has also received the inflow of portfolio investment, stemming from the year 2010 when the Lao Stock Market was inaugurated.

Analyses based on multiple regression, utilizing panel and cross-section data of the selected ASEAN countries, are conducted. In the regression analyses, fixed effect of each explanatory variable will be examined. In Panel analysis, the term fixed effects estimator is used to refer to an estimator for the coefficients in the regression model. If we assume fixed effects, we impose time-independent effects for each entity (country in this study) that are possibly correlated with the regressors. The fixed effect assumption is that the individual specific effect is correlated with the independent variables. By using the fixed effects method, it is possible to control for all possible characteristics of the Individual country in the study, thereby eliminating potentially large sources of bias even without measuring them, so long as those characteristics do not change over time. In a fixed effects model, the intercept varies across countries. For the 2000-2015 period, the country dummy variable for Lao PDR is included in the regressions to capture the influence of this country specific effect on gross domestic savings rate (as shown in equation 2).

Some explanatory variables are highly correlated. As shown in table 5 in the appendix, domestic credit to the private sector is highly correlated with total foreign capital inflow, domestic savings rate, and trade openness, with correlation degree of 0.609, 0.787, and 0.670, respectively. Therefore, to avoid multicollinearity problem, these variables are in the separate run.

The models for the two studied periods are specified as follows:

1). Domestic savings model for the 1990-2015 period:

$$DS_{it} = \alpha_i + \beta_1 GDP\_Gr_{it} + \beta_2 Schl\_YEARS_i + \beta_3 Domestic\_INV_{it} + \beta_4 FC_{it} + \beta_5 TR_{it} + \beta_6 CR_{it} \quad (1)$$

2). Domestic savings model for the 2000-2015 period:

$$DS_{it} = \alpha_i + \beta_1 GDP\_Gr_{it} + \beta_2 Schl\_YEARS_i + \beta_3 Domestic\_INV_{it} + \beta_4 FC_{it} + \beta_5 TR_{it} + \beta_6 CR_{it} + \beta_7 D_{LAO} + \mu_{it} \quad (2)$$

Where:  $i$  ( $i=1 \dots N$ ) denotes the country, and  $t$  ( $t=1 \dots T$ ) denotes time (year)

$\alpha$ : time-invariant country-specific effects

$DS$ : gross domestic savings rate as the dependent variable.

$GDP\_Gr$ : real GDP per capita growth rate

$Domestic\_INV$ : gross domestic investment rate

$FC$ : the vector of foreign capital net inflows which consists of total foreign capital inflows (TFC), foreign direct investment (FDI), Portfolio investment (Portfolio), and Other investment (OTHER)

$TR$ : trade openness

$CR$ : domestic credit to private sector by banks

$Schl\_YEARS$ : Initial mean years of schooling of the population aged 15 and above. The data referred to average years of schooling in the year 1990 for the 1990-2015 period, and the year 2000 for the 2000-2015 period.

$D_{LAO}$ : dummy variable for Lao PDR (it takes the value 1 if the country is Lao PDR, and 0 otherwise)

$\mu$  is the error term

## Results and Discussion

Table 3 shows the regression results from balanced panel data for the 1990-2015 period. Regression results the 2000-2015 period are shown in table 4 for 5 countries, in table 4.1 for 6 countries including Laos. The gross domestic savings rate is regressed by

foreign capital net inflows, real GDP per capita growth rate, domestic investment, financial development, trade openness, and initial level of human capital. The lagged effects of foreign capital inflows at the aggregate level and FDI are also incorporated in the regressions based on the fact that foreign capital, especially long-term investment like FDI may take years to have an effect on the economy as well as on domestic savings. The variables are two-year lagged based on Var Lag Order Selection Criteria that the Akaike Information Criterion (AIC) value is smallest for 2-year lagged (20.1959) compared to 1 lag (AIC=20.4393). The nature of each variable in the regressions and the results are to be presented as follows:

### *Total foreign capital net inflows*

As indicated in column 3 of table 3, and in table 4 and 4.1 (column 3 and 3.1 of table 4 and 4.1, respectively), at the aggregate level, the net inflow of total foreign capital is negatively correlated with gross domestic savings rate both during the 1990-2015 and 2000-2015 periods. The coefficient is significant at 10 percent level for the 1990-2015 period while it becomes more significant, at 5 percent level during the recent period (2000-2015), and its lagged effect is even more significant (at 1 percent level) when incorporating Lao PDR in the regression. This implies that foreign capital inflows displace domestic savings, and especially for the case of low savings country like Lao PDR that relied largely on foreign borrowing for investment, the availability of foreign funds crowds out domestic savings.

### *FDI*

After controlling for other determinants of domestic savings, the findings shown in column 4 of table 3 (1990-2015 period) and column 4 and 4.1 in table 4 and 4.1 for the 2000-2015 period, indicate that FDI is positively correlated with gross domestic savings rate, especially in the recent period. In the entire studied period, 1990-2015, FDI is not found to have any significant contribution to domestic savings rate, whereas in the recent period, 2000-2015, it significantly affects domestic savings rate. The reason why FDI is significantly correlated with domestic savings in this period is that Laos may be a large factor which affected large scale investment in mining sector and infrastructures.

On one hand, the insignificant correlation between FDI and domestic savings during the 1990-2015 period is might be due to the fact that these countries attracted FDI by offering incentives to foreign investors, especially the liberal regulations on income repatriation which is considered as an incentive for foreign investor that repatriation of investment income was easy to be transferred out or repatriated to the home country; after the Asian Financial Crisis hit in 1997, many countries introduced capital control by limiting the capital outflows, for instance, Malaysia imposed capital control on currency in September 1998 to prevent outflow of the national currency in the open market, resulting in non-internationalized of the Ringgit and traveler must declare to central bank in case of taking out money that exceeds RM 10,000 out of the country; therefore, after the crisis, during 2000-2015 period in particular, the investment income are not freely repatriated, leading to more funds retained in the country, resulting in the greater positive impact of FDI on domestic savings rate.

However, it should be noted that during the Asian financial crisis, despite the insignificant positive effect of FDI on domestic savings, the domestic savings rate was also high, especially in Singapore and Malaysia. This due to the fact that these two countries have effective domestic savings mobilization mechanisms through compulsory savings schemes such as the Central Provident Fund of Singapore and the Employee Provident Fund of Malaysia.

### *Portfolio Investment*

As shown in column 5 of table 3, and in table 4 and 4.1, portfolio investment is not observed to have any significant impact on gross domestic savings rate in the two studied periods. The results are in line with (Sung & Young, 2005) and (Delwar, 2014). In fact, the results in table 3 and 4.1 show that portfolio investment tends to reduce domestic savings rate, indicating the availability of foreign savings discourage domestic savings.

### *Other Investment*

Regression results are shown in column 6 of table 3, and in table 4 and 4.1, indicate that other investment is negatively correlated with the gross domestic savings rate in the two studied periods, but the coefficient is insignificant. The results in column 6 and 6.1 of table 4 and 4.1 show that in the recent period, the negative impact of other investment or loans, which is short-term capital flows (less than one year), is greater than that of in the 1990-2015 period, implying the reliance on foreign borrowing increases vulnerability of the country to confront with external risk, also, as pointed out by (Phimmavong, 2017) that negative effect of other investment on economic growth in the recent period (2000-2015) indicates the increase in its volatility in relation to short-term capital flows.

### *Real GDP per capita growth rate*

Real GDP per capita growth is found to have significantly positive impact on gross domestic savings rate during the 1990-2015 period, with significant level of 10 percent (as shown in column 4, 5, and 6 of table 3), whereas the impact becomes insignificant during the recent period (see column 4 through 6 of table 4, and column 4.1 through 6.1 in table 4.1). This could be due to the fact that economic growth rate of these ASEAN countries in the recent period, except for the case of Lao PDR, has slowed down and fluctuated dramatically, and also might be due to the growth volatility in relation to short-term capital flows.

### *Domestic Investment*

As indicated in column 1 and 2 of table 3, and column 1 and 2 of table 4 as well as column 1.1 and 2.1 of table 4.1, domestic investment is highly positive correlated with domestic savings with 1 percent significant level in the two studied periods. Theoretically, savings equals to investment, and if the domestic fund is effectively mobilized and allocated to domestic investment to create employment opportunities, income level will increase, resulting in the increase in the domestic savings rate. Promoting domestic investment is a more promising way to enhance sustainable economic growth and raise

domestic savings level as the investment income remains in the country, whereas relying on foreign investment leading to the repatriation of the profit which reduces the availability of domestic savings.

### *Financial development*

As a proxy of financial development variable, domestic credit to the private sector by banks is found to have a significantly positive effect on domestic savings rate in the two studied periods. The findings are in line with (Adeniyi & Egwaikhide, 2013) and (Agrawal, Sahoo, & Dash, 2009) that financial development, especially domestic banks' credit to private sector plays an important role in mobilizing domestic savings for investment.

### *Trade Openness*

Trade openness which is the sum of import and export, as indicated in column 2 of table 3, and column 2 of table 4 and column 2.1 of table 4.1, trade openness has a positive effect on domestic savings in the two studied periods, with 1 percent significant level. The positive impact of trade on domestic savings in the recent period is greater than that of in the 1990-2015 period, indicating the importance of trade liberalization, especially promoting export as a source of foreign exchange earnings which contributes to the increase in the savings rate.

### *Initial level of human capital*

As indicated in column 1 of table 3, and column 1 and 1.1 of table 4 and 4.1 respectively, average years of schooling at the initial year, as a proxy of human capital, is positively correlated with gross domestic savings rate for both the 1990-2015 and the 2000-2015 periods. Results in column 7 and 7.1 of table 2.1 indicate that in the recent period, the positive impact of education, average years of schooling, in particular, become greater than that in the 1990-2015 period, indicating the more educated population leads to more likely to access to formal financial services.

In sum, the empirical results of this study show that among the types of foreign capital inflows, only FDI is found to have significantly positive impact on domestic savings in the 6 ASEAN countries, both during 1990-2015 and 2000-2015 periods, whereas portfolio investment is not found to have any significant impact on gross domestic savings rate.

In fact, the short-term capital inflows tend to displace domestic savings, and short-term capital flows are more volatile and reversible compared to long-term capital flow such as FDI. The case of Lao as a small economy, where foreign capital flows have put much effects on the domestic market and economy, through volatile short-term capital investment, especially largely dependent on public and publicly-guaranteed loans<sup>3</sup>. The

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<sup>3</sup> According to data from ADB/Key Indicators for Asia and the Pacific 2016, the country's external indebtedness is 120 percent of GDP per year during the 2000 and 2014, which is the highest among ASEAN countries.

country's large-chronic current account deficit which mainly due to trade deficit causing low foreign reserves, is financed by official grants and loans from abroad. Furthermore, the inflow of FDI into this country, though contributes to the high growth rate of its GDP, it skews to the excavation of natural resources, whereas more than three third of the country's population are engaging in subsistent agriculture.

In contrast, short-term capital inflows such as other investment or short-term loans indicates more volatile capital flows in the selected ASEAN countries. Reliance on foreign capital inflows, especially short-term capital which is evidenced by the years before 1997 crisis, confronts the countries with financial crisis leading to economy shrinking. However, in the later period, despites the increase in international financial integration, impact of global financial crisis triggering in 2008 on the countries is less than that of the 1997 crisis due to capital controls. On the other hand, domestic investment and domestic credit to the private sector by banks are found to have positively correlated with gross domestic savings rate during the 1990-2015 and the 2000-2015 periods, and the effects of domestic investment become more significant in the recent period. This signifies the effective domestic savings mobilization and allocation to productive investment to be promoted in order to raise income level and domestic savings level.

It should be noted that financial sector's activities, including bank lending, may not always correspond with domestic investment since several countries are mobilizing imported capital through capital inflows directly. In addition, there are disparities in domestic banks' credit to private sector between among these countries. Those highly developed financial sector countries such as Singapore, Malaysia, and Thailand, despites the increasing trend in banks' credit to private sector, the domestic investment has stagnated in the countries, and even decline in recent few years, implying domestic savings are not allocated to investment to boost economic growth. Moreover, among the 6 ASEAN countries, during the 2000 and 2015 period, Indonesia and Lao PDR are the countries which domestic investment, as the share of GDP, exceeds the level of domestic credit to the private sector by banks, implying heavily reliance on foreign borrowing which is vulnerable to sustainable development.

Trade openness is an insignificant factor contributing to the increase in the domestic savings rate in the two sample period. With the higher level of trade liberalization, especially export, income level will increase, leading to the increase in capacity to save.

Finally, the initial human capital as measured by mean years of schooling of the population aged 15 and above, is an important factor contributing to the increase in domestic savings. Thus promoting education would be one of the promising ways to raise domestic savings rate that education leads to the higher level of financial literacy of population and results in the increase in access to formal financial services as well as the savings level.

Table 3: Regression results of 5 countries (1990-2015)

Explanatory variables	Dependent Variable: Gross domestic savings rate, % of GDP					
	1	2	3	4	5	6
Domestic investment	1.4936*** (0.1878) (7.9523)	0.3175*** (0.0779) (4.0783)	-	-	-	-
Total Foreign Capital	-	-	-0.1754* (0.0939) (-1.8680)	-	-	-
lagged Total Foreign Capital	-	-	0.0627 (0.0932) (0.6730)	-	-	-
FDI	-	-	-	0.0311 (0.1281) (0.2480)	-	-
lagged FDI	-	-	-	0.1283 (0.1225) (1.0477)	-	-
Portfolio Investment	-	-	-	-	-0.0203 (0.0659) (-0.3083)	-
Other Investment	-	-	-	-	-	-0.0455 (0.0616) (-0.7389)
Trade Openness	-	0.0477*** (0.0175) (2.7341)	-	-	-	-
Credit to private sector	-	-	-	0.1344*** (0.0296) (4.5399)	0.1551*** (0.0253) (6.1421)	0.1521*** (0.0256) (5.9410)
Initial mean years of schooling	3.1452*** (0.8025) (3.9036)	-	-	-	-	-
GDP per capita growth	-	-	0.1043 (0.1597) (0.6532)	0.2563* (0.1518) (1.6890)	0.2397* (0.1323) (1.8112)	0.2377* (0.1321) (1.8000)
Constant term	-26.3796 (8.0051) (-3.2954)	17.1648*** (3.7312) (4.6004)	32.4436*** (0.7925) (40.9381)	21.4847*** (2.4761) (8.6769)	20.4360*** (2.0917) (9.7703)	20.6848*** (2.1144) (9.7828)
R <sup>2</sup>	0.4017	0.9357	0.9357	0.9477	0.9443	0.9446
No. observations	130	130	120	120	130	130

*Note:* Figures in Parenthesis are standard errors (upper), t-statistic (lower). \* denotes significance level at 10%, \*\* at 5%, and \*\*\* at 1%.

*Countries included:* Indonesia, Malaysia, Philippines, Thailand, and Singapore

Table 4: Regression results of 5 countries (2000-2015)

Explanatory variables	Dependent Variable: Gross domestic savings rate, % of GDP					
	1	2	3	4	5	6
Domestic investment	1.8093*** (0.2574) (7.0301)	0.3544*** (0.1104) (3.2104)	-	-	-	-
Total Foreign Capital	-	-	-0.3748** (0.1600) (-2.3423)	-	-	-
lagged Total Foreign Capital	-	-	0.0944 (0.1298) (0.7276)	-	-	-
FDI	-	-	-	0.1625 (0.2005) (0.8104)	-	-
lagged FDI	-	-	-	0.4019** (0.1608) (2.4995)	-	-
Portfolio Investment	-	-	-	-	0.0175 (0.0899) (0.1949)	-
Other Investment	-	-	-	-	-	-0.0701 (0.0766) (-0.9154)
Trade Openness	-	0.0792*** (0.0212) (3.7362)	-	-	-	-
Credit to private sector	-	-	-	0.0497 (0.0819) (0.6065)	0.1553** (0.0696) (2.2308)	0.1426** (0.0698) (2.0430)
Initial mean years of schooling	4.8880*** (0.6123) (7.9832)	-	-	-	-	-
GDP per capita growth	-	-	-0.2069 (0.2400) (-0.8622)	0.0908 (0.2524) (0.3595)	0.1974 (0.2244) (0.8800)	0.1734 (0.2233) (0.7763)
Constant term	-47.8527 (8.9114) (-5.3698)	11.2704 (4.2662) (2.6418)	32.0386*** (1.5050) (21.2878)	28.2975 (6.4150) (4.4111)	20.7921 (5.5371) (3.7550)	21.6180 (5.5459) (3.8980)
R <sup>2</sup>	0.5908	0.9601	0.9515	0.9542	0.9466	0.9473
No. observations	80	80	70	70	80	80

*Note: Figures in Parenthesis are standard errors (upper), t-statistic (lower). \* denotes significance level at 10%, \*\* at 5%, and \*\*\* at 1%.*

*Countries included: Indonesia, Malaysia, Philippines, Thailand, and Singapore*

Table 4.1: Regression results of 6 countries (2000-2015)

Explanatory variables	Dependent Variable: Gross domestic savings rate, % of GDP					
	1.1	2.1	3.1	4.1	5.1	6.1
Domestic investment	1.4954*** (0.2056) (7.2730)	0.7775*** (0.1327) (5.8603)	-	-	-	-
Total Foreign Capital	-	-	-0.4942** (0.2360) (-2.0939)	-	-	-
lagged Total Foreign Capital	-	-	-0.7866*** (0.2495) (-3.1525)	-	-	-
FDI	-	-	-	0.9404*** (0.2876) (3.2698)	-	-
lagged FDI	-	-	-	0.5797* (0.2903) (1.9971)	-	-
Portfolio Investment	-	-	-	-	-0.0070 (0.0864) (-0.0806)	-
Other Investment	-	-	-	-	-	-0.2413 (0.1800) (-1.3400)
Trade Openness	-	0.0849*** (0.0054) (15.8287)	-	-	-	-
Credit to private sector	-	-	-	0.1925*** (0.0242) (7.9694)	0.1476** (0.0683) (2.1624)	0.2332*** (0.0250) (9.3356)
Initial mean years of schooling	4.6644*** (0.5739) (8.1272)	-	-	-	-	-
GDP per capita growth	-	-	0.5076 (0.5434) (0.9341)	0.0729 (0.4696) (0.1553)	0.1411 (0.2165) (0.6517)	0.5243 (0.4712) (1.1127)
Dummy variable: Laos	-5.0204 (2.8945) (-1.7345)	11.7947*** (1.5928) (-7.4049)	0.6267 (3.3222) (0.1887)	-9.2608*** (2.6983) (-3.4321)	-	-4.6123 (2.8738) (-1.6050)
Constant term	-38.4169 (7.4735) (-5.1404)	-0.1591 (3.3439) (-0.0476)	22.3763*** (2.5052) (8.9320)	15.9913*** (2.6863) (5.9529)	20.8439 (5.2428) (3.9757)	13.1915*** (2.7205) (4.8490)
R <sup>2</sup>	0.6821	0.8612	0.6773	0.7691	0.9492	0.9960
No. observations	96	96	84	84	86	96

**Note:** Figures in Parenthesis are standard errors (upper), t-statistic (lower). \* denotes significance level at 10%, \*\* at 5%, and \*\*\* at 1%.

**Countries included:** Indonesia, Malaysia, Philippines, Thailand, Singapore, and Lao PDR (For Lao PDR, Portfolio investment data is not available from 2000 to 2009)

## Concluding Remarks

The analyses on the effects of capital flows on domestic savings based on panel for 5 ASEAN countries (Indonesia, Malaysia, Philippines, Thailand, and Singapore) over the past 26 years from 1990 to 2015, and 6 countries (Indonesia, Malaysia, Philippines, Thailand, Singapore, and Lao PDR) during the past 16 years between the year 2000 and 2015. Regression analyses based on Panel Fixed-Effects estimation, show that foreign capital inflows at aggregate level displace domestic savings, especially in the recent period (2000-2015). Among the types of foreign capital inflows, only FDI is found to have significantly positive impact on domestic savings rate of the 6 ASEAN countries, both during 1990-2015 and 2000-2015 periods, and the impact in the recent period is less than that in the 1990-2015 period owing to the imposition of capital control measures after the 1997 financial crisis, resulting in the repatriation of investment income of foreign investors that it is no longer easily repatriated to the home country; whereas short-term capital inflows such as portfolio investment and other investment are not found to have any significant impact on gross domestic savings rate, in fact, short-term capital inflows tend to have negative impact on domestic savings. However, even though FDI has a significantly positive correlation with gross domestic savings rate, and appears to be more stable compared to the short-term capital due to its sunk cost nature, a past study showed that FDI is also volatile and its volatility is much higher than foreign aid flows.

In contrast, short-term capital inflow such as other investment or short-term loans indicates the increase in its volatile nature. Reliance on foreign capital inflows, especially short-term capital which is evidenced by the years before 1997 crisis, confronts the countries with financial crisis leading to the economy shrinking and unstable domestic savings due to the sudden stop of capital flows accompanied by the massive outflows of capital. However, in the later period, despite the increase in international financial integration, the impact of global financial crisis triggering in 2008 on the countries is less than that of the 1997 crisis due to capital controls.

On the other hand, domestic investment and domestic credit to the private sector by banks are found to have positively correlated with gross domestic savings rate during the two sample periods, indicating the importance of developing the domestic financial sector and promoting domestic investment as well as the promotion of education for ordinary people.

For the case of Lao as a small economy, where foreign capital flows have put much effects on the domestic market and economy, through volatile short-term capital investment, especially largely dependent on public and publicly-guaranteed loans<sup>4</sup>. The country's large-chronic current account deficit which mainly due to trade deficit causing low foreign reserves, is financed by official grants and loans from abroad, which is vulnerable to sustainable development.

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<sup>4</sup> According to data from ADB/Key Indicators for Asia and the Pacific 2016, the country's external indebtedness is 120 percent of GDP per year during the 2000 and 2014, which is the highest among ASEAN countries.

These stylized facts suggest the importance of promoting domestic investment by effectively supporting domestic credit to private sector to finance productive investment in prioritized areas and sectors in order to attain sustainable economic growth and stable domestic savings mobilization. Besides, in the context of increasing global competition for FDI, developing countries should formulate policies to improve local skills and their human capital as to enhance the countries' absorptive capacity to reap benefit from FDI as well as to improve the quality of FDI that a country can attract.

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**APPENDIX**

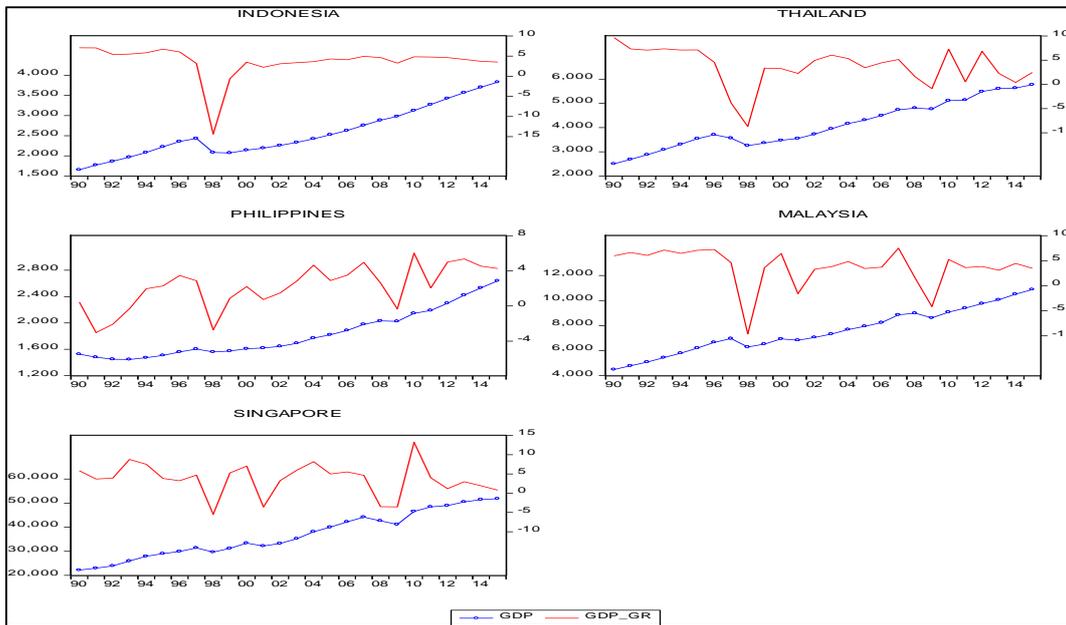


Figure 1.1: GDP per capita (Left axis, \$US 2010 price), and growth rate (right axis, %), 1990-2015

Source: WB/World Development Indicators 2016

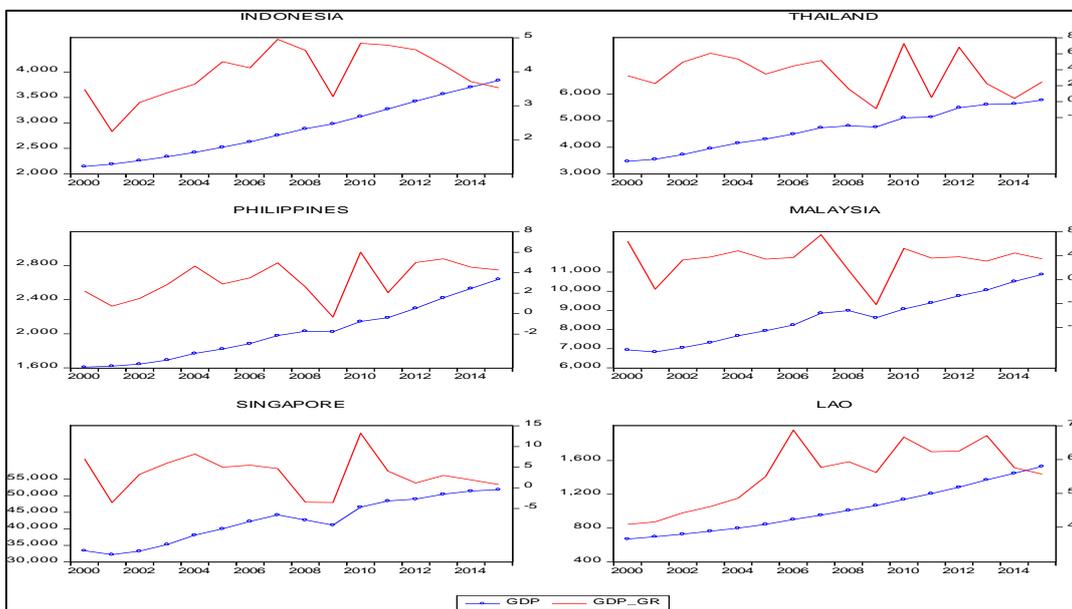


Figure 1.2: GDP per capita (Left axis, \$US 2010 price), and growth rate (right axis, %), 2000-2015

Source: WB/World Development Indicators 2016

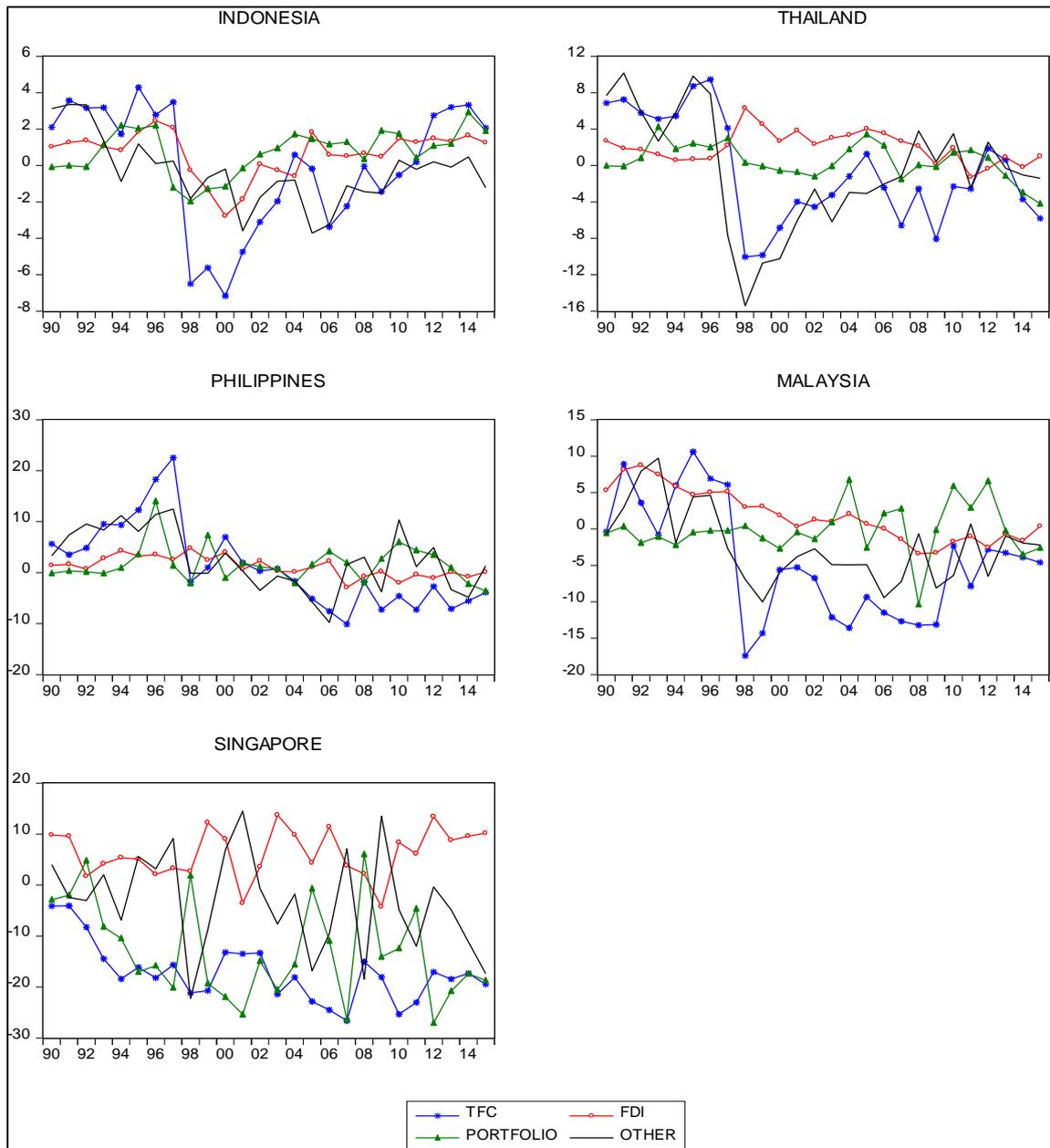


Figure 2.1: Average Foreign capital net inflows (1990-2015), % of GDP

Source: Author's calculation based on data from IMF/IFS and WB/World Development Indicators 2016

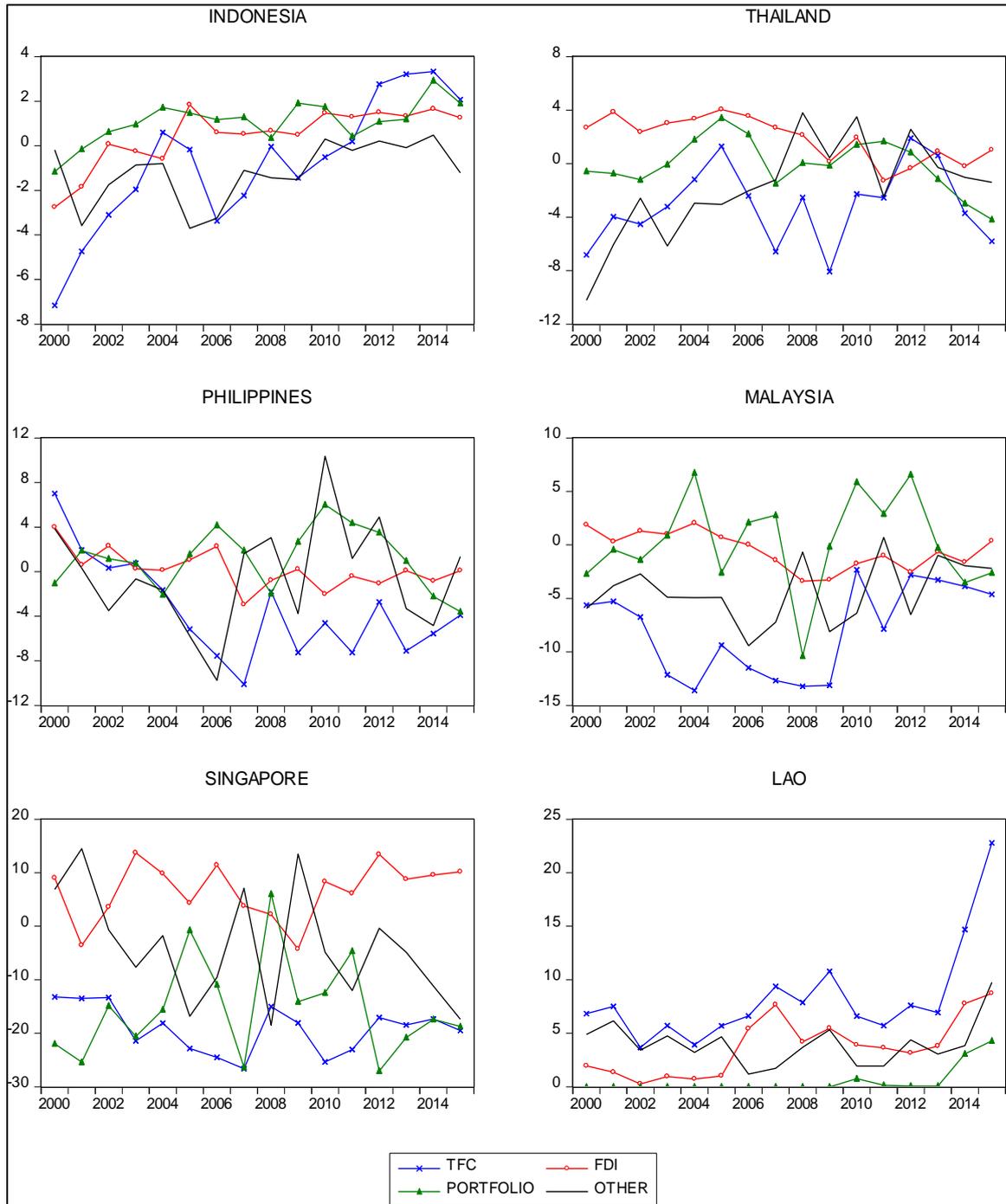


Figure 2.2: Average Foreign capital net inflows (2000-2015), % of GDP

Source: Author's calculation based on data from IMF/IFS and WB/World Development Indicators 2016

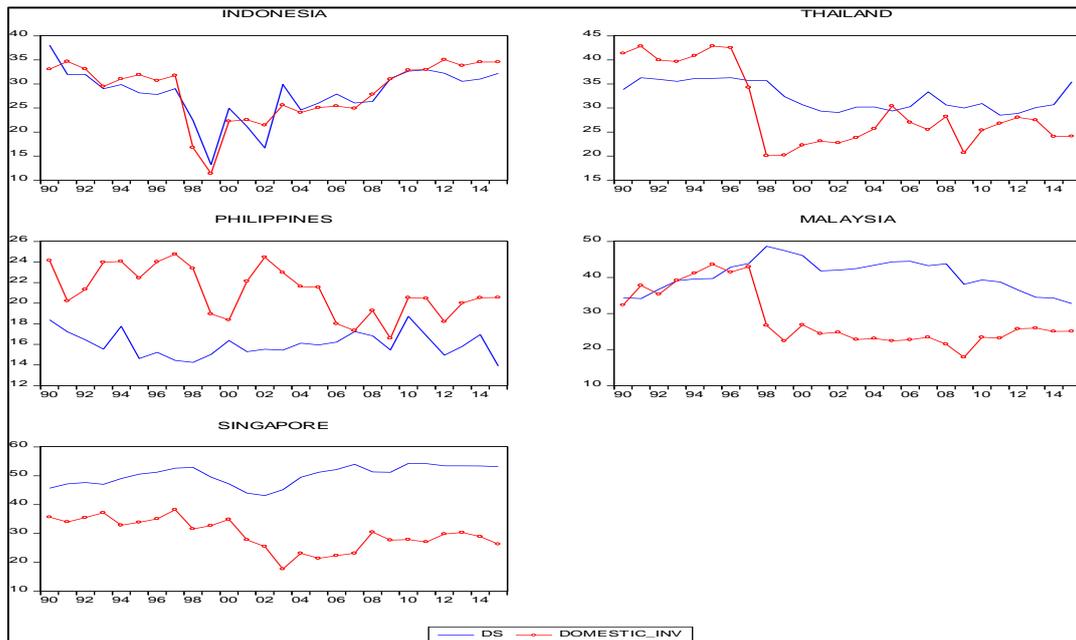


Figure 3.1: Gross Domestic Savings and Investment (1990-2015), % of GDP

Source: WB/World Development Indicators 2016

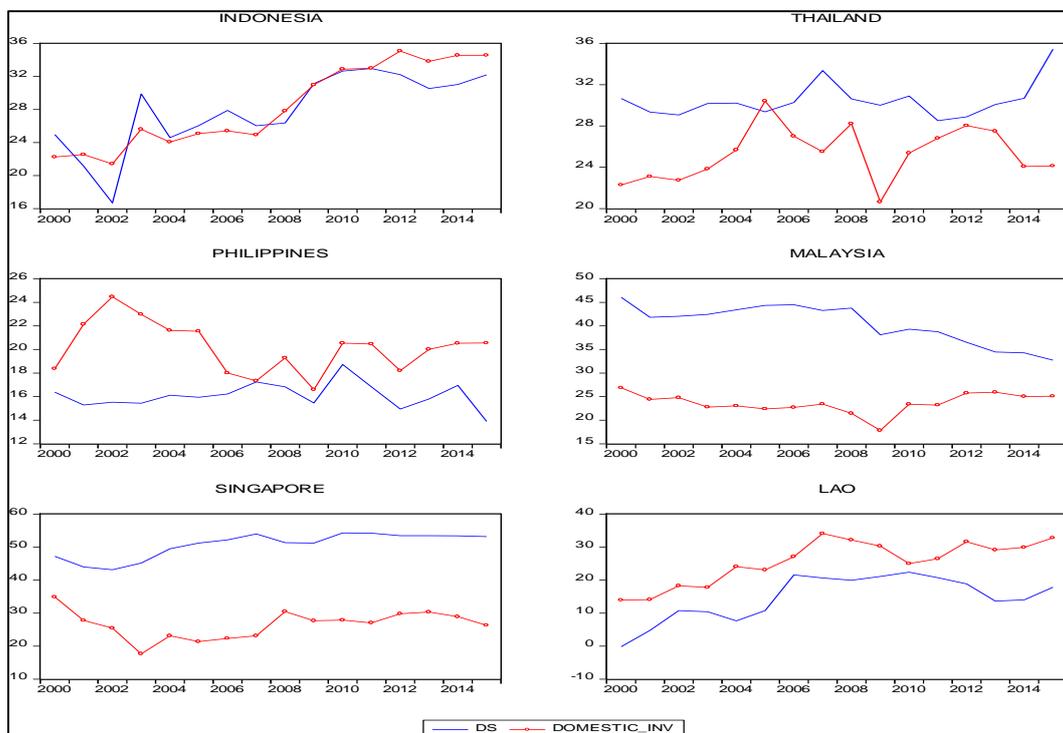


Figure 3.2: Domestic Savings and Investment (2000-2015), % of GDP

Source: WB/World Development Indicators 2016

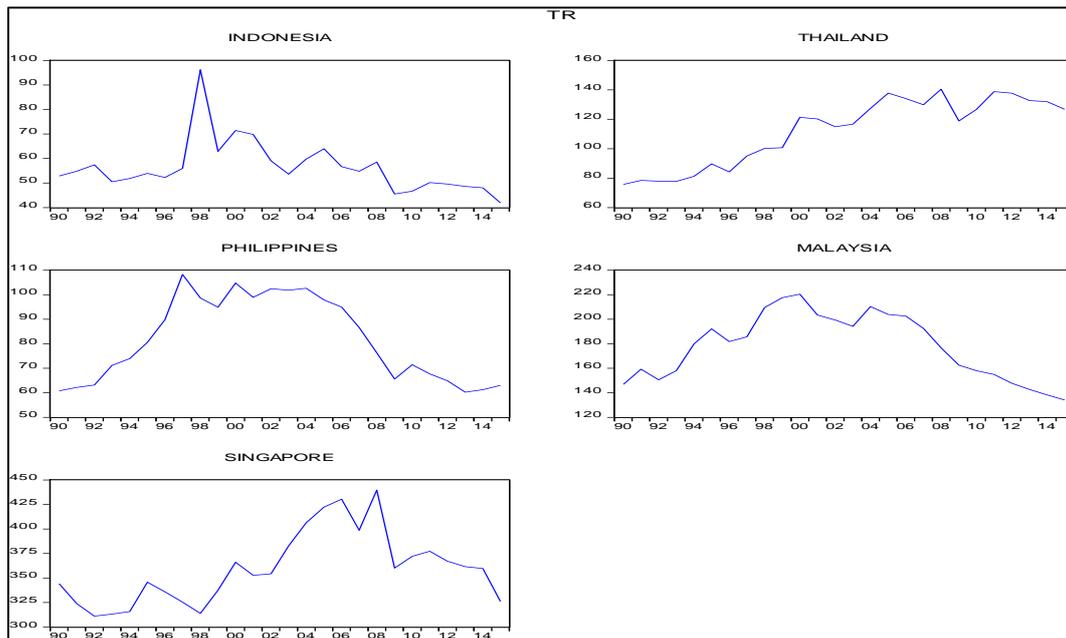


Figure 4.1: Trade openness, % of GDP (1990-2015)

Source: WB/World Development Indicators 2016

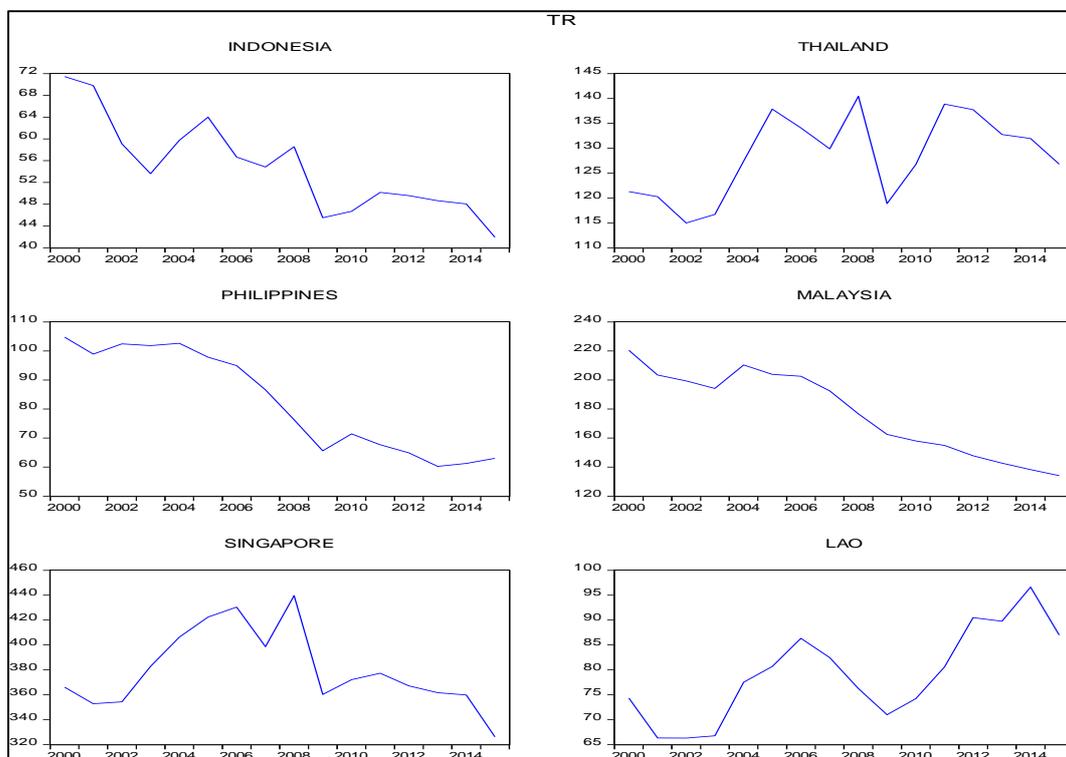


Figure 4.2: Trade openness, % of GDP (2000-2015)

Source: WB/World Development Indicators 2016

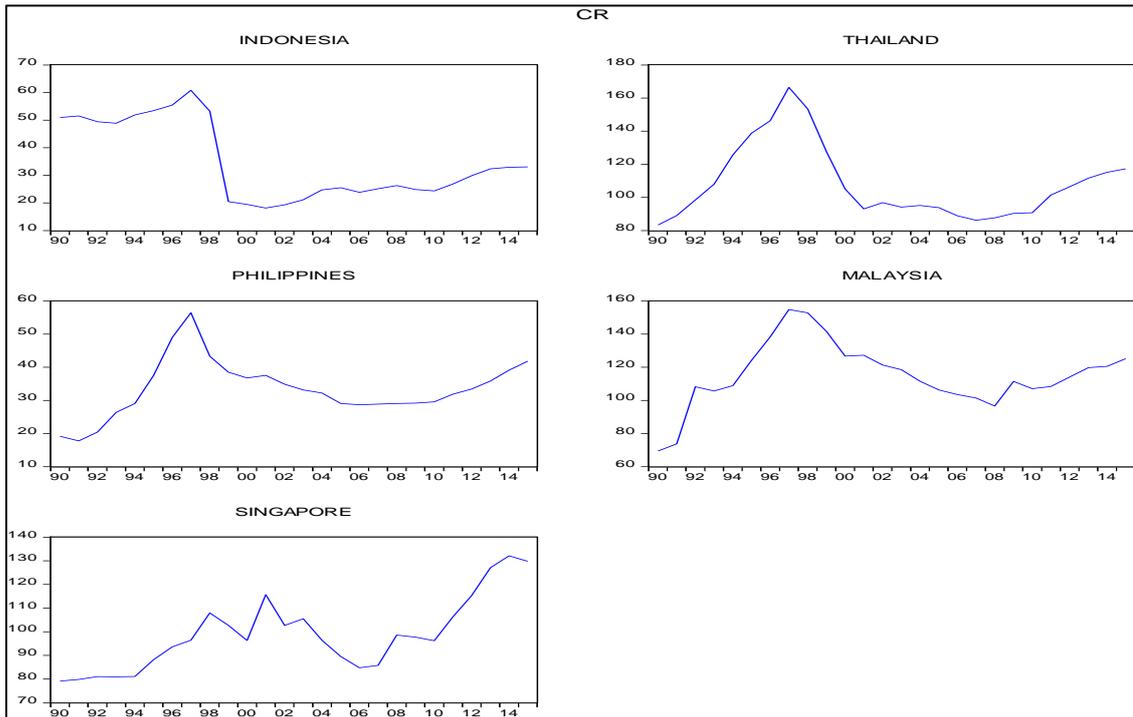


Figure 5.1: Domestic credit to private sector, % of GDP (1990-2015)  
 Source: WB/World Development Indicators 2016

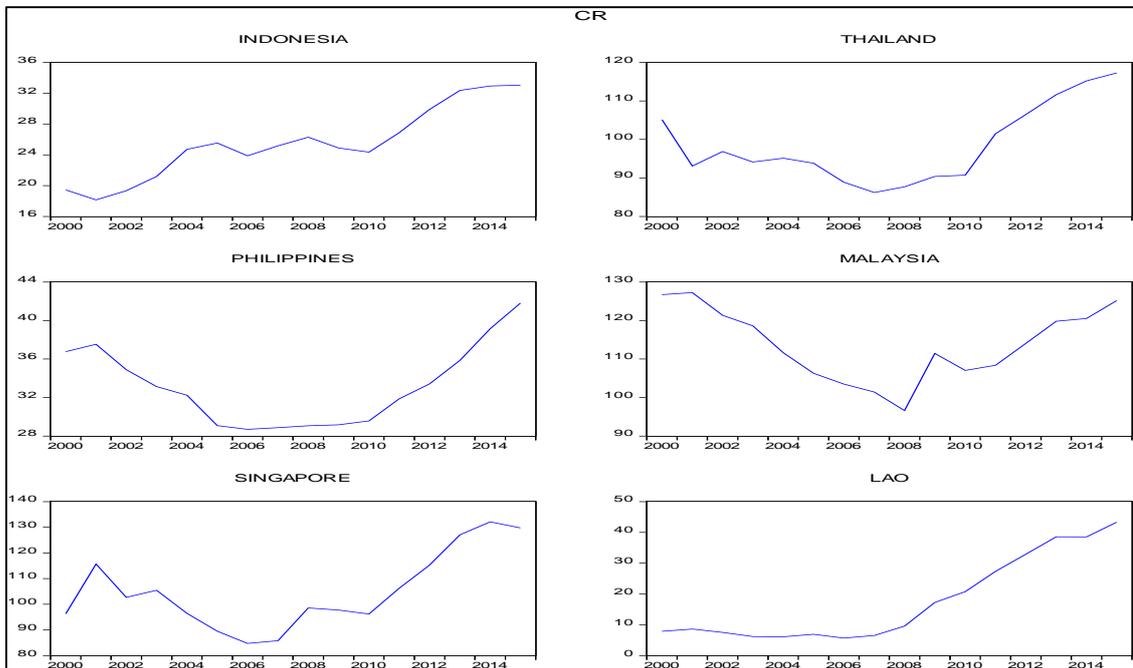


Figure 5.2: Domestic credit to private sector, % of GDP (2000-2015)



Table 7: Measurement of Variables

Variables	Proxy used (Period covered: 1990-2015)	Source of data
DS	Gross domestic savings (% of GDP). Gross domestic savings are calculated as GDP less final consumption expenditure (total consumption)	WB/WDI 2016
GDP_GR	Annual percentage growth rate of GDP per capita based on constant local currency	WB/WDI 2016
Domestic_INV	Gross capital formation (formerly gross domestic investment), Gross capital formation or Gross Domestic Investment (% of GDP). It consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings.	WB/WDI 2016
FC: 1). TFC 2). FDI 3). PORTFOLIO 4). OTHER	FC: Vector of foreign capital net inflows (net incurrence of Liabilities minus net Acquisition of financial assets): 1). Total foreign capital net inflow is the sum of net inflows of FDI, Portfolio investment, and Other investment 2). Foreign direct investment, net inflows, % of GDP. Foreign direct investment is the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. 3). Portfolio investment, net inflow, % of GDP. Portfolio equity includes net inflows from equity securities other than those recorded as direct investment and including shares, stocks,	Author's calculation based on data from IMF/IFS_ Balance of Payments and International Investment Position presentation (net current account), and WB/WDI 2016 ( for GDP)

Variables	Proxy used (Period covered: 1990-2015)	Source of data
	depository receipts (American or global), and direct purchases of shares in local stock markets by foreign investors. 4). OTHER: Other Investment, net inflow, % of GDP (Other investment includes loans, financial transactions in currency and deposits, and trade credit and advances)	
Initial mean years of schooling: Schl_YEARS	The average years of schooling of population aged 15 and above in starting year refers to 1990 for the 1990-2015 period and to the year 2000 for the 2000-2015 period	WB/Education Statistics (Barro-Lee)
CR	Domestic credit to private sector by banks, % of GDP	WB/WDI's 2016. For the Lao PDR, data from 2011 onward is based on data from Bank of the Lao PDR's annual report
Trade openness: TR	Trade is the sum of exports and imports of goods and services measured as percent of GDP	WB/WDI's 2016
D <sub>LAO</sub>	The country dummy variable that captures the influence of Lao PDR's country specific or unobserved factors	
<p><b>Studied periods:</b> 1). From 1990 to 2015 (5 countries are included: Indonesia, Malaysia, Thailand, Philippines, and Singapore)                  2). From 2000 to 2015 (6 countries are included: Indonesia, Malaysia, Thailand, Philippines, Singapore, and Lao PDR)  <b>Note:</b> For Lao PRD, before 2000, Domestic Savings rate and domestic investment rate data are not available, and before 2010, portfolio investment data of the country is not available.</p>		