

Research Paper

**Does Financial Liberalization Matter on
Capital Flows and Economic Growth?:
Evidence from Asian Economies**

In partial fulfillment of the requirements for the Degree of
Master of Public Policy/International Program (MPP/IP)

Submitted by:

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Submitted to:

The Graduate School of Public Policy
The University of Tokyo

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August 2018
Tokyo, Japan

Does Financial Liberalization Matter on Capital Flows and Economic Growth: Evidence from Asian Economies

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Abstract

This study basically tries to seek evidence on whether financial liberalization matter on capital flows and economic growth. This paper revisits and explores the role of capital account liberalization in influencing the movement of capital, conditional on the stage of economic development of a sample of Asian economies. This study attempts to test whether the *neoclassical view* on capital flows is confirmed, when the degree of capital account liberalization is considered (or does the *Lucas paradox* view on capital flows still ensues). This study finds that, when accounting for the degree of capital account openness or financial liberalization, the prediction of the neoclassical theory is confirmed, for a sample of Asian economies, using fixed effects panel regression. That is, relatively poorer countries tend to experience capital inflows and relatively richer countries tend to experience capital outflows (reduced capital inflows), when degree of capital account openness is considered. This paper also tries to assess the impact of financial liberalization on economic growth (zooming in to the case of the Philippines). This paper estimates a growth regression model that attempts to capture the differential effect of capital account openness on economic growth, when interacted with variables that are believed to be sensitive to capital account liberalization. The results confirmed that the degree of capital account liberalization matters to economic growth (in the case of the Philippines).

Keywords: Capital flows, capital account openness, financial liberalization, economic growth

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¹ This research is undertaken by Mr. Christofer A. Martin, Master of Public Policy (International Program) student at the Graduate School of Public Policy, The University of Tokyo. The author is thankful to Professor Kenichi Ueda and Professor Konstantin Kucheryavyy for their insightful guidance of this research paper. Nonetheless, the views expressed herein do not represent the views of The University of Tokyo. Errors and omissions are sole responsibilities of the author.

Table of Contents

I. Introduction	4
II. Literature Review.....	6
III. Impact of Capital Account Openness on Capital Flows: Evidence from Asian Economies.....	9
A. Model.....	9
B. Data and Methodology.....	9
C. Findings	12
D. Robustness	16
IV. Impact of Capital Account Openness on Economic Growth: Philippine Case	17
A. Model and Data.....	17
B. Findings.....	18
V. Conclusion and Policy Implications.....	19
VI. Limitations	21
References:.....	22
Annexes	
Annex A: Data Description and Data Sources	25
Annex B: Summary Statistics and Correlations	27
Annex C: Regression Results Using “Net Current Account Flows to GDP” as Dependent Variable.....	29
Annex D: Regression Results Using Non-Overlapping 5-Year Averages.....	31
List of Figures	
Figure 1: KAOPEN Index across Asian Economies	10
List of Tables	
Table 1: List of Asian Countries in the Panel by Income Groups.....	11
Table 2: List of Asian Countries in the Panel by Degree of Capital Account Openness	11
Table 3: Capital Flows and Capital Account Openness in Asia by Income Groups.....	12
Table 4: Capital Flows and Capital Account Openness in Asia	13
Table 5: Capital Flows and Capital Account Openness in Asia by Degree of Openness.....	14
Table 6: Robustness Check by Adding Control Variables	16
Table 7: Impact of Capital Account Liberalization on Philippine Economic Growth.....	19
Table 8: Capital Flows and Capital Account Openness in Asia by Income Groups (using Net Current Account to GDP).....	29
Table 9: Capital Flows and Capital Account Openness in Asia (using Net Current Account to GDP)	29
Table 10: Capital Flows and Capital Account Openness in Asia by Degree of Openness (using Net Current Account to GDP).....	30
Table 11: Capital Flows and Capital Account Openness in Asia by Income Groups (using 5-year averages)	31
Table 12: Capital Flows and Capital Account Openness in Asia (using 5-year averages).....	31
Table 13: Capital Flows and Capital Account Openness in Asia by Degree of Openness (using 5-year averages)	32

I. Introduction

Up to this date, the determinants of the direction, volume and composition of capital flows, as well as its relationship with economic growth still constitute an important subject in open-economy macroeconomics. Over the years, capital flow movements have been at the epicenter of the debate on global economic imbalances and remain relevant in the aftermath of various types of financial crises, like the Asian Financial Crisis (AFC) in 1997-98 and the Global Financial Crisis (GFC) in 2008-09. The debates are still ongoing as it remains unclear, empirically, whether (and which) policies can result in an outflow or inflow of capital.

There are basically two schools of thought that try to explain the movement of capital across countries, at different stages of development: 1) "*Neoclassical theory*;" and 2) "*Lucas paradox*".

Based on the *Neoclassical theory*, when accounting for the degree of capital account openness, less developed (relatively poor) countries should tend to experience net capital inflows and more developed (relatively rich) countries should tend to experience net capital outflows (Reinhardt, Ricci and Tressel, 2010). The Neoclassical theory points that with similar technologies across countries producing the same goods, new investment (and therefore net capital inflows) should take place in relatively poorer countries with lower stocks of capital per capita and therefore a higher marginal product of capital (MPK).

The second school of thought in relation to the movement of capital is the *Lucas paradox*. Lucas (1990) observed that there is only a small volume of capital that flows from rich to poor countries, which is in contrast with the prediction of the standard neoclassical model.

A plethora of empirical and theoretical literature has surfaced to provide insights to the Lucas paradox, by configuring the basic neoclassical model through the incorporation of additional factors. Based on the literature, the factors that support the Lucas paradox can be divided into two groups. The first group of factors relates to the elements of the production function, that is, differences in technologies, differences in factors of production (i.e., human capital, and the importance of land in production), and government policies (i.e., the roles of taxation on profits, financial repression, or restrictions on capital flow). Meanwhile, the second group of factors relate to the role of institutions and economic uncertainty, which includes capital market imperfections, enforcement of private contracts, asymmetric information, moral hazard, and sovereign default risks.

This paper mainly focuses on the impact over time of capital account openness or liberalization on capital flows on a sample of Asian countries at different levels of income. Capital account openness have dramatically evolved over the past four decades (starting 1980). This paper aims to show that the liberalization process is associated with the significant movement of capital flows across Asian countries. From an open-macroeconomy standpoint, this could provide insights on which policies are relevant in affecting movement of capital across countries over time.

In the past, many developing countries still had significant capital account restrictions in place, especially during the time when Lucas (1990) coined the Lucas paradox. However, over the years, countries across the world have progressively liberalized their capital account restrictions. In Asia, according to Chinn and Ito (2007), since 1970, there has been a relatively high level of financial openness, although the rate of financial opening slowed down in the aftermath of the

AFC in 1997-1998, but still a considerable degree of financial openness can be observed even after the AFC. Figure 1 (on page 10) shows the process of capital account liberalization across a sample of Asian economies from 1980 to 2016.² The opening of capital account (also considered as deregulations) forms part of the reforms dictated by the International Monetary Fund (IMF) for the resolution of the AFC in 1997-98. Since then, most of the regulatory restrictions on asset and liability management at banks, and on capital account transactions have been eased or phased out to create a market-oriented and open financial regime. Most of these reforms on regulatory restrictions aim to: 1) Align policy with other countries; 2) Promote domestic business activities and risk diversification; 3) Support greater international integration; and 4) Encourage shift of FX transactions to formal channels.

Most high-income countries in Asia like Japan, Kuwait, Lebanon, Malaysia and Saudi Arabia initiated the process of capital account opening in the 1980s; meanwhile, emerging markets followed the same process of financial account opening, but with a lag. The trends in the capital account liberalization movements suggest that aside from looking at the cross-sectional properties of financial liberalization across countries, looking at the time series properties of data is also crucial in testing how financial liberalization affects capital flows movements across countries at different stages of economic development.

Various studies point that capital account liberalization affect capital flow dynamics across countries (in an open-macroeconomy framework); therefore, there should be a reason to believe that capital account liberalization matters, as well, to economic growth. This paper, therefore, attempts to contribute to this body of research by mapping the impact of easing capital restrictions on capital flows and economic growth in Asia, during the past four decades. Basically, this paper tries to answer the following research questions:

- Does capital flow from rich to poor countries (using a sample of Asian countries)? Does the prediction of the standard neoclassical theory hold when the degree of capital account openness is considered across the sample of Asian economies (or does the Lucas paradox still ensues)?
- What impact does capital account liberalization has on economic growth, and through which channels?

The paper proceeds as follows. Section II presents an overview of related literature. Section III provides the overall empirical strategy and findings on the impact of capital account liberalization on capital flows (evidence from Asian countries). Section IV presents the overall empirical strategy and findings on the impact of capital account openness on economic growth (Philippine case). Section V concludes and presents policy implications, and Section VI provides the limitations of this paper.

² The measure of capital account liberalization in Figure 1 is the Capital Account Openness index used by Chinn and Ito (2007) which will be discussed in the succeeding parts of this paper.

II. Literature Review

The flow of capital across borders could be explained by two schools of thought based on literature. The first school of thought is the *Neoclassical theory*, which states that when accounting for the degree of capital account openness, less developed (relatively poor) countries tend to experience net capital inflows and more developed (relatively rich) countries tend to experience net capital outflows (Reinhardt, Ricci and Tressel, 2010).

The second school of thought is the Lucas paradox, which argue that capital does not flow from rich to poor countries, which is in stark contrast with the prediction of the standard neoclassical model (Lucas, 1990). There is a plethora of literature which try to lend support to the Lucas paradox. Most of these empirical studies of the Lucas paradox usually show how relaxing one (or several) assumptions of the basic neoclassical model helps explain how capital flows from rich to poor countries. There are studies which try to point that the following factors are relevant for the direction of cross-border net capital flows: differences in human capital (Lucas, 1990); risks of sovereign default (Reinhart and Rogoff, 2004); differences in technological capacity (Eichengreen, 2003); differences in institutional quality (Alfaro et al., 2008). Few other papers elaborate on the institutional quality pointing that government policies and institutional structure (Hall and Jones, 1999) and protection against the risks of expropriation (Acemoglu and Johnson, 2005) have first-order effects on economic performance by affecting investment and total factor productivity (TFP).

Some literature cites that the presence of frictions in national borders may explain why the standard neoclassical model does not always work in accounting for the movement of capital flows (Kalemli-Ozcan et al., 2008). To make this analogy, they concentrate on interstate capital flows within the US (representing no restrictions to capital flows and no difference in institutions) and find that the standard neoclassical prediction of capital flows is confirmed between US states. Authors also point to financial frictions as an important determinant of international capital flows. Gourinchas and Jeanne (2009) proved that, among developing countries, capital flows more to countries at lower levels of economic growth. Gourinchas and Jeanne (2009) calibrated a neoclassical model and found that a wedge affecting saving decision may explain this capital "allocation puzzle".

Other literature point to measurement problems as another perspective on the paradox of capital flows [Caselli and Feyrer (2007)]. These authors found that MPK is relatively similar across countries, especially when the share of income accruing to physical capital is properly measured. Nonetheless, there remain some doubt regarding evidence suggesting equalization of aggregate MPK, citing evidence that microeconomic factors that could result in substantial differences in productivity and MPK between firms (Hsieh and Klenow, 2009; Restucia and Rogerson, 2008; Alfaro et al., 2007). Monge-Naranjo, Sanchez and Llopis (2015) argue that differences in MPK could also be brought about by production factors not being efficiently allocated across countries. To this end, they adjusted the marginal products of physical and human capital, accounting for the output share of natural resources (which is a factor that cannot be reallocated across countries).

Capital flow dynamics is also related to one of the major puzzles of financial economics, such as the high correlation between savings and investment (otherwise known as the *Feldstein-Horioka puzzle*). Some literature provides evidence that the process of financial liberalization among European countries resulted in greater financial integration among European countries, as

capital flow towards relatively poorer countries, resulting in a declining correlation of savings with investment (Coeurdacier and Martin, 2009; Lane and Milesi-Ferretti, 2008; and Blanchard and Giavazzi, 2002).

While there is a large body of literature providing explanations to the Lucas paradox view of capital flow dynamics, there are, to date, few empirical studies assessing the role of capital account restrictions/openness in shaping capital flow movements and its impact on economic growth. To date, there is no strong consensus on the effectiveness of capital controls (see Edwards, 1999; Edwards and Rigobon, 2009; Forbes, 2007; Edison and Reinhart, 2001). Ostry et al., (2010) argue that, capital restrictions may seem effective when they are in place, but such restrictions only seem to affect composition rather than volume of capital flows.

This paper attempts to contribute to this body of research by showing that, during the past 36 years (from 1980 to 2016), the easing of capital account restrictions affected the global allocation of capital to a sample of Asian economies. This paper also tries to map the determinants of current account flows across a sample of Asian economies, including fiscal policy, demographics, net foreign assets, the role of financial development, financial crisis, political risks etc. as provided in most literatures by Chinn and Prasad (2003), Chinn and Ito, (2007), Gruber and Kamin, (2008).

Another section of this paper will focus on the impact of financial liberalization on economic growth. In this field, there are several earlier studies on financial development and economic growth that attempted to identify the possible channels through which financial liberalization could bring about improvements in the efficiency of the financial sector, with the attendant positive effect on economic growth [see Gurley and Shaw (1955), McKinnon (1973), and Shaw (1973)]. Based on these studies, the possible channels identified were government controls on market interest rates and asset and liability management at banks, which would cause stagnation in financial development, and ultimately, in economic growth. Meanwhile, Greenwood and Jovanovic (1990) concur that financial intermediation in a financially liberalized economy enhances efficiency of the economy and growth through better information processing and investment screening.

King and Levine (1993) conduct a cross-country regression analysis, and Beck, Levine, and Loayza (2000) perform country-level panel regression estimations which showed that financial development exerts positive effects on economic growth. Beck, Levine, and Loayza (2000) find that expansion and efficiency improvements of financial intermediation enhance TFP growth but have little long-term effect on investment or the savings rate. Levine (2005) argues that finance has positive impact on growth as it improves the allocation of capital by easing external financing constraints on firms, and that countries with more efficient financial systems grow faster. Several empirical studies on the finance–growth nexus confirms Levine’s view, although there are also other experiences of emerging economies which suggest that the positive effect is not universal.

Rajan and Zingales (1998) present evidence that the degree of technological financial dependency on external financing differs from industry to industry. This difference means that financially dependent industries would be able to take advantage of the potential growth opportunities presented by financial growth and development more than those industries requiring less external financing. Given the differences in external financial dependency,

therefore, financial market development would result in differential rates of growth in different industries.

Analyzing firm-level data from 30 countries, Demircuc-Kunt and Maksimovic (1998) find that wider access to external finance tends to encourage long-run growth of firms. An empirical examination of the panel data on a number of firms from 13 developing countries by Laeven (2003) finds that small firms are more financially constrained than large firms before the start of financial liberalization, but afterwards the larger ones are squeezed on credit allocation. This is because large firms no longer benefit from preferential credit they were accorded during financial repression. Beck et al. (2008) show that financial development through market-oriented reforms promotes growth of smaller firms and industries as it eases obstacles that firms face in their external financing.

There are varied results on the impact of capital account liberalization on growth. For instance, Quinn (1997) suggests that capital liberalization had a positive effect on real GDP per capita. Klein and Olivei (2000) also found positive effect of capital account liberalization on growth of industrialized countries, but no significant results were found for emerging economies. Edwards (2001) argues that the impact of capital account liberalization on growth is dependent on the level of development of an economy. Edison et al., (2002) use different ways of measuring capital account openness across [Organisation for Economic Cooperation and Development (OECD)] countries and developing economies and found significant effects of liberalization on growth in East Asian countries. However, results were weak for OECD and Latin American countries. Some studies remarked weak or no significant relationship between openness and growth. Rodrik (1998) finds that liberalization has no significant impact on real GDP per capita, investment-to-income, and inflation over the period 1975-1989. Similarly, Kraay (1998) finds no relationship between a variety of measures of capital account openness and economic growth.

This paper builds on previous studies in this field as it zooms in to the impact of financial liberalization on economic growth by estimating a growth model that tries to capture the differential effect of financial liberalization on GDP per capita growth, when interacted with a set of predictors that is expected to be greatly affected by financial liberalization. The analysis on the impact of financial liberalization on economic growth will zoom in to only one country in Asia (i.e., the Philippines) to fully understand the mechanism and the channels through which capital account liberalization affects GDP per capita growth.

III. Impact of Capital Account Openness on Capital Flows: Evidence from Asian Economies

A. Model

This paper focuses on the impact of capital account liberalization on capital flows of select Asian countries at different levels of income per capita, using a fixed effects panel framework. This paper tries to estimate the following equation (as modified from Reinhardt et al., 2010):

$$\left(\frac{\text{Gross Flows}}{\text{GDP}}\right)_{it} = \alpha_i + \delta_t + \beta_0 + \beta_1 \text{GDPPC}_{i,t-1} + \beta_2 \text{KAOPEN}_{it} + \beta_3 \text{GDPPC}_{i,t-1} * \text{KAOPEN}_{it} + \rho Z_{it} + \varepsilon_{it}$$

$\left(\frac{\text{Gross Flows}}{\text{GDP}}\right)_{it}$	Gross capital flows (proxied by gross current account inflows/ relative to GDP) of country “i” at time “t”
$\text{GDPPC}_{i,t-1}$	Log of real GDP per capita relative to the US (in PPP) of country “i” at time “t-1”
KAOPEN_{it}	Capital Account Openness index of country “i” at time “t”, using the Chinn-Ito Index of Financial Openness
$\text{GDPPC}_{i,t-1} * \text{KAOPEN}_{it}$	Captures the extent to which capital account openness has affected the movement of capital across countries, considering the country’s level of development
Z_{it}	Represents vector of control variables that are included in the conditional specifications. <ul style="list-style-type: none"> ➤ Fiscal balance ➤ Old-age dependency ratio ➤ Population growth ➤ Net foreign asset position (lagged by 1 period) ➤ Oil trade balance ➤ Exports to GDP
α_i	Country-specific fixed effects
δ_t	Time-specific fixed effects
ε_{it}	Error term

Note: Full description of the data and their sources are in Annex A: Data Description and Sources

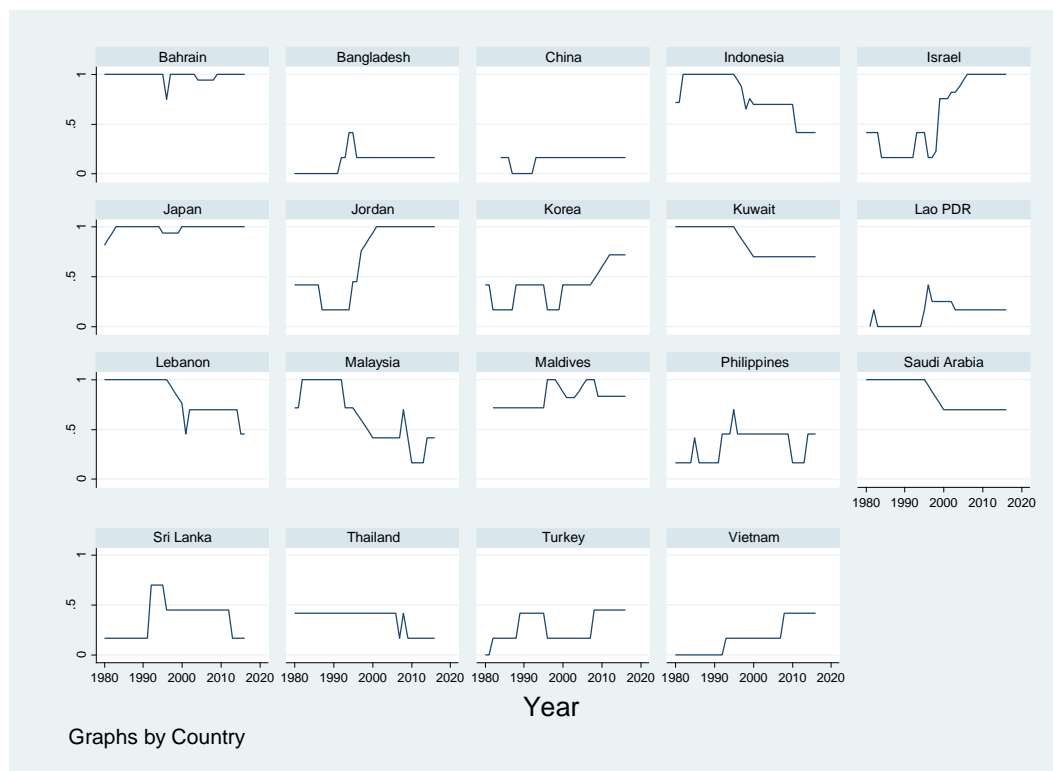
B. Data and Methodology

All the data used in the panel are annual observations from 1980-2016. The dependent variable, $\left(\frac{\text{Gross Flows}}{\text{GDP}}\right)_{it}$, represents the gross capital flows as proxied by the gross current account inflows (relative to GDP). Using current account flows³ as proxy seems appropriate because these flows are the ones directly affected by the easing/tightening of capital account restrictions. The variable “KAOPEN” represents the Capital Account Openness index constructed by Chinn and Ito (2007), which measures the extent of openness in capital account transactions and is based on the information from the IMF’s Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). The construction of the KAOPEN index assigns dummy variables for 4 major categories on the restrictions on external accounts: 1) presence of multiple exchange

³ Current account flows represent the sum of current account flows for goods and services, primary income flows and secondary income flows from the Balance of Payment Statistics, International Financial Statistics of the IMF.

rates; 2) restrictions on current account transactions; 3) restrictions on capital account transactions; and 4) requirement of the surrender of export proceeds. The KAOPEN index uses principal components analysis, which takes on a higher value (between 0 to 1) when a country is more open to cross-border transactions. The KAOPEN, however, does not distinguish between controls on capital outflows and inflows on a disaggregated basis. Figure 1 shows the movement of the KAOPEN index across a sample of Asian economies

Figure 1: KAOPEN Index across Asian Economies



Source of basic data: Capital Account Openness Index database (updated to 2015) by Chinn and Ito

The coefficients β_1 , β_2 , and β_3 are the main coefficients of interest. The expected signs of the coefficients of interest are dependent on the level of development of countries in the sample as well as on the degree of capital account openness. If the coefficient, β_1 , is positive and significant, then, the real GDP per capita (relative to the US) in PPP terms have a positive relationship with capital inflows. If the coefficient, β_2 , is positive and significant, countries having a fully open capital account display the positive relationship between KAOPEN and capital inflows, as predicted by the neoclassical model. Most importantly, if the coefficient of the interaction term, β_3 , is positive and significant, countries in Asia experience capital inflows if the degree of their capital account openness is high, dependent on their level of economic development. The vector Z_{it} represents a host of control variables that are important for current account flows. For instance, fiscal balance, demographic variables (old-age dependency ratio and population growth), net foreign assets position and oil trade balance were found to be important determinants of current account (Chinn and Prasad, 2003, and Chinn and Ito, 2007).

This study focuses on the relationship of the variables of interest (i.e., KAOPEN and real GDP per capita relative to US) with capital flows (as proxied by gross current account inflows); thus, to make a more conclusive findings, incorporating as many Asian countries as possible is key. Table 1 shows the list of Asian countries included in the panel. The selection of this sample of

countries is based on the availability of the KAOPEN index in the 2015 updated database by Chinn and Ito. To make the case that the country's level of development matters on capital flows for countries with open capital account, the countries in the sample were grouped based on World Bank's Income Classification for the year 1997, when most Asian countries liberalize their capital account the year 1997.

Table 1: List of Asian Countries in the Panel by Income Groups

Low Income (3)	Lower Middle Income (7)	Upper Middle Income (5)	High Income (4)
Bangladesh Lao PDR Vietnam	China Indonesia Jordan Maldives Philippines Sri Lanka Thailand	Bahrain Lebanon Malaysia Saudi Arabia Turkey	Israel Japan Korea Kuwait

Note: The groupings are based on the World Bank's Income Classification for the Year 1997

To explore how capital account openness impact capital flows across Asian countries, considering level of development of Asian countries, a fixed effects panel regression is estimated in this study. The first estimation in Table 3, explores the relationship of the variables of interest by estimating a panel regression for Asian economies over the period 1980 to 2016 by income groups. Table 4 presents full sample regression for the period 1980-2016 and observe the behavior of the variables of interest, and at the same time, putting the vector of standard controls. Table 4 also presents the results of the pooled OLS regression, alongside the results of panel fixed effects regression, for comparison purposes. Table 5 shows another possible regression variation by grouping Asian countries into two groups. The first group refers to countries with relatively "Low KAOPEN," and the second group refers to countries with relatively "High KAOPEN". The median KAOPEN for the full sample is computed at around 0.54 index points. The average KAOPEN of each Asian country is then compared to this full sample median. If average KAOPEN of a country is below the median, the country will be considered as a country with relatively close capital account. If average KAOPEN of a country is above the median, the country will be considered as a country with relatively open capital account. Table 2 shows the groupings of the countries in the panel based on the degree of capital account openness.

Table 2: List of Asian Countries in the Panel by Degree of Capital Account Openness

Low Average KAOPEN (9)		High Average KAOPEN (10)	
Bangladesh	Sri Lanka	Indonesia	Malaysia
China	Thailand	Jordan	Saudi Arabia
Lao PDR	Turkey	Maldives	Israel
Vietnam	Korea	Bahrain	Japan
Philippines		Lebanon	Kuwait

Note: Average KAOPEN of countries are compared to full sample median to arrive at these groupings.

The estimation of the panel fixed effects regression is due to the notion that it is likely that slow-moving unobservable variables (i.e., time-specific and country-specific fixed effects) have impact on the main coefficients of the variables of interest. The summary statistics of variables as well as correlations are presented in Annex B: Summary Statistics and Correlations.

C. Findings

**Table 3: Capital Flows and Capital Account Openness in Asia by Income Groups
(Panel Fixed Effects Regression)**

Variables	Dependent Variable: Gross Current Account Inflows to GDP			
	Countries by Income Groups			
	Low	Lower Middle	Upper Middle	High
Log GDP/capita (PPP) relative to US_(t-1)	0.3045 *** (0.0594)	0.1362 *** (0.0426)	-0.2603 (0.2792)	0.2299 *** (0.0114)
KAOPEN	0.9007 *** (0.2192)	0.8943 *** (0.2050)	-1.7732 * (0.9563)	1.1896 *** (0.0363)
Log GDP/capita_(t-1)*KAOPEN	-0.5095 *** (0.1771)	-0.4153 *** (0.0908)	0.4199 (0.2944)	-0.2634 *** (0.0243)
Observations	75	213	128	103
Countries	3	7	5	4
Country Fixed Effects	Yes	Yes	Yes	Yes
R-squared (within)	0.5335	0.0952	0.1827	0.564
R-squared (overall)	0.2703	0.0104	0.0881	0.1452
F-Test	26.30	7.12	8.94	2.59
p-value	0.0000	0.0001	0.0000	0.0005

Standard errors are in parentheses, ***p<0.01, **p<0.05, *p<0.10

Source: Author's estimation

Table 3 shows the relationship of the variables of interest across income groups in Asia, by using fixed effects panel regression, covering data from 1980 to 2016. Based on these results, there is a strongly positive and significant unconditional relationship between the level of real GDP per capita (PPP terms) relative to US and gross current account inflows. Hence, on average, most Asian countries, regardless of their income groups experienced gross capital inflows during the review period. Findings for the low- and lower-middle income groups in Asia are consistent with the neoclassical view of capital flows (i.e., relatively poorer countries tend to experience capital inflows). Findings for the high-income group, however, is in contrast with the neoclassical view; meanwhile, findings for upper-middle income group is insignificant. For the middle-income group, there appears to be no systematic relationship between the level of economic development and gross capital flows. This may imply that for this income group, capital account restrictions must have been effective in constraining capital flows when they are in place. The coefficient of KAOPEN are also strongly positive and significant for low-, lower-middle and high-income groups. This is consistent with this paper's hypothesis, that, countries with higher degree of capital openness tend to experience capital inflows. The reason for including an interaction term is that the neoclassical theory predicts that the effect of removing capital account restrictions is dependent on the level of development. Looking at the results, the effect of income for countries with open capital account (represented by the sum of the first and third

coefficients, whose p-value is reported at the bottom) yields a net negative and significant result.⁴ This suggest that, for this specification, the effect of the level of development for countries with open capital account results in a reduction of capital inflows across income groups in Asia.

**Table 4: Capital Flows and Capital Account Openness in Asia
(Pooled OLS and Panel Fixed Effects Regression)**

Variables	Dependent Variable: Gross Current Account Inflows to GDP							
	OLS	FE	OLS	FE	OLS	FE	OLS	FE
Log GDP/capita (PPP) relative to US_(t-1)	0.0714 *** (0.0248)	0.0651 ** (0.0263)	0.1053 *** (0.0279)	0.0978 *** (0.0291)	-0.0179 (0.0223)	-0.0514 ** (0.0249)	-0.0395 (0.0269)	-0.0596 ** (0.0280)
KAOPEN			0.0898 (0.0976)	0.0802 (0.0983)	0.0142 (0.0301)	-0.0081 (0.0300)	-0.1058 (0.0969)	-0.0667 (0.0971)
Log GDP/capita_(t-1)*KAOPEN			-0.0452 (0.0324)	-0.0450 (0.0327)			0.0460 (0.0359)	0.0231 (0.0365)
Fiscal balance to GDP					-0.2600 *** (0.0805)	-0.2469 *** (0.0782)	-0.2303 *** (0.0831)	-0.2327 *** (0.0814)
Old-age dependency ratio					0.1185 (0.3360)	0.4522 (0.3605)	0.1123 (0.3380)	0.4381 (0.3615)
Population growth					-1.9392 *** (0.5472)	-2.2487 *** (0.5358)	-2.0262 *** (0.5465)	-2.2770 *** (0.5381)
Net Foreign Assets to GDP _(t-1)					0.1146 *** (0.0402)	0.1118 *** (0.0398)	0.1167 *** (0.0401)	0.1125 *** (0.0399)
Oil trade balance to GDP					0.2106 *** (0.0725)	0.2349 *** (0.0705)	0.2172 *** (0.0722)	0.2372 *** (0.0707)
Exports to GDP					0.8845 *** (0.0539)	0.8614 *** (0.0543)	0.8883 *** (0.0540)	0.8637 *** (0.0545)
Observations	522	522	519	519	368	368	368	368
Countries	19	19	19	19	19	19	19	19
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
R-squared (within)	0.0121	0.0121	0.0288	0.0291	0.5505	0.5552	0.5516	0.5557
R-squared (overall)	0.1354	0.1354	0.1042	0.09	0.5101	0.4089	0.526	0.4267
Wald chi ²	8.25		16.89		424.87		428.64	
F-Test		6.14		4.96		53.2		47.25
p-value	0.0041	0.0136	0.0007	0.0021	0.0000	0.0000	0.0000	0.0000

Standard errors are in parentheses, ***p<0.01, **p<0.05, *p<0.10

Source: Author's estimation

Another specification is through looking at full sample regression. Table 4 still shows the relationship of the variables of interest, but this time, full sample (without income groupings) and the standard vector of control variables were considered. Results of pooled OLS regression are also indicated in the table for comparison purposes; however, the discussion in this section will focus on the panel fixed effects regression estimates. Based on the results in Table 4, there is a positive and significant relationship between the level of GDP per capita (PPP terms) relative to US and gross current account inflows (columns 2 and 4). Thus, on average, Asian countries experienced current account inflows during the review period. The variable KAOPEN still have the expected positive sign in columns 2 and 4, but results are not significant in this specification. Interpreting the interaction term in this specification (in column 4; adding the first and third coefficients), yields a net positive and slightly significant result. This suggest that, the effect of

⁴ F-test: If the sum of the coefficient (log GDP per capita) and coefficient (log GDP per capita*KAOPEN)=0, then, the level of development has no correlation with gross current account flows for countries with fully opened capital account.

income for countries with open capital account in Asia results in capital inflow. This result suggest that the prediction of the standard neoclassical theory may be confirmed for countries with open capital account (especially for Asia where most of the countries in the panel are relatively poor).

Adding a vector of standard controls, the coefficient of relative GDP per capita turns slightly negative, opposite to the prediction without control variables. Looking at the last column (column 8), the sum of the coefficients of the real GDP per capita and the interaction term yields a very small negative number and slightly significant, suggesting that the effect of income for countries with open capital account in Asia results in a small reduction in gross inflows. The shifting of the signs of the sum of the coefficients of real GDP per capita and the interaction term seems to suggest that the degree of capital account openness matters when averaged over the review period. The small reduction in inflows could be attributed to the reduction in the degree of capital account openness across several countries in the panel. For instance, though several countries in the panel maintained a relatively liberalized capital account, the degree of openness has been reduced such as in Malaysia, Indonesia, Kuwait, Lebanon, Saudi, Sri Lanka and Thailand (especially after the AFC). This is the period where most countries in Asia tightened capital account restrictions (a bit) as a response mechanism to the crisis.

Looking at Table 4, the control variables that seem to significantly affect the current account dynamics are fiscal balance to GDP, population growth, net foreign assets to GDP, oil trade balance to GDP, and exports to GDP.

**Table 5: Capital Flows and Capital Account Openness in Asia by Degree of Openness
(Panel Fixed Effects Regression)**

Variables	Dependent Variable: Gross Current Account Inflows to GDP							
	Low	High	Low	High	Low	High	Low	High
Log GDP/capita (PPP) relative to US_(t-1)	0.1487 *** (0.0149)	-0.0278 (0.1550)	0.1525 *** (0.0169)	-0.1381 ** (0.0723)	0.0485 *** (0.0113)	-0.1147 ** (0.0518)	0.0442 *** (0.0121)	-0.1435 * (0.0778)
KAOPEN			0.2732 *** (0.0669)	-0.5522 *** (0.2103)	0.0128 (0.0171)	-0.0277 (0.0499)	-0.0313 (0.0491)	-0.1403 (0.2316)
Log GDP/capita_(t-1)*KAOPEN			-0.0743 *** (0.0278)	0.1258 ** (0.0635)			0.0197 (0.0205)	0.0412 (0.0828)
Fiscal balance to GDP					-0.1060 (0.0926)	-0.2891 *** (0.1082)	-0.1030 (0.0927)	-0.2679 ** (0.1165)
Old-age dependency ratio					1.4197 *** (0.3118)	0.5509 (0.5324)	1.2104 *** (0.3807)	0.5560 (0.5336)
Population growth					-4.0534 *** (0.8029)	-1.8659 ** (0.7335)	-4.4569 *** (0.9067)	-1.8464 ** (0.7362)
Net Foreign Assets to GDP _(t-1)					-0.1198 *** (0.0265)	0.1784 *** (0.0633)	-0.1155 *** (0.0269)	0.1794 *** (0.0634)
Oil trade balance to GDP					-0.0296 (0.1119)	0.2258 ** (0.1010)	-0.0421 (0.1127)	0.2369 ** (0.1037)
Exports/GDP					0.4972 *** (0.0326)	1.0127 *** (0.0856)	0.5010 *** (0.0328)	1.0115 *** (0.0859)
Observations	260	262	258	261	176	192	176	192
Countries	9	10	9	10	9	10	9	10
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (within)	0.284	0.0012	0.3363	0.048	0.8295	0.5741	0.8305	0.5747
R-squared (overall)	0.0685	0.0001	0.05	0.0128	0.0916	0.4892	0.0974	0.4992
F-Test	99.18	0.03	41.55	4.17	96.71	29.31	86.02	25.97
p-value	0.0000	0.8618	0.0000	0.0066	0.0000	0.0000	0.0000	0.0000

Standard errors are in parentheses, ***p<0.01, **p<0.05, *p<0.10

Source: Author's estimation

Another possible variation is by grouping Asian countries with respect to the degree of capital openness. Table 5 shows the fixed effects panel regression results if the countries will be grouped into two: “relatively Low KAOPEN” and “relatively High KAOPEN”. The determination on where to group the countries in the panel depends on whether the average KAOPEN of a country falls below or above the threshold (i.e., median KAOPEN of the full sample at around 0.54 index points). This specification provides very clear and concrete results for analysis. For countries with “relatively Low KAOPEN,” the level of country’s development (real GDP per capita) has a positive relationship with gross current account inflows. The countries included in the “Low KAOPEN” group are those countries that are considered relatively poor (i.e., Bangladesh, Lao PDR, Vietnam, Philippines, Sri Lanka, to name a few). Taking that into account, the neoclassical view of capital flows is confirmed (i.e., relatively poorer countries should tend to experience capital inflows, when their capital account is open). On the other hand, the countries included in the “High KAOPEN” group are those countries that are considered relatively richer (i.e., Japan, Israel, Kuwait, Saudi Arabia, Malaysia, to name a few). Based on the results, the “High KAOPEN” group has negative and significant coefficient for the real GDP per capita variable. This shows that “High KAOPEN” group experienced a reduction in gross inflows, confirming the prediction of the neoclassical theory that relatively richer countries should tend to experience capital outflows (in this case, reduced capital inflows), when their capital account is open. The coefficients of KAOPEN have the expected signs, that is, positive for the “Low KAOPEN group” and negative for the “High KAOPEN” group. This is still following the previous explanation that the degree of openness will result in capital inflows for “Low KAOPEN” group and reduced capital inflows for “High KAOPEN” group, mainly because of the country composition. Further, adding the first and third coefficients, yields a net positive coefficient for “Low KAOPEN” group and a net negative coefficient for “High KAOPEN” group.⁵ Again, these results are consistent with the neoclassical view that relatively poorer countries should experience capital inflows, and relatively richer countries should experience capital outflows (reduced capital inflows, in this case), considering the degree of capital account openness.

Same as before, the control variables that seem to significantly affect the current account dynamics are fiscal balance to GDP, old-age dependency ratio, population growth, net foreign assets to GDP, oil trade balance to GDP, and exports to GDP.

So far, the estimations in Tables 3, 4 and 5 deals with “gross current account inflows to GDP” as dependent variable. This paper also tried to estimate the same regressions as in Tables 3, 4 and 5 using “net current account to GDP” as dependent variable (results of these regressions are presented in Tables 8, 9 and 10 in Annex C). Nonetheless, the results and storyline are still the same whether “gross current account inflows to GDP” or “net current account to GDP” is used as dependent variable.

Moreover, another variation in the specifications is also explored by using non-overlapping five-year averages, but the results and story line are still the same (see Tables 11,12 and 13 in Annex D, for the results of these regressions).

⁵ F-test: If the sum of the coefficient (log GDP per capita) and coefficient (log GDP per capita*KAOPEN)=0, then, the level of development has no correlation with gross current account flows for countries with fully opened capital account.

D. Robustness

Table 6: Robustness Check by Adding Control Variables

Variables	Dependent Variable: Gross Current Account Inflows to GDP				
	(1)	(2)	(3)	(4)	(5)
Log GDP/capita (PPP) relative to US _(t-1)	0.0510 *** (0.0150)	-0.0282 (0.0304)	-0.0539 * (0.0321)	-0.0548 (0.0433)	-0.0582 ** (0.0281)
KAOPEN	-0.2002 *** (0.0587)	-0.0303 (0.0989)	-0.0700 (0.0987)	0.1359 (0.1803)	-0.0583 (0.0971)
Log GDP/capita _(t-1) *KAOPEN	0.0701 *** (0.0223)	0.0174 (0.0386)	0.0254 (0.0366)	-0.0352 (0.0584)	0.0197 (0.0364)
Banking Crisis	0.0100 * (0.0055)				
Official Development Assistance to GDP		0.6019 *** (0.2113)			
Private Credit to GDP			-0.0106 (0.0286)		
Political Risk				0.0751 (0.0622)	
Reserves to GDP _(t-1)					-0.1520 (0.0831)
Standard Controls	Yes	Yes	Yes	Yes	Yes
Observations	176	322	365	242	366
Countries	9	18	19	17	19
Fixed Effects	Yes	Yes	Yes	Yes	Yes
R-squared (within)	0.8935	0.5764	0.5542	0.4684	0.5452
R-squared (overall)	0.6671	0.5052	0.4479	0.2817	0.429
F-Test	131.76	40.01	41.77	18.95	40.39
p-value	0.0000	0.0000	0.0000	0.0000	0.0000

Standard errors are in parentheses, ***p<0.01, **p<0.05, *p<0.10

Source: Author's estimation

As a robustness check, there are several variables that are likewise to affect gross capital inflows aside from the vector of standard controls. Hence, there is a need to control for these variables (data description and data sources of these additional variables are found in Annex A). For instance, several countries in Asia experienced financial crisis during the sample period, which may bias the estimated coefficient; thus, there is a need to add a banking crisis indicator. Based on the results in Table 6, banking crises does not seem to bias the estimated coefficients in the previous section, as the coefficient of "Banking Crisis" indicator is weakly significant. The positive coefficient of the "Banking Crisis" indicator seem to explain that Asian countries seem to experience higher gross current account inflows, perhaps due to sharp current account reversals after the crisis. Another potential robustness variable is "Official Development Assistance (ODA) to GDP". Many relatively low-income countries in Asia received large official aid flows, especially during periods of financial reforms; this may bias the coefficient of the KAOPEN index downward. Meanwhile, as countries in Asia develop and liberalize their capital account, they also experience declining aid inflows, which may introduce an upward bias of the KAOPEN index, and an upward bias on the GDP per capita coefficient. Based on the results,

there is evidence that “ODA to GDP” has a slight downward bias on the KAOPEN index and the GDP per capita coefficient. The coefficient of “ODA to GDP,” however, seem to positively affect current account inflows and is positively significant. This makes sense as majority of the countries in the sample are relatively low-income countries, where a large proportion of capital flows are official flows, and these flows are not determined by the private rate of return on capital, but by social needs and humanitarian assistance considerations. Next, domestic financial development may also affect the current account. The effect, however, is theoretically ambiguous: a deeper and more efficient financial system may stimulate savings and therefore raise the current account, but it may also boost investment and therefore worsen the current account (Reinhardt, et al., 2010). A standard measure of financial development is “private credit to GDP”. Based on the results, “private credit to GDP” seems to positively affect gross current account flows; however, results are not significant. Controlling for “private credit to GDP” also makes the coefficients of the KAOPEN and the interaction term insignificant. Further, there are literature that point that the quality of property rights affects economic growth and financial development (Acemoglu and Johnson, 2005); hence, this paper considered a standard measure of property rights as proxied by a measure of political risk (or quality of institutions) from the International Country Risk Guide (ICRG). However, controlling for this political risk variable yields insignificant results in the estimation. Lastly, it is important to control for the role of reserve accumulation in shaping current account flows; hence, the inclusion of “reserves to GDP” variable. The role of reserve accumulation is still a relevant topic on global imbalances, especially when central banks use this as a policy move to maintain an undervalued real exchange rate (Blanchard and Milesi-Ferretti, 2009). The literature argues that, in the presence of capital market frictions, reserve accumulation lowers aggregate demand, and therefore, tend to raise the current account and to depreciate the real exchange rate. Based on the regression results, however, reserve accumulation in Asian countries is negatively associated with the current account and is not significant. It may be important to note that the estimated coefficient may be biased by reverse causality, and therefore should be interpreted with caution.

IV. Impact of Capital Account Openness on Economic Growth: Philippine Case

A. Model and Data

This section of the paper now shifts to the impact of financial liberalization on economic growth. This paper zooms into the case of capital account openness in the Philippines (which is part of the sample in the earlier panel) and how it affected Philippine economic growth, through the capital flows channel. This section is a modified growth model used in the past studies by Bayangos, et al., (2016), Tswamuno et al., (2007), Bekaert et al., (2004) and Li (2004). One of the distinguishing feature of this paper’s modification is the use of the KAOPEN in the modified specification, in contrast with that of the previous studies which only used time-based dummy variable (i.e., “0” for pre-liberalization period and “1” for post-liberalization period). The strength of this modified specification lies in the use of the KAOPEN, which also shows the intensity and degree of capital account liberalization. The modified specification is a fully interacted growth model as follows:

$$Y_t = \beta_0 + \beta_1 dlogPSEi_t + \beta_2 FPI/GDP_t + \beta_3 dlogPrivCredit/GDP_t + \beta_4 dlogTradeOpen/GDP_t + \alpha_1(dlogPSEi_t * KAOPEN_t) + \alpha_2(dlogFPI/GDP_t * KAOPEN_t) + \alpha_3(dlogPrivCredit/GDP_t * KAOPEN_t) + \alpha_4(dlogTradeOpen/GDP_t * KAOPEN_t) + \varepsilon_t$$

Y_t	Real GDP per capita growth at time "t"
$dlogPSEi_t$	First difference of the logarithm of the Philippine Stock Exchange index at time "t"
FPI/GDP_t	Net Foreign Portfolio flows to GDP at time "t"
$dlogPrivCredit/GDP_t$	First difference of the logarithm of domestic credit to private sector to GDP at time "t"
$\beta_4 dlogTradeOpen/GDP_t$	First difference of the logarithm of the sum of total imports and exports as a share of GDP at time "t"
$dlogPSEi_t * KAOPEN_t$ $dlogFPI/GDP_t * KAOPEN_t$ $dlogPrivCredit/GDP_t * KAOPEN_t$ $dlogTradeOpen/GDP_t * KAOPEN_t$	Interaction terms
ε_t	Error term

Note: Full description of the data and their sources are in Annex A: Data Description and Sources

To address the problem of unit root, the variables in the specification are transformed by taking the first difference of their logarithms. The independent variables in this specification are widely used variables that could proxy for capital account liberalization. While this specification captures the differential effect of these variables on economic growth, this study acknowledges that it is impossible to control for all non-liberalization causes of economic growth.

B. Findings

The results of the growth regression model in Table 7 confirm that the Philippine Stock Exchange index, net portfolio flows, credits to private sector, and trade openness all contributes positively and significantly to Philippine economic growth (see results of regression without interaction terms). When the degree of capita account openness is introduced in the model (fully-interacted OLS regression), the results confirm that KAOPEN matters for Philippine economic growth. With the inclusion of the interaction terms in the regression, the stock market, credits to private sector, and trade openness still positively and significantly contributes to economic growth. It is important, however, to interpret the results with caution. Accounting for the degree of capital account openness, the stock exchange index has a negative overall post-liberalization effect on economic growth (as implied by the sum of the coefficients of $dlogPSEi$ and its interaction with KAOPEN). The model predicts that a 1 percent increase in the growth rate of the stock exchange index results in a 0.26 percent decline in per capita GDP growth, assuming all factors are held constant. Same goes with other variables, accounting for the degree of capital liberalization, a 1 percent increase in FPI and trade openness results in a respective 4.69 percent and 0.20 percent, decline in real per capita GDP growth. Meanwhile, a 1 percent increase in credits to private sector results in a 0.15 increase in real GDP per capita (results for this variable is insignificant, however). These are in line with the results of previous studies in this field. Nonetheless, it may be encouraging to note that, even when KAOPEN is introduced in the model, the stand-alone coefficients of stock market index, FPI and trade openness still positively and significantly affects real GDP per capita in the Philippines.

Table 7: Impact of Capital Account Liberalization on Philippine Economic Growth

Dependent variable: Real GDP per capita growth		
Variables	without interaction terms	with interaction terms
dlogPSEi	0.0603 *** (0.0077)	0.3148 *** (0.0053)
FPI/GDP	0.3802 ** (0.1306)	4.4418 *** (0.0631)
dlog Private Credit/GDP	0.0569 * (0.0274)	-0.0230 (0.0422)
dlog Trade Openness/GDP	0.0515 ** (0.0221)	0.2462 *** (0.0141)
dlog PSEi * KAOPEN		-0.5736 *** (0.0226)
FPI/GDP * KAOPEN		-9.1376 *** (0.3425)
dlog Private Credit/GDP * KAOPEN		0.1746 (0.1423)
dlog Trade Openness/GDP * KAOPEN		-0.4462 *** (0.0840)
Diagnostics		
Adjusted R-squared (within)	0.8396	0.9349
Breusch-Pagan Serial Correlation Test	Stable residual	Stable residual
Cointegration Test (ADF)	Cointegrated	Cointegrated
Estimation Period	1973 to 2015 (Annual)	
Method	Ordinary Least Squares	
Robust standard errors are in parentheses, ***p<0.01, **p<0.05, *p<0.10		
Source: Author's estimation		

V. Conclusion and Policy Implications

This paper explores how capital account openness influence capital flows and economic growth. With respect to establishing the impact of capital account openness on capital flows, several panel regression specifications were conducted to fully exploit the influence of capital account liberalization on gross current account inflows in Asia. Nonetheless, the results point to one main findings: capital account liberalization matters on capital flows dynamics.

The first estimation is regression by income groups in Asia. This revealed that there is a positive and significant relationship between real GDP per capita and gross current account inflows across income groups in Asia. Findings for the low- and lower-middle income groups in Asia are consistent with the neoclassical view of capital flows (i.e., relatively poorer countries tend to experience capital inflows). Accounting for degree of capital account openness (i.e., adding the coefficients of real GDP per capita and the interaction term), results in the reduction in the gross capital inflows across income groups.

The second variation in the specification is looking at full sample regression (without income groupings) and adding the standard vector of control variables. With this specification, there is a positive and significant relationship between the level of GDP per capita and gross current account inflows. The variable KAOPEN have the expected positive sign in this specification, but results are not significant. The interaction term yields a net positive and slightly significant

result, suggesting that, the effect of income for countries with open capital account in Asia results in capital inflow. Given that most countries in Asia (that are included in the panel) are relatively poor, the results coincide with the prediction of the neoclassical theory in this specification.

The third variation in the specification, and perhaps the most practical, is the regression where Asian countries are grouped by the degree of capital account openness. The “Low KAOPEN” group is mostly composed of relatively poor countries in the panel. For the “Low KAOPEN” group, the interaction term yields a net positive coefficient. This is consistent with the prediction of the neoclassical theory that, relatively poor countries should tend to experience net capital inflows when the degree of capital account openness is considered. On the other hand, the “High KAOPEN” group is mostly consisted of relatively high-income countries in the panel. For this group, the interaction term yields a net negative and significant result. This confirms the neoclassical prediction that relatively richer countries should tend to experience net capital inflows (in this case, a reduction in inflows) when the degree of capital account openness is considered.

Based on the regression results, the most sensible interpretation can be derived when countries were grouped based on the degree of capital openness. Low KAOPEN group in Asia, which consist of relatively poorer countries, experienced capital inflows during the review period. Meanwhile, the High KAOPEN group, majority of which are relatively richer countries, experienced a reduction in capital inflows during the review period. From these results, it can be concluded that the neoclassical view of capital flows is confirmed when relatively poorer countries have slightly open capital account, and when relatively richer countries have greatly open capital account. This leads to the point that policymakers in Asia needs to consider both the country’s level of income and the degree of capital account openness in crafting their economic policy toolkit.

The control variables that seem to significantly affect the current account dynamics are fiscal balance to GDP, old-age dependency ratio, population growth, net foreign assets to GDP, oil trade balance to GDP, and exports to GDP.

With respect to the impact of capital account openness on economic growth, a fully-interacted growth regression model is estimated for the Philippines. The results of the estimation likewise confirm that, indeed, capital account liberalization matters to economic growth (at least in the case of the Philippines). Even when the degree of capital account openness is fully interacted in the model, proxies for financial development yields positive coefficients, indicating their positive contribution to real per capita GDP growth of the Philippines. Based on the results of the fully-interacted growth model for the Philippines, when the KAOPEN index is interacted in the model, the financial sector variables such as the stock exchange index, foreign portfolio investments to GDP, and trade openness to GDP appear to have a detrimental impact on real GDP per capita growth. Given that the Philippines is a lower-middle income country, it may be convenient policy for relatively poorer countries to open their capital account as a means to attract capital inflows, following the neoclassical theory on capital flows. However, in the case of the Philippines, the opening of the capital account was found to have a dampening impact on economic growth through the financial sector channels (i.e., stock market, portfolio flows and trade flows). This brings to the inference that, for policymakers, caution should be taken in prescribing policies with respect to capital account liberalization. As the level of development differs from country to country, policy prescription on capital account liberalization should

therefore be country specific and should be in harmony with domestic economic objectives and policies.

From a public-policy standpoint, since capital account liberalization were found to have significant impact on capital flows and economic growth, policymakers and institutions should therefore handle the changes and timing of their liberalization policies. Policymakers should, as much as possible, strike a balance between calibrating their liberalization policies in tune with their domestic economic policies. As found in this paper, countries are better placed to benefit from capital account liberalization, conditional on the country's level of economic and institutional development. Countries must therefore be prepared to have the right mix of policies that could handle the risks associated with capital flow dynamics. Liberalization measures needs to be well planned, timed, and sequenced as it could have significant domestic and multilateral effects or "spillovers". This brings to the point that there is no solid presumption that full capital account liberalization is appropriate for most countries, and that institutional capacity, macroeconomic fundamentals, and safety net measures should likewise be considered.

VI. Limitations

In the past, measuring the degree of capital account liberalization was extremely difficult. This posed a challenge across academic circles in estimating the effect of financial liberalization policies on economic performance. There are reasons why it is extremely difficult to measure the extent of capital account controls as identified by Chinn and Ito (2005): First, conventional measures for quantifying capital controls (or openness) fail to account for the intensity of capital controls. The most prominent example of such measures includes binary variables based upon the IMF's categorical enumeration reported in AREAER. Second, IMF-based variables are too aggregated to capture the subtleties of actual capital controls. Capital controls can differ depending on the direction of capital flows (i.e., inflows or outflows) as well as the type of financial transactions targeted. Thirdly, it is almost impossible to distinguish between *de jure* and *de facto* controls on capital transactions. Capital control policies are often implemented without explicit policy goals to control the volume and/or type of capital flows.

This paper uses KAOPEN index to measure capital account openness. The KAOPEN index uses principal component analysis which takes on a higher value when a country is more open to cross-border transactions. However, the KAOPEN does not distinguish between controls on capital outflows and inflows on the disaggregated basis. This serves as limitation to the predictive power of the regressions in this paper.

While the KAOPEN index devised by Chinn and Ito (2007) was able to address the issue of incorporating the intensity of the controls, several features of the KAOPEN index could still be improved. Future research could be done to capture the subtleties of capital controls, that is, to create sub-measures in the KAOPEN index that would discuss controls depending on the direction of capital flows (i.e., inflows/outflows) and distinguish controls depending on the type of financial transactions. KAOPEN index can also be further improved to distinguish *de jure* and *de facto* controls on capital transactions. However, this would only be possible if data is available.

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Annex A: Data Description and Data Sources

Variable	Data	Source
Gross Current Account Inflows to GDP	Represents the sum of current account inflows for goods and services, primary income flows and secondary income flows as a percent of GDP.	Balance of Payments Statistics, International Financial Statistics (IFS), International Monetary Fund (IMF)
Net Current Account to GDP	Current account balance as a percent of GDP	Balance of Payments Statistics, IFS, IMF
Real GDP per capita (PPP) relative to the US	Relative Income per capita is PPP income per capita relative to the U.S., both in constant 2005 international Dollars. The index has a value of 100 for the US.	Penn World Tables 6.3
KAOPEN (Capital Account Openness) index	Chinn and Ito (2008) index for capital account openness updated up to 2015.	Chinn and Ito 2015 updated database: http://web.pdx.edu/~ito/Chinn-Ito_website.htm
FLI (Financial Liberalization index)	The domestic financial reform measure is an index, coded between 0 and 1.	Abiad et al., (2008)
Fiscal Balance to GDP	The general government balance relative to GDP, using the central government balance for countries where the general balance is not available.	World Economic Outlook (WEO)
Net Foreign Assets to GDP	Net foreign assets are the sum of foreign assets held by monetary authorities and deposit money banks, less their foreign liabilities (computed as percent of GDP).	IFS, IMF
Old-age dependency ratio	Captures the share of people older than 64, relative to the working age population, defined as the age group 15-64	World Bank staff estimates based on age distributions of United Nations (UN) Population Division's World Population Prospects: 2017 Revision.
Population growth	Growth of the population by country	The population growth data are computed from World Bank data, extended with UN projections.
Oil Trade Balance to GDP	Ratio of oil and petroleum trade balance to GDP	www.trademap.org
Exports to GDP	Ratio of exports of goods and services to GDP	Balance of Payments Statistics, IFS, IMF
Imports to GDP	Ratio of imports of goods and services to GDP	Balance of Payments Statistics, IFS, IMF
Banking Crisis	The measure for banking crises is based on an updated version of the dummy variable constructed by Carmen Reinhart.	http://www.carmenreinhart.com/data/browse-by-topic/topics/7/
Political Risk	To proxy institutional quality, a composite index measuring political risk is used.	International Country Risk Guide
Official Development	Net official development assistance (ODA)	Development Assistance

Variable	Data	Source
Assistance to GDP	consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants (computed as percent of GDP)	Committee of the Organisation for Economic Co-operation and Development, Geographical Distribution of Financial Flows to Developing Countries, Development Co-operation Report, and International Development Statistics database. Data are available online at: www.oecd.org/dac/stats/ids/online .
Private credit to GDP	Represents Private Credit by Deposit Money Banks and Other Financial Institutions relative to GDP	WDI
Reserves to GDP	Reserves and related items is the net change in a country's holdings of international reserves resulting from transactions on the current, capital, and financial accounts (computed as percent of GDP)	Balance of Payments Statistics, IFS, IMF
Philippine Stock Exchange index (PSEi)	Philippine stock market index of the Philippines	Bloomberg, WDI
Trade Openness to GDP	Sum of total imports and exports as a share of GDP	Balance of Payments Statistics, IFS, IMF

Annex B: Summary Statistics and Correlations

Variable		Mean	Std. Dev.	Min	Max	Observations
Gross Current Account Inflows to GDP	overall	0.4161	0.3705	0.0213	2.2875	N = 642
	between		0.3511	0.0538	1.2197	n = 19
	within		0.1305	-0.0512	1.4839	T-bar = 33.7895
Net Current Account to GDP	overall	-0.0032	0.1372	-2.4052	0.5467	N = 703
	between		0.0614	-0.1150	0.1950	n = 19
	within		0.1235	-2.6035	0.3484	T = 37
Log real GDP per capita (PPP) relative to the US	overall	2.7440	1.0684	0.8463	5.1158	N = 577
	between		1.0789	0.9446	4.3910	n = 19
	within		0.2242	2.0455	3.7496	T = 30.3684
KAOPEN	overall	0.5414	0.3476	0.0000	1.0000	N = 696
	between		0.3047	0.1254	0.9851	n = 19
	within		0.1825	0.0444	0.9554	T-bar = 36.6316
Fiscal Balance to GDP	overall	-0.0284	0.1066	-1.5131	0.4330	N = 495
	between		0.0449	-0.1448	0.0830	n = 19
	within		0.0970	-1.6244	0.3217	T-bar = 26.0526
Old-Age Dependency Ratio	overall	0.0872	0.0546	0.0000	0.4391	N = 703
	between		0.0499	0.0227	0.2483	n = 19
	within		0.0249	-0.0290	0.2780	T = 37
Population Growth	overall	0.0207	0.0144	-0.0309	0.0777	N = 703
	between		0.0106	0.0025	0.0385	n = 19
	within		0.0100	-0.0473	0.0687	T = 37
Net Foreign Assets to GDP	overall	0.2257	0.3044	-0.3311	2.7388	N = 664
	between		0.2563	-0.0028	0.9845	n = 19
	within		0.1870	-0.3507	1.9801	T-bar = 34.9474
Oil Trade Balance to GDP	overall	0.0058	0.0854	-0.3053	0.4754	N = 686
	between		0.0542	-0.0825	0.1532	n = 19
	within		0.0667	-0.2171	0.3279	T-bar = 36.1053
Exports to GDP	overall	0.4220	0.2633	0.0316	1.6636	N = 640
	between		0.2372	0.1195	0.8620	n = 19
	within		0.1246	0.0106	1.2577	T-bar = 33.6842
Imports to GDP	overall	0.4370	0.2592	0.0857	2.0902	N = 640
	between		0.2320	0.1325	0.8500	n = 19
	within		0.1374	0.0950	1.6771	T-bar = 33.6842
Banking Crisis	overall	0.2523	0.4350	0.0000	1.0000	N = 333
	between		0.0740	0.1351	0.3784	n = 9
	within		0.4293	-0.1261	1.1171	T = 37
Official Development Assistance to GDP	overall	0.0288	0.0494	-0.0062	0.4924	N = 594
	between		0.0343	0.0001	0.1095	n = 18
	within		0.0357	-0.0639	0.4398	T-bar = 33
Private Credit to GDP	overall	0.5788	0.4001	0.0034	1.9090	N = 659

	between		0.3498	0.0783	1.3359	n = 19
	within		0.2097	0.0244	1.3057	T-bar = 34.6842
Political Risk	overall	0.6793	0.1764	0.1667	1.0000	N = 342
	between		0.1617	0.3565	0.8651	n = 17
	within		0.0833	0.4895	0.9571	T-bar = 20.1176
Reserves to GDP	overall	0.0130	0.0557	-0.2294	0.4662	N = 640
	between		0.0256	-0.0666	0.0718	n = 19
	within		0.0508	-0.1878	0.4436	T-bar = 33.6842

Pairwise Correlations

	Gross Current Account Inflows	Net Current Account to GDP	Log real GDP per capita relative to US	KAOPEN	Fiscal Balance to GDP	Old-Age Dependency Ratio	Population Growth	Net Foreign Assets to GDP	Oil Trade Balance to GDP	Exports to GDP	Imports to GDP
Gross Current Account Inflows	1										
Net Current Account to GDP	0.0424 (0.2832)	1									
Log real GDP per capita relative to US	0.3634 (0.0000)	0.1860 (0.0000)	1								
KAOPEN	0.4842 (0.0000)	0.0481 (0.2047)	0.5571 (0.0000)	1							
Fiscal Balance to GDP	-0.0146 (0.7535)	0.7896 (0.0000)	0.0872 (0.0892)	-0.1001 (0.0262)	1						
Old-Age Dependency Ratio	-0.2751 (0.0000)	-0.0421 (0.2644)	0.2669 (0.0000)	0.0518 (0.1723)	-0.1082 (0.0160)	1					
Population Growth	0.4401 (0.0000)	0.1535 (0.0000)	0.0611 (0.1426)	0.2132 (0.0000)	0.2638 (0.0000)	-0.4701 (0.0000)	1				
Net Foreign Assets to GDP	0.3297 (0.0000)	0.0376 (0.3340)	0.2677 (0.0000)	0.3825 (0.0000)	-0.1777 (0.0001)	-0.1093 (0.0048)	0.2213 (0.0000)	1			
Oil Trade Balance to GDP	-0.0898 (0.0229)	0.2887 (0.0000)	0.1111 (0.0085)	-0.0174 (0.6509)	0.3650 (0.0000)	-0.1614 (0.0000)	0.0963 (0.0116)	0.1485 (0.0001)	1		
Exports to GDP	0.7857 (0.0000)	0.1016 (0.0101)	0.2961 (0.0000)	0.4062 (0.0000)	0.1116 (0.0161)	-0.2891 (0.0000)	0.3215 (0.0000)	0.3434 (0.0000)	0.0553 (0.1623)	1	
Imports to GDP	0.7391 (0.0000)	-0.2587 (0.0000)	0.1205 (0.0061)	0.3242 (0.0000)	-0.2038 (0.0000)	-0.2469 (0.0000)	0.2988 (0.0000)	0.3149 (0.0000)	-0.1151 (0.0036)	0.8639 (0.0000)	1

Note: p-values are in parentheses

Source: Author's estimation

Annex C: Regression Results Using “Net Current Account Flows to GDP” as Dependent Variable

**Table 8: Capital Flows and Capital Account Openness in Asia by Income Groups
(using Net Current Account to GDP; Panel Fixed Effects)**

Variables	Dependent: Net Current Account to GDP			
	Countries by Income Groups			
	Low	Lower Middle	Upper Middle	High
Log GDP/capita (PPP) relative to US_(t-1)	0.0720 ** (0.0357)	0.0629 *** (0.0239)	0.8687 *** (0.1678)	-0.2210 (0.2073)
KAOPEN	0.2702 * (0.1426)	0.1808 * (0.1100)	2.4959 *** (0.5359)	-4.5804 *** (1.4688)
Log GDP/capita_(t-1)*KAOPEN	-0.2531 ** (0.1164)	-0.0965 ** (0.0491)	-0.8005 *** (0.1668)	1.1041 *** (0.3653)
Observations	93	213	149	118
Countries	3	7	5	4
Country Fixed Effects	Yes	Yes	Yes	Yes
R-squared (within)	0.056	0.3405	0.3767	0.4045
R-squared (overall)	0.0008	0.3299	0.3141	0.3275
F-Test	1.72	2.71	2.03	1.67
p-value	0.1690	0.0000	0.0033	0.0330

Standard errors are in parentheses, ***p<0.01, **p<0.05, *p<0.10

Source: Author’s estimation

**Table 9: Capital Flows and Capital Account Openness in Asia
(using Net Current Account to GDP; Pooled OLS and Panel Fixed Effects Regression)**

Variables	Dependent Variable: Net Current Account to GDP							
	OLS	FE	OLS	FE	OLS	FE	OLS	FE
Log GDP/capita (PPP) relative to US_(t-1)	0.0355 *** (0.0090)	0.1098 *** (0.0237)	0.0379 *** (0.0141)	0.1070 *** (0.0268)	-0.0135 ** (0.0068)	-0.0245 *** (0.0096)	0.0002 (0.0072)	-0.0106 (0.0126)
KAOPEN			-0.1089 * (0.0643)	-0.0412 (0.0915)	-0.0157 (0.0112)	-0.0180 (0.0117)	-0.1016 *** (0.0339)	0.0859 ** (0.0429)
Log GDP/capita_(t-1)*KAOPEN			0.0137 (0.0214)	-0.0086 (0.0307)			0.0290 *** (0.0113)	-0.0373 ** (0.0157)
Fiscal balance to GDP					0.1187 *** (0.0319)	0.1055 *** (0.0311)	0.3837 *** (0.0533)	0.0707 ** (0.0344)
Old-age dependency ratio					-0.0171 (0.1063)	-0.0488 (0.1382)	-0.2344 *** (0.0860)	-0.0180 (0.1539)
Population growth					-0.9184 *** (0.2045)	-0.9676 *** (0.2057)	-0.6999 ** (0.2908)	-0.9315 *** (0.2122)
Net Foreign Assets to GDP _(t-1)					0.0860 *** (0.0156)	0.0899 *** (0.0160)	0.0315 (0.0199)	0.0983 *** (0.0178)
Oil trade balance to GDP					0.0098 (0.0277)	0.0045 (0.0273)	-0.0698 ** (0.0361)	0.0055 (0.0282)
Exports to GDP					0.7680 *** (0.0287)	0.8071 *** (0.0290)	0.3461 *** (0.0342)	0.8053 *** (0.0325)
Imports to GDP					-0.8073 *** (0.0303)	-0.8346 *** (0.0303)	-0.3820 *** (0.0382)	-0.8509 *** (0.0352)
Observations	577	577	573	573	368	368	368	368
Countries	19	19	19	19	19	19	19	19
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
R-squared (within)	0.0371	0.0371	0.0337	0.0423	0.8045	0.8059	0.8054	0.8263
R-squared (overall)	0.0409	0.0409	0.059	0.0472	0.6052	0.5714	0.5986	0.5394
Wald chi2	15.52		24.37		1324.9		1332.73	
F-Test		21.48		8.11		156.82		36.76
p-value	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Standard errors are in parentheses, ***p<0.01, **p<0.05, *p<0.10

Source: Author’s estimation

**Table 10: Capital Flows and Capital Account Openness in Asia by Degree of Openness
(using Net Current Account to GDP; Panel Fixed Effects Regression)**

Variables	Dependent Variable: Net Current Account to GDP							
	Low	High	Low	High	Low	High	Low	High
Log GDP/capita (PPP) relative to US_(t-1)	0.0319 *** (0.0095)	0.2019 *** (0.0471)	0.0375 *** (0.0112)	0.2461 *** (0.0736)	0.0153 ** (0.0065)	-0.0374 * (0.0202)	-0.0216 *** (0.0069)	-0.0637 ** (0.0348)
KAOPEN			0.0108 (0.0446)	0.2211 (0.2166)	0.0095 (0.0101)	-0.0412 ** (0.0193)	-0.0520 * (0.0278)	0.0424 (0.0950)
Log GDP/capita_(t-1)*KAOPEN			-0.0111 (0.0189)	-0.0834 (0.0654)			0.0278 ** (0.0118)	-0.0320 (0.0344)
Fiscal balance to GDP					-0.1415 *** (0.0550)	0.1313 *** (0.0434)	-0.1312 ** (0.0544)	0.0953 ** (0.0471)
Old-age dependency ratio					-0.5813 *** (0.1788)	-0.0517 (0.2050)	-0.8807 *** (0.2170)	-0.1080 (0.2195)
Population growth					-2.5193 *** (0.4624)	-0.9325 *** (0.2829)	-3.0721 *** (0.5122)	-0.6885 ** (0.2795)
Net Foreign Assets to GDP _(t-1)					0.0488 *** (0.0153)	0.1134 *** (0.0262)	0.0559 *** (0.0154)	0.1764 *** (0.0285)
Oil trade balance to GDP					-0.1408 ** (0.0643)	-0.0019 (0.0393)	-0.1563 ** (0.0638)	0.0053 (0.0393)
Exports to GDP					0.8757 *** (0.0364)	0.7745 *** (0.0425)	0.8943 *** (0.0368)	0.8054 *** (0.0465)
Imports to GDP					-0.8695 *** (0.0355)	-0.8326 *** (0.0451)	-0.8844 *** (0.0355)	-0.9300 *** (0.0544)
Observations	279	298	276	297	175	192	176	192
Countries	9	10	9	10	9	10	9	10
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (within)	0.04	0.0601	0.0432	0.0619	0.8512	0.8101	0.8563	0.8664
R-squared (overall)	0.0347	0.0683	0.0393	0.0675	0.7133	0.5643	0.7295	0.4322
F-Test	11.2	18.36	3.97	6.25	100.42	81.98	93.57	26.3
p-value	0.0009	0.0000	0.0086	0.0004	0.0000	0.0000	0.0000	0.0000

Standard errors are in parentheses, ***p<0.01, **p<0.05, *p<0.10

Source: Author's estimation

Annex D: Regression Results Using Non-Overlapping 5-Year Averages

**Table 11: Capital Flows and Capital Account Openness in Asia by Income Groups
(using Non-Overlapping 5-Year Averages; Panel Fixed Effects)**

Variables	Dependent: Gross Current Account Inflows to GDP			
	Countries by Income Groups			
	Low	Lower Middle	Upper Middle	High
Log GDP/capita (PPP) relative to US_(t-1)	0.2053 ** (0.0375)	0.0937 *** (0.0212)	-0.7936 (0.7445)	0.4660 *** (0.0624)
KAOPEN	1.2222 ** (0.2309)	0.5163 * (0.2532)	-2.8457 (2.7038)	2.6612 ** (0.7128)
Log GDP/capita_(t-1)*KAOPEN	-0.5800 ** (0.0728)	-0.2286 * (0.1158)	0.7971 (0.7984)	-0.6255 ** (0.1734)
Observations	19	49	31	25
Countries	3	7	5	4
Fixed Effects	Yes	Yes	Yes	Yes
R-squared (within)	0.6168	0.1115	0.1161	0.7508
R-squared (overall)	0.3031	0.0004	0.0786	0.1631
F-Test	6.97	6.86	0.73	4.02
p-value	0.0049	0.0229	0.5858	0.0141

Standard errors are in parentheses, ***p<0.01, **p<0.05, *p<0.10

Source: Author's estimation

**Table 12: Capital Flows and Capital Account Openness in Asia
(using Non-Overlapping 5-Year Averages; Panel Fixed Effects)**

Variables	Dependent Variable: Gross Current Account Inflows to GDP			
	(1)	(2)	(3)	(4)
Log GDP/capita (PPP) relative to US_(t-1)	0.1130 ** (0.0462)	0.1209 ** (0.0532)	-0.0719 ** (0.0321)	-0.1195 *** (0.0367)
KAOPEN		0.0457 (0.1757)	-0.0551 (0.0481)	-0.4176 *** (0.1550)
Log GDP/capita_(t-1)*KAOPEN		-0.0088 (0.0560)		0.1387 ** (0.0566)
Fiscal balance to GDP			-0.1749 (0.1116)	-0.1192 (0.1105)
Old-age dependency ratio			0.1324 (0.3138)	-0.0203 (0.3105)
Population growth			-2.2382 ** (0.8963)	-2.4275 *** (0.8723)
Net Foreign Assets to GDP _(t-1)			0.1658 *** (0.0566)	0.1822 *** (0.0552)
Oil trade balance to GDP			0.2813 ** (0.1225)	0.3003 ** (0.1190)
Exports to GDP			0.7890 *** (0.0798)	0.8139 *** (0.0780)
Observations	124	124	105	105
Countries	19	19	19	19
Fixed Effects	Yes	Yes	Yes	Yes
R-squared (within)	0.1778	0.1791	0.6412	0.6671
R-squared (overall)	0.1459	0.1586	0.2702	0.3655
F-Test	3.03	2.33	17.42	17.15
p-value	0.0064	0.0205	0.0000	0.0000

Standard errors are in parentheses, ***p<0.01, **p<0.05, *p<0.10

Source: Author's estimation

**Table 13: Capital Flows and Capital Account Openness in Asia by Degree of Openness
(using Non-Overlapping 5-Year Averages; Panel Fixed Effects)**

Variables	Dependent Variable: Gross Current Account Inflows to GDP							
	Low	High	Low	High	Low	High	Low	High
Log GDP/capita (PPP) relative to US_(t-1)	0.1134 *** (0.0267)	-0.0380 (0.0805)	0.0984 *** (0.0284)	-0.1452 (0.1348)	-0.0101 (0.0217)	-0.0836 (0.0704)	-0.0188 (0.0225)	-0.1414 (0.1045)
KAOPEN			0.2298 (0.1487)	-0.3432 (0.3767)	0.0662 (0.0423)	-0.1063 (0.0760)	-0.1466 (0.1677)	-0.3448 (0.3265)
Log GDP/capita_(t-1)*KAOPEN			-0.0130 (0.0520)	0.0811 (0.1113)			0.0747 (0.0570)	0.0884 (0.1177)
Fiscal balance to GDP					-0.1326 (0.3127)	-0.1630 (0.1305)	-0.0757 (0.3124)	-0.1400 (0.1348)
Old-age dependency ratio					0.8197 ** (0.3283)	-0.1709 (0.3960)	0.3163 (0.5030)	-0.1735 (0.3984)
Population growth					-5.8625 *** (1.6852)	-2.6939 ** (1.0632)	-6.7655 *** (1.8040)	-2.6107 ** (1.0753)
Net Foreign Assets to GDP _(t-1)					-0.0860 (0.0527)	0.3074 *** (0.0809)	-0.0639 (0.0548)	0.3063 *** (0.0814)
Oil trade balance to GDP					-0.1862 (0.2277)	0.1821 (0.1500)	-0.1668 (0.2258)	0.2225 (0.1602)
Exports/GDP					0.3209 *** (0.0704)	1.1021 *** (0.1215)	0.3474 *** (0.0726)	1.0850 *** (0.1243)
Observations	61	63	61	63	50	55	50	55
Countries	9	10	9	10	9	10	9	10
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (within)	0.2612	0.0043	0.3967	0.029	0.7906	0.7585	0.8013	0.7622
R-squared (overall)	0.0708	0.0011	0.0629	0.0018	0.1005	0.5427	0.1682	0.5574
F-Test	18.03	0.22	10.74	0.5	15.57	14.52	14.34	12.82
p-value	0.0001	0.6394	0.0000	0.6857	0.0000	0.0000	0.0000	0.0000

Standard errors are in parentheses, ***p<0.01, **p<0.05, *p<0.10

Source: Author's estimation