IR2018-3

The Effects of International Capital Flows on Domestic Savings, Investment and Growth: Changes in the 'F-H Puzzle' in Emerging Economies

Hideaki Ohta[*]

21 December 2018

*立命館大学国際関係学部教授

The Effects of International Capital Flows on Domestic Savings, Investment and Growth: Changes in the 'F-H Puzzle' in Emerging Economies

Hideaki Ohta[※]

Abstract

This paper analyses the overall changes in the saving/investment/capital inflows relationship as well as economic growth under increasing international capital flows in emerging economies during the period from1980 to 2017. This paper attempts to examine whether the 'Feldstein-Horioka(FH) puzzle' would still hold in emerging countries during the period. Originally, Feldstein-Horioka (FH) (1980) could not find any fact that domestic savings and investment had less association during capital account liberalization, but they found that domestic savings maintained a significant association/ correlation with domestic investment in major OECD countries during the period 1960 and 1974. This paper also focuses on the association between domestic savings and capital flows, as well as GDP growth in 25 emerging economies/ countries during the 'Post' F-H puzzle period until recently.

The analysis in this paper found that i) the correlation between savings and investment has been significantly affected by the capital account liberalization in the past decades, however, the correlation nexus of domestic savings and investment has not been changed significantly in emerging economies during the whole period.;
ii) In the post-Global Financial Crisis period (2010-17) the correlation between savings and investment has recovered; the correlation between savings and investment has been generally higher in the Post Global Financial Period (2010-17) in emerging countries.
iii) Capital inflows have not had positive and significant correlation with domestic investment and GDP growth; iv) Large emerging economies have higher correlation between savings and investment, than that of total sample of emerging economies.

The overall results of the analysis in this paper show that Feldstein-Horioka puzzle of home bias somehow still hold even in recent decades when capital account openness in each country has drastically increased in emerging economies. Smaller countries with capital account and financial liberalization among emerging economies tend to have been more affected by capital flows on domestic savings and investment, as well as GDP growth. The results of this paper also indicate that domestic savings would be still one of the major factors for domestic investment for growth, and that capital inflows and external trade would not guarantee domestic investment and GDP growth in emerging countries.

Keywords: F-H puzzle, Domestic Savings, Domestic Investment, Capital Account
　　　　　Liberalization, GDP growth

Introduction

This paper analyses the overall changes in the savings/ investment/ capital inflows relationship as well as economic growth under increasing international capital flows in emerging economies during the period from1970s to 2010s. In general, the domestic investment-saving nexus has become weaker in recent decades both in advanced economies (OECD) and emerging economies.

Domestic saving and investment ratios are closely related in principle in any country, however, the correlation is not always clear under the increasing global capital flows.

[※] Professor, College and Graduate School of International Relations, Ritsumeikan University

1

Increased domestic savings may not result in higher domestic investment in the real economy, since investment in the financial sector for short-term speculative investment is commonly observed in many countries recently, especially advanced and emerging countries when investment in non-productive sectors such as financial investment real estates. As a result, growth in capital inflows have not contributed to the economic growth in many countries.

The pioneering work done by Feldstein-Horioka (1980) (hereafter, FH） analysed the relationship between domestic savings and investment during the period which capital flows were relatively limited between 1960 and 1974. The FH analysis indicated that the correlation between domestic savings and investment in OECD countries was still high during the period, which is contrary to the assumed hypothesis that the correlation between domestic savings and investment was expected to become lower under the capital account liberalization. The result was explained by some institutional constraints as well as home bias of each country among the OECD. This is called 'Feldstein-Horioka (hereafter F-H) puzzle.

The results of FH analyses are plausible if we consider the period covered in the analysis is 1960-1974, during which most of the OECD nations had not liberalized capital account in the covered period, and it was only after the mid-1980s that major advanced economies including European countries and Japan undertook capital account liberalization. However, the F-H puzzle might have already been solved since the correlation between saving and investment has steadily declined with increasing capital flows under the capital account liberalization in the past decades.

This paper will examine whether such a hypothesis of FH has become valid in explaining the changes in relationships between domestic savings and investment under increasing capital flows in emerging economies during the past decades in view of the importance of domestic investment utilizing domestic savings. It is also shown that the importance of capital management and controls in several countries in attaining positive correlation between domestic savings and investment for stable growth.

It should be noted that very few relevant literatures have analysed the FH hypothesis covering emerging economies in recent period, especially during 2000s and 2010s. The variables taken up by several research papers are complicated, which may not necessarily be applicable in many countries.

In this paper, the analyses include multiple regression equations which include those variables as domestic savings, total trade (exports/imports as the share among GDP), as well as financial inflows (net, percent of GDP), covering the period between 1980 and 2017. This paper also takes up the nexus of domestic savings and GDP growth, together with other variables as domestic investment, trade and capital flows (net, percent of GDP).

Although financial inflows were not used as one of the explanatory variables in the F-H hypothesis, it is useful to explain how the domestic investment has become dependent on the imported financial capital. This is because capital flows in the global market have increased in the past three decades, which would justify using the variable of capital flows (FDI, portfolio and other investment) in the regression equations. Among the explanatory variables, trade (exports/imports) variables could be significance in the regression equations, during the period which international trade was the major element in the international transactions. However, the correlation between domestic savings and investment ratios in selected emerging 25 countries become insignificant since late 1990s until 2000s, while the trend has reversed recently[1]. The analysis in this paper also indicates that the effects of capital inflows on the domestic savings/investment are larger in small economies as

---

[1] The countries include Korea, Israel, Korea, Singapore which are now advanced economies, but these countries had been categorized 'emerging' economies until 1990s, so that these are included in the 25 countries.

compared with large economies among the emerging economies.

The capital inflows generally put positive effects on domestic savings in those countries with capital management and controls, and naturally an increase in savings could contribute to achieve higher GDP growth rate. in this paper, the relationship between domestic savings and GDP growth is also analysed and the result shows that domestic savings are not always correlated with domestic savings and GDP growth, and that this could be because capital flows between the countries have increased significantly. The analysis also found that the positive correlation between domestic savings and investment has become significant, while that of financial flows and GDP growth insignificant in recent years (2010-2017) in emerging economies. In the post-Lehman shock period since 2010-17, the management and control of capital flows might have been worked effectively though several prudential controls in emerging countries.

The results of analyses in this paper suggest that accumulation of domestic savings is important for a country to attain stable growth, and cautious approach towards capital account liberalization would be required to maximize the benefit of resources.

1. The Roles of Savings and Investment under Increased Capital Flows in Economic Development

1.1 Feldstein-Horioka Puzzle: Pioneering Research on the nexus of Savings and Investment

The original hypothesis proposed by F-H was the correlation between national saving and investment would become less apparent as capital account liberalization in 21 OECD countries taken place, and the analysis was made based on the regression equation, and the model assumes that the coefficient (β) should become smaller towards zero under the condition that capital account liberalization of country i is totally undertaken and capital flows among the nations are fully realized.

$$(I/Y)_i = \alpha + \beta(S/Y)_i \tag{1}$$
$(I/Y)_i$: domestic investment as percentage of GDP;
$(S/Y)_i$: domestic savings as percentage of GDP

The coefficient (β) during 1960-74 is 0.89（standard error: 0.07）indicated that capital mobility among the advanced nations was still limited, and that domestic investment is mostly explained by the domestic savings in OECD (Table 1). This indicates that there still existed strong 'home bias' in the sense that domestic savings (resources) to be utilized for investment in advanced countries until mid-1970s. The results shown by F-H (1980) may be natural outcome since the covered period was 1960-1974 when capital account liberalization was not commonly adopted in many OECD countries.

Table1：Domestic Investment and Savings（F=H）[1980]

【Dependent Variable】	①Gross Domestic Investment			②Net Domestic Investment		
	Constant	S/Y（β）	R^2	Constant	S/Y（β）	R^2
1960-74	0.035 (0.018)	0.887 (0.074)	0.91	0.017 (0.014)	0.938 (0.091)	0.87
1960-64	0.029 (0.015)	0.909 (0.060)	0.94	0.017 (0.011)	0.936 (0.072)	0.91
1965-69	0.039 (0.025)	0.872 (0.101)	0.83	0.022 (0.020)	0.908 (0.133)	0.75
1970-74	0.039 (0.024)	0.871 (0.092)	0.85	0.018 (0.018)	0.932 (0.107)	0.83

Note: Countries covered are OECD member nations (21).
Source: M.Feldstein; C.Horioka (1980) Table2

The F-H study also included the trade openness variable (as measured by the sum of exports and imports of goods and services) in the regression equation as follows:

$$(I/Y)_i = \alpha + (\beta_0 + \beta_1 X_i) (S/Y)_i \qquad\qquad (2)$$
$$(X_i : \text{total trade amount of country } i \, [\text{ percentage of GDP}])$$

The result of the above also shows that the trade openness (trade [Xi] is measured by the sum of exports and imports of goods and services) is not a major factor to explain the domestic investment, and that it is almost correlated with domestic saving rate.

The above results show that there exists strong home bias of domestic resources in investment even in those countries of OECD which are expected to be opening the capital and financial markets, and it is contrary to the hypothesis that free capital flows would result in insignificant association between the domestic savings and investment. It is now commonly called as 'F-H puzzle' in the context of international finance.

The home bias that was identified by the F-H paper (1980) is probably due to the fact that most of the advanced nations during the covered period (1960-1974) still maintained capital management and control regimes, so that domestic investment was mostly financed by domestic resources (savings), which shows high correlation between the domestic savings and investment in 21 OECD countries. However, the close correlation between savings and investment has become changed in the past decades, along with the capital account liberalization. Particularly, this trend is more applicable to smaller countries among the OECD members. In the case of emerging economies, dependency of domestic investment resources on domestic savings had kept until 1980s, but it has become changed since the 1990s, when capital and financial account liberalization was universally undertaken in many emerging countries.

Therefore, the next section will examine the changes the relationship between domestic savings and investment in the process of capital account liberalization in the past decades.

1.2 'Feldstein-Horioka Puzzle' and Relevant studies

Several studies have confirmed integration of global financial markets, and many studies have undertaken on the 'F-H puzzle' and several papers have already pointed out the 'puzzle' has been solved.

Singh (2016) surveyed the literature on saving–investment (SI) correlations and international mobility of capital (IMC) generated over more than three decades since the 1980s. He pointed out that several studies have shown the presence of high SI correlations for the developed countries with higher IMC, and low SI correlations for the developing countries.

The analysis by Giannone & Lenza (2008) has shown the fact that correlation between the domestic savings and investment has become insignificant for 23 OECD countries between 1970 and 2004.[2] Likewise, Ohta (2008) maintained that the FH puzzle is not applicable any more in the sense that correlation between saving and investment has become insignificant in the past decades between 1975 and 2005 in both advanced (21 OECD countries) and selected emerging economies.

Kumar & Rao (2011) also show that the coefficient of correlation on domestic savings and investment among 13 OECD countries during 1960-2007 steadily declined, while they claim that too much focus on the domestic saving and investment may not appropriate in understanding the current globalization Likewise, There is some argument that robustness could not be maintained if regression exercises were based on the pooled panel data.[3]

On the other hand, Wahid et al. (2011) pointed out that the association between domestic savings and investment is still high based on the analysis covering both advanced

---

[2] The analysis by Ginnone and Lenza (2008) made their conclusion, taking account of the effects of external shocks including the global financial crises.

[3] Kitamura and Fujiki (1995) suggested that robustness may be affected by the pooled data, without considering specific conditions of each country.

and emerging/developing countries. However, the countries selected (21 countries) include those countries with lower capital account openness.[4] Some research results of Ventura（2003）and Obstfeld & Rogoff（2000）tried to explain the F-H hypothesis by frictions in the global financial market.

Some comprehensive study by N. Bibi and A. Jalil (2016) covering 88 countries including both advanced and developing economies also confirmed the FH puzzle that shows a lack of international mobility among large group of countries. However, the study includes those countries which are not so much integrated in the global market especially developing countries, so that the result may not confirm the FH puzzle in true sense.

The study by Misztal (2011) utilized the VAR model in the analysis of domestic savings and investment nexus and concluded that emerging and developing countries have relatively higher correlation between domestic savings and investment, as compared with that of advanced economies industrial countries.[5]

The study on F-H puzzle by Chang et al. (2014) also confirms two puzzles, namely the commonly understood one of positive saving-investment correlations in advanced and emerging economies (the 'FH1 puzzle') and significantly higher saving-investment correlations in advanced economies than in emerging economies (the 'FH2 puzzle'). They showed that there should be some features of the model including long-run risk, and endogenous world interest rate, and cross-correlations of national and global shocks.

In the analysis on BRICS countries, T.J. Mosikari et al. (2017) has tested the validity of F-H puzzle and show that investment and savings are cointegrated during the period 2001-2014. Thus, even in emerging economies F-H puzzle has generally been proved in several research papers.

It is important to study more recent years since several important changes in the global economy and financial markets have been emerged in recent years. In this respect, Ohta (2015) analysed both OECD and emerging economies but the covered period was until 2013. Therefore, it is still necessary to analyse the latest situation in emerging economies until today. In this respect, we may have to consider the capital management and prudential controls after the Global Financial Crisis in 2008, which might have resulted in significant changes in the capital flows and economy policies in several countries in both advance and emerging economies.

This paper shows that the above-mentioned 'FH puzzles' in emerging economies also confirmed in the recent period by extending the covered period from 1980 to 2017. It should be noted that a variable of capital inflows (net) is included in the regression equations to test the effects on the overall savings and investment, as well as the effect on GDP growth. In this study not only a larger group of emerging countries are taken up, but also major 7 emerging countries are analysed separately.

One of the major implications of the analysis would be the fact that domestic savings are still important for domestic investment, as a factor for stable economic growth in emerging countries where capital flows have significantly influenced on the economies.

2. Capital Flows and Domestic Savings and Investment

2.1 The effects of capital flows on domestic savings and investment on economic growth

---

[4] The countries covered in the analysis by Wahid et al.（2011）include Bangladesh, Indonesia, Kenya, Lesotho, Niger, Togo, Zambia, Bolivia, China, Colombia, Dominican Republic, Egypt, Peru, South Africa, Sri Lanka, Swaziland, Turkey, Hungary, Oman, and Uruguay.

[5] Misztal（2011）insisted that the varied result in terms of correlation between domestic saving and investment could be explained by the differences in economic policies which usually reflect the fiscal balance and current account in each country.

One of the important aspects of increase in national saving rate for domestic investment and less dependent on external financial resources is that it may facilitate stable economic growth in a country. Dependency on external financial resources could increase vulnerability of domestic economies in those small open economies, which are easily affected by the global economic and market conditions. In this respect, capital flows in the global market should be focused in the analyses of the effects of investment and savings on economic growth in general[6] Rajan et al.（2006）has already pointed out the fact that capital inflows in developing and emerging economies has not always contributed to increase GDP growth, and that those countries which are not dependent on external capital are likely to have higher growth.

This paper not only analyses recent trends of investment-saving nexus, but also focus on the overall effects of domestic savings / investment and capital inflows (net) on GDP growth in advanced and emerging economies during the period 1980-2013 in the following sections[7].
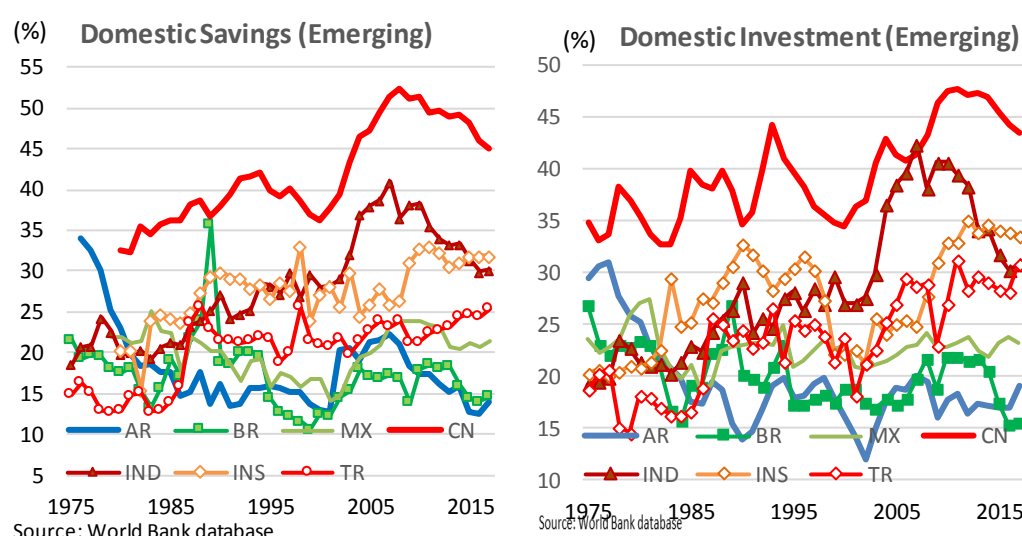
Fig.1 Emerging Economies 7: Domestic Investment & Savings

2.2 Capital Account Liberalization and Domestic Savings/Investment

The analysis by F-H (1980) was focused on the relationship between domestic investment and domestic savings as well as trade in OECD countries. In the FH analysis, only trade variable (sum of exports and imports as percentage of GDP) was used to measure openness of the economies as explanatory variable in the equations. However, capital and financial account is to be considered if the effects of openness of the economy should be considered in the nexus of domestic investment and savings, since domestic saving rates are not necessarily high if external financial resource are mobilised under the massive capital flows between the regions and economies in the past decades.

Therefore, capital flows (net inflows) should be considered as important variables in the analysis of domestic savings and investment since domestic financial resources in emerging market economies could be easily substituted to capital and financial resources in the global market.

---

[6] Khalkhali et al. (2003) found that crowding out in the domestic financial sector has been relieved gradually with capital account liberalization in the selected 19 OECD countries during the period of 1971 and 1999.

[7] The capital and financial account figures are net inflows of all financial flows including FDI, portfolio investment and other investment (short-term loans, etc.).

2.3 Capital Account Openness (KAOPEN） in regional basis

Before analytical work in the regression exercises in saving and investment correlation, some survey on the general feature of the changes in the capital account openness in major emerging and some advanced countries is conducted. The indicators to show the capital account openness should be available for everyone easily, so that the Chinn-Ito Index is adopted to show the changes of capital account openness in Emerging countries[8].

Most of the countries had not liberalized capital account transactions in both OECD and emerging economies before 1970s[9]. As shown in Fig.2, it was only early 1990s that many Asian emerging economies liberalized capital account, though several countries had already open the financial account in Latin America before 1980s. This fact shows that the assumption of F-H was not met in most of the emerging countries during which the analysis by F-H covered between 1960 and 1974.

It is to be noted that several countries including advanced and emerging economies have introduced some capital management and controls after the Global Financial Crisis (2008), which may not always reflect in the KAOPEN index (Fig.1). As we have already confirmed in the F-H study (1980), trade openness (sum of exports and imports, percentage of GDP) is not generally statistically significant variable in the equations. Therefore, it would be important to include net capital inflows in the regression equations in the analysis on saving and investment correlations as shown in the following sections.
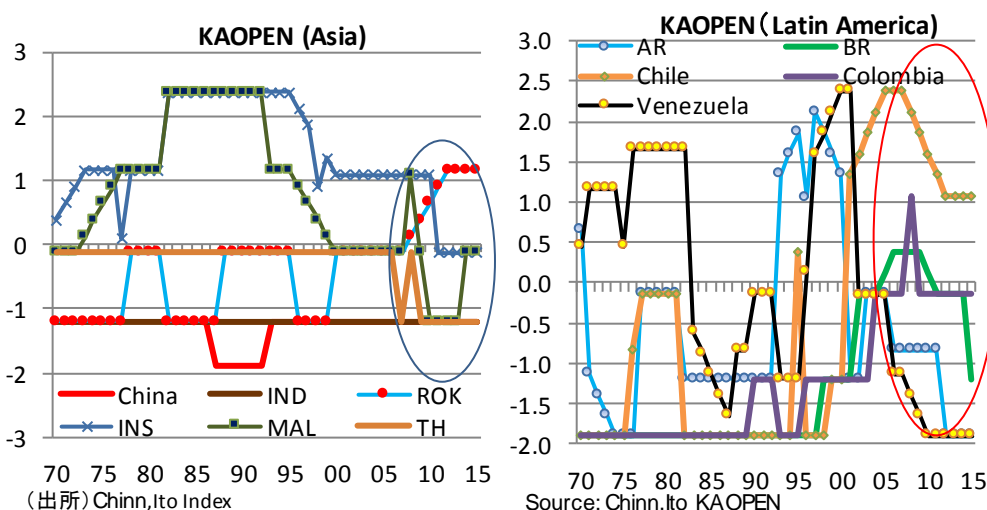
Fig.2 Capital Account Openness （KAOPEN）

3. The Effects of Capital Account Openness on the Domestic Investment/Savings and GDP Growth Savings

As already mentioned above, the 'F-H puzzle' may not be exactly 'puzzle', since the period (1970-1974) covered by the F-H analysis is during the period when capital account liberalization had not been fully undertaken even in major advanced economies. Therefore,

---

[8] The latest figures are available from the site (http://web.pdx.edu/~ito/Chinn-Ito_website.htm).The data for 1970-2016 are available for all the major countries of both advanced and emerging/developing economies.
[9] Latin American is the only region that liberalized financial account, especially short-term investment of bank loans during 1970s. This has resulted in the heavy external borrowings in late 1970s, which lead to external debt crises in Latin America in the 1980s.

we should examine the effects of capital account liberalization on domestic investment as well as growth in the emerging economies in the past decades.

In this section, analysis on the of domestic investment on domestic savings and trade as well as net capital flows is undertaken based on the data of selected 25 emerging market economies[10] during the period of 1980 and 2017.The reason why we take up the period from 1980 is that most of the emerging countries had not liberalized capital account, so that there is no significant meaning to cover the period of 1970s.

3.1 Models of the Analyses

3.1.1 Domestic Savings/ Capital Inflows and Domestic Investment

In addition to the Original F-H paper included the trade variable to show the 'openness,' in the equation (2) the regression equation including net capital/financial account equation (3) are as follows:

$$(I/Y)_i = \alpha + （\beta_0 + \beta_1 X_i）(S/Y)_i \tag{2}$$
$$(X_i : \text{total trade amount of country } i \text{ [percentage of GDP])}$$

$$(I/Y)_i = \alpha + （\beta_0 + \beta_2 CapFin_i）(S/Y)_i \tag{3}$$
$$(CapFin_i: \text{Capital/Financial net inflows (\% of GDP) of Country i]}$$

$$(I/Y)_i = \alpha + \beta S*X_i \tag{4-1}$$
$$(I/Y)_i = \alpha + \beta S*[CapFin]_i \tag{4-2}$$

$y_i :$ GDP growth rate (average of the period)
(S/Y) i: domestic saving rate as percentage of GDP
$S*X_i :$ (S/Y) i $\times$ (total trade amount of country i [percentage of GDP])
$S*[CapFin]_i :$ (S/Y) i $\times$ (total capital inflows of country i [percentage of GDP])

In this paper, the variables for each country are average figures for each period (e.g. the domestic savings rate of one country for each year from 2000 to 2004 is the average of 5 years), and the panel date for each period is used for regression analyses. Please note that the analyses used for G7 countries use dynamic panel data with fixed effects for each period.

3.1.2 Domestic Savings/ Capital Inflows / Domestic Investment & GDP growth
In this paper the effects of capital inflows are measured by the regressions with similar regression models (2), (3), (4). In the analysis, the dependent variable is GDP growth rate for each period, and other explanatory variables are as follows:

$$y_i = \alpha + \beta(S/Y)_i \tag{5-1}$$
$$y_i = \alpha + \beta S*X_i \tag{5-2}$$
$$y_i = \alpha + \beta S*[CapFin]_i \tag{5-3}$$

$y_i :$ GDP growth rate (average of the period)
(S/Y) i: domestic saving rate as percentage of GDP
$S*X_i :$ (S/Y) i $\times$ (total trade amount of country i [percentage of GDP])

---

[10] 25 countries include: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Peru, Venezuela, China, India, Indonesia, Korea, Malaysia, Philippines, Pakistan, Thailand, Singapore, Turkey, Egypt, Israel, Tunisia, Morocco, Nigeria, South Africa. Although Korea and Singapore are no more emerging countries, they are typical successful emerging economies in the past decades.

$$\text{S*[CapFin]}_i : \text{(S/Y) i} \times \text{(total capital inflows of country } i \text{ [percentage of GDP])}$$

$$y_i = \alpha + (\beta_0 + \beta_1 X_i) \text{ (S/Y) }_i \qquad\qquad (6)$$

y_i : GDP growth rate (average of the period)
X_i : total trade amount of country i [percentage of GDP])

$$y_{i\,i} = \alpha + (\beta_0 + \beta_2 CapFin_i) \text{ (S/Y) }_i \qquad\qquad (7)$$

y_i : GDP growth rate (average of the period)
$CapFin_i$: Capital/Financial net inflows (% of GDP) of Country i]

3.2 Analysis of Investment and Saving and Capital Account Openness in Emerging Countries during 1980 and 2017

The regression exercises are undertaken to show the relationship between the domestic savings and investment, together with trade and capital flows in Table 2.

As indicated above, most of the emerging economies had kept close association between domestic investment and savings until 1990s. The coefficients of determination (R^2) of the regression equations between domestic savings and investment are high, which shows high correlation between them during 1980-1999. The correlation between domestic savings and investment in the emerging countries has become weaker during 2000s, when the coefficient was 0.3925 with R^2 of 0.2925 during 2000-04 and 0.4020 with 0.3135, respectively during 2010-14. Thus, the FH original puzzle hypothesis was slightly realized during the period of high capital mobility especially during 2000s.

However, the nexus of domestic savings and investment has been changed since 2010s, especially during 2015-17, when the correlation between domestic savings and investment became significantly positive with 0.5344 of variable of R^2 and coefficient of 0.4797. The results indicate that domestic investment has been still close association with domestic savings even under the regimes of financial and capital account liberalization in emerging economies, and the association between them has become stronger since the post-Global Financial Crisis. This might be one of the results of capital management and controls introduced in several emerging economies in the last decade. On the whole, the FH puzzle still holds in emerging economies.

On the other hand, trade (sum of export and import as percentage of GDP) has no significant association with domestic investment since 2000 (see equation (4)), while the correlation between trade and domestic investment was significantly positive during 1980s and 1990s. This trend is also shared by the correlation between the explanatory variables of [Trade*Savings] and domestic investment (see (5) and (6)).

In the multiple regression equation (2) with both explanatory variables of [Trade*Savings] and domestic savings the former variable shows slightly negative correlation with domestic investment though the domestic savings have positive correlation with domestic investment. The results of same equations (2) during 2010s show insignificant result for [trade*s] variable. These results could explain the trade itself has not been an important factor for domestic investment, and the explanatory variable of domestic savings has played much important roles in domestic investment in emerging economies.

It should be also noted that the coefficient of determination (R^2) in regression equations including **capital flows** indicates relatively high correlation between savings and investment during the 1980-1994, when several emerging countries had not yet liberalized capital account. On the other hand, the insignificant regression variables of capital flows since late 1990s may reflect the fact that capital inflows had not associated with domestic investment, and this may suggest that fact that domestic investment was not related to capital inflows in

many emerging economies. As shown in equations (6) and (7), capital (net) inflows (Capflow, Capflow*S) had relatively high correlation with domestic investment during 1980-1994.

Table 2: Emerging Economies: Domestic Savings and Investment [1980-2017]

【Dependent Variables】Domestic Investment

【Explanatory】	(1) Savings	R²	(2) Trade*S	Savings	R²	(3) Capflow*S	Savings	R²
1980-84	0.7789 *** (0.115) (6.745)	0.6642	0.0010 *** (0.000) (2.972)	0.5686 *** (0.122) (4.650)	0.7604	0.0266 *** (0.007) (3.774)	0.5620 *** (0.108) (5.180)	0.7961
1985-89	0.7453 *** (0.101) (7.401)	0.7043	-0.0001 (0.000) (-0.297)	0.7687 *** (0.130) (5.929)	0.7054	0.0154 * (0.008) (1.854)	0.6757 *** (0.103) (6.570)	0.7442
1990-94	0.7685 *** (0.094) (8.196)	0.7449	-0.0007 * (0.000) (-1.944)	0.9210 *** (0.118) (7.784)	0.7823	0.0270 *** (0.006) (4.657)	0.6702 *** (0.071) (9.409)	0.8716
1995-99	0.6228 *** (0.062) (10.01)	0.8134	-0.0007 *** (0.000) (-3.073)	0.8085 *** (0.081) (10.04)	0.8695	0.0161 *** (0.004) (4.065)	0.7371 *** (0.056) (13.24)	0.8935
2000-04	0.3925 *** (0.127) (3.084)	0.2925	-0.0010 ** (0.000) (-2.305)	0.6072 *** (0.149) (4.065)	0.4301	0.0218 ** (0.009) (2.357)	0.4553 *** (0.119) (3.816)	0.4351
2005-09	0.4020 *** (0.124) (3.240)	0.3133	-0.0007 * (0.000) (-1.855)	0.5692 *** (0.148) (3.834)	0.4062	0.0207 *** (0.007) (2.970)	0.5402 *** (0.117) (4.623)	0.5099
2010-14	0.4693 *** (0.114) (4.131)	0.4260	-0.0006 (0.000) (-1.401)	0.5918 *** (0.142) (4.181)	0.4730	0.0183 ** (0.008) (2.230)	0.5818 *** (0.116) (4.998)	0.5318
2015-17	0.4797 *** (0.095) (5.03)	0.5344	-0.0008 (0.000) (-1.807)	0.6050 (0.114) (5.29)	0.5971	0.0152 ** (0.007) (2.274)	0.6298 *** (0.110) (5.75)	0.6264

【Explanatory】	(4) Trade	R²	(5) Trade*S	R²	(6) Capflow	R²	(7) Capflow*S	R²	(8) FDI	R²
1980-84	0.0734 *** (0.016) (4.543)	0.4730	0.0020 *** (0.000) (5.041)	0.5249	1.0232 *** (0.295) (3.471)	0.3437	0.0459 *** (0.009) (5.275)	0.5474	2.2885 *** (0.532) (4.300)	0.4456
1985-89	0.0415 * (0.020) (2.081)	0.1584	0.0012 ** (0.000) (2.657)	0.2348	0.7435 *** (0.284) (2.618)	0.2296	0.0353 *** (0.013) (2.713)	0.2425	0.9344 (0.598) (1.562)	0.0959
1990-94	0.0499 * (0.025) (2.021)	0.1507	0.0011 * (0.001) (2.268)	0.1828	0.8031 ** (0.329) (2.441)	0.2058	0.0432 *** (0.012) (3.556)	0.3547	1.0514 (0.683) (1.538)	0.0933
1995-99	0.0470 ** (0.019) (2.485)	0.2117	0.0010 *** (0.000) (2.923)	0.2709	-0.3575 (0.379) (-0.942)	0.0372	-0.0104 (0.010) (-1.035)	0.0445	0.7303 (0.515) (1.418)	0.0804
2000-04	-0.0033 (0.019) -(0.175)	0.0013	0.0001 (0.000) (0.225)	0.0022	0.4548 (0.296) (1.538)	0.0932	0.0139 (0.011) (1.224)	0.0612	-0.0792 (0.440) (-0.18)	0.0014
2005-09	0.0023 (0.019) (0.120)	0.0006	0.0002 (0.000) (0.470)	0.0095	0.2015 (0.308) (0.655)	0.0183	0.0079 (0.009) (0.897)	0.0338	-0.2008 (0.447) (-0.45)	0.0087
2010-14	0.0178 (0.022) (0.814)	0.0280	0.0005 (0.000) (1.149)	0.0543	-0.0863 (0.372) (-0.232)	0.0023	0.0005 (0.011) (0.048)	0.0001	0.2089 (0.368) (0.568)	0.0138
2015-17	0.0192 (0.024) (0.793)	0.0278	0.0006 (0.001) (1.182)	0.0597	-0.4274 (0.284) (-1.507)	0.0936	-0.0079 (0.008) (-0,001)	0.0392	0.0565 (0.349) (0.162)	0.0012

Notes: 1 Countries include Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Peru, Venezuela, China, India, Indonesia, Korea, Malaysia, Philippines, Pakistan, Thailand, Singapore, Turkey, Egypt, Israel, Morocco, Nigeria, South Africa, Tunisia China's savings rate is from 1982; Indonesia from 1981.

2 Domestic Saviings= Gross Savings; gross national income less total consumption, plus net transfers.
  Domestic Investment =Gross Capital Formation, defineds as :outlays on additions

3 Figures in parenthesis (upper): standard errors; (lower): T-values.
  *** coefficients significant at the 1% level, ** at the 5 % level, * at the 10% level.

4 Regression of Total Investment on Gross Savings and Tade.

Sources: Author's Calculation based on the World Bank /IMF(Capital flows) Database

EM：Savings/Investment

EM：Trade*S/Investment

EM Capflows/Investment

EM：FDI/Investment
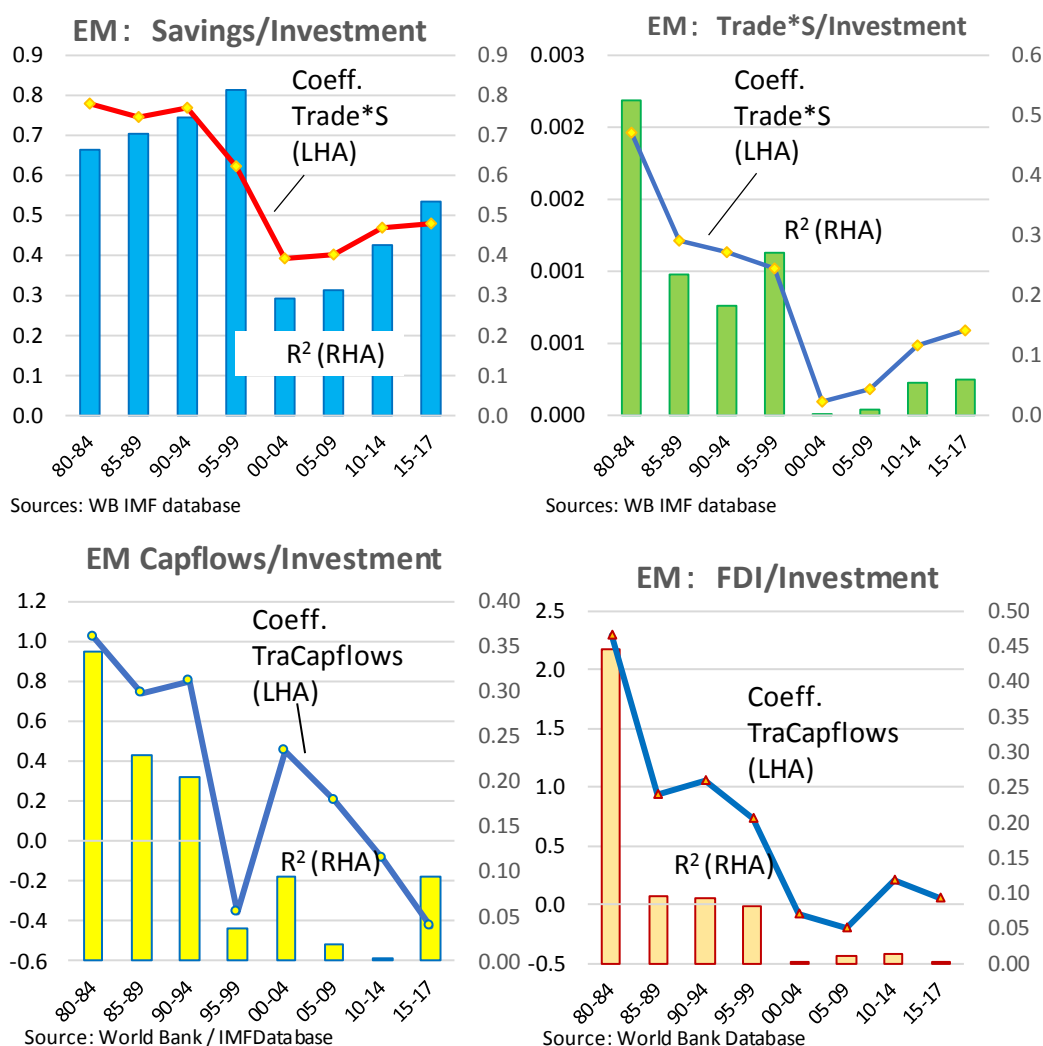
Fig.3 Emerging: Domestic Savings/ Investment/ Trade/ Capital Inflows

However, the association between capital flows and domestic investment are no more significant factor for domestic investment since late 1990s to date (from 1995 to 2017). The background might be the fact that capital investment in emerging countries has become more oriented towards non-productive financial investment, which is not contributing domestic investment in general in recent years.

The multiple regression equations (3) with both [Capflow*S] and domestic savings show that the former has been significant until 2015-17, however, the correlation (R^2) itself has declined since 2000, which is different from those periods of 1980s and 1990s. From this fact, it could be shown that capital flows have no more significant association with domestic investment now.

It is also important to note that domestic investment has no significant correlation with FDI since late 1985 to date (equations No.8, Fig.2). This may suggest that foreign investment has not promoted domestic investment in emerging economies in general. This result is different from the common understanding of contribution of FDI in economic development in developing economies. The cases of larger emerging economies will be shown later in this chapter.

It is to be noted that the fact that capital and financial liberalization has facilitated dependence of many emerging countries on the external financial resources for domestic

11

investment rather than domestic savings during the period between 1990s and 2000s. This is very indicative fact that many smaller countries among the selected emerging economies have increased external financing: the coefficients in the regression equations of saving/investment significantly decreased with the coefficient of determination (R^2) of 0.2925 with coefficient of 0.3925 during 2000-2004.

The above results generally confirm the fact that most of the emerging economies have increased capital mobility, which accelerated dependence on the external resources for domestic investment until 2000s. This is exactly the situation that was assumed in the discussion of F-H hypothesis in their paper (1980).

However, the savings/investment relationship has become clearly different after the Global Financial Crisis. In the post Global Financial Crisis since 2010, the domestic savings and investment nexus has become significant in the sense that the correlation between domestic savings and investment in 2010-2017 has become significant. The trend of 'recovery' of significance of correlation between the domestic savings and investment during 2010s until today may reflect the recent situation that global capital flows have relatively smaller in scale as compared with that before the Global Financial Crisis until 2007. This could be partly because several kinds of capital and financial controls as well as prudential controls have become common among the emerging economies in the past years.

All the above results indicate that domestic savings and investment nexus has been kept in principle and had relatively strong correlation between them during the whole period of 1980-2017. Although the association between domestic savings and investment became less significant due to liberalized capital/financial account in the 1990s and 2000s in several emerging economies, the association between domestic savings and investment has become somewhat recovered since late 2000s. This would be partly due to several capital/ financial account restrictions introduced in emerging countries, especially in Asia.

3.3 Analysis of Investment / Saving and Capital Account Openness in Major Emerging Economies (EM7) during 1975 and 2017

3.3.1 Major Emerging Economies (EM7)

Since majority of the selected emerging economies are small countries, the share of external trade and capital inflows are larger than that of large countries. The large countries among the selected emerging economies may have different from other smaller emerging countries in the nexus of domestic savings and investment. China and India, which have kept capital controls and management until today, would retain the close association between domestic savings and investment. In this sense, smaller emerging countries have been more affected by international capital flows due to the relatively open financial/ capital account[11].

As mentioned above, the results of nexus domestic savings and investment may be different from the total one in the case of major emerging countries. Correlation between domestic savings and investment as well as GDP growth are easily affected by capital flows in smaller countries. It is therefore necessary to examine the cases of larger emerging economies, namely Argentina, Brazil, Mexico, China, India, Indonesia, Turkey (as EM7), whether any substantial change has been taken place in those countries[12].

It should be noted that the figures of correlation between domestic savings/ capital inflows and investment were significant in EM7 even during the 1990s and 2000s as compared with the result of total sample of emerging economies including smaller nations,

---

[11] This paper will also discuss the major emerging countries to study whether the correlation between domestic savings and investment is different in the sense that weaker association between domestic savings and investment in smaller emerging economies.

[12] The regression analyses for EM7 are based on the dynamic panel data, due to the sample number of variables are relatively small (see Table 3).

though the trend shows weakening correlation between domestic investment and savings (Table 3). The model in the analysis uses fixed-effect panel data which include the covered period (e.g. each country's data on domestic savings [per GDP] for the period 2010-2014 is used for the panel data).

Table 3: Emerging 7 *: Domestic Savings and Investment [1975-2017]

【Dependent Variables】 Domestic Investment

【Explanatory】	(1) Savings	R^2	(2) Trade*S	R^2	(3) Capflow*S	Savings	R^2
1980-84	0.7795 *** (0.062) (12.55)	0.8268	0.0060 * (0.003) (1.983)	0.1064	0.0270 *** (0.004) (6.009)	0.7140 *** (0.046) (15.38)	0.9061
1985-89	0.9136 *** (0.053) (17.27)	0.9003	0.0109 *** (0.002) (4.780)	0.4091	0.0264 *** (0.005) (5.39)	0.8167 *** (0.043) (19.07)	0.9478
1990-94	0.8419 *** (0.045) (18.56)	0.9126	0.0122 *** (0.002) (7.633)	0.6384	0.0222 *** (0.004) (5.319)	0.7648 *** (0.037) (20.92)	0.9536
1995-99	0.6894 *** (0.038) (17.91)	0.9067	0.0068 *** (0.001) (4.553)	0.3858	0.0136 *** (0.003) (4.256)	0.6856 *** (0.031) (21.94)	0.9404
2000-04	0.7567 *** (0.059) (12.83)	0.8330	0.0095 *** (0.002) (6.013)	0.5228	0.0248 *** (0.002) (11.93)	0.6398 *** (0.027) (23.29)	0.9693
2005-09	0.7713 *** (0.046) (16.80)	0.8953	0.0103 *** (0.001) (9.774)	0.7433	0.0288 *** (0.006) (5.15)	0.6767 *** (0.039) (17.32)	0.9427
2010-14	0.8627 *** (0.036) (23.88)	0.9453	0.0137 *** (0.001) (13.137)	0.8395	0.0204 *** (0.005) (3.710)	0.8322 *** (0.032) (26.20)	0.9617
2015-17	0.8365 *** (0.040) (21.14)	0.9592	0.0170 *** (0.001) (15.250)	0.9245	0.0055 (0.006) (0.862)	0.8541 *** (0.045) (19.09)	0.9608

【Dependent Variables】 Domestic Investment

【Explanatory】	(4) Trade	R^2	(5) Capflow	R^2	(6) Capflow*S	R^2	(7) FDI	R^2
1980-84	-0.0317 (0.074) (-0.43)	0.0056	0.5812 * (0.279) (2.085)	0.1265	0.0295 ** (0.013) (2.209)	0.1399	1.5862 (2.001) (0.793)	0.0205
1985-89	0.1462 (0.074) (1.986)	0.1068	1.0863 *** (0.363) (2.989)	0.2130	0.0655 *** (0.015) (4.259)	0.3548	0.4295 (2.796) (0.15)	0.0007
1990-94	0.2686 *** (0.08) (3.19)	0.2359	0.6093 (0.405) (1.504)	0.0642	0.0568 *** (0.014) (3.930)	0.3188	3.1394 *** (0.873) (3.60)	0.2817
1995-99	0.0976 (0.062) (1.568)	0.0693	-0.7207 (0.478) (-1.507)	0.0644	0.0156 (0.013) (1.240)	0.0445	0.4880 (0.584) (0.83)	0.0207
2000-04	0.1176 (0.097) (1.208)	0.0423	0.7263 *** (0.210) (3.460)	0.2662	0.0420 (0.008) (5.192)	0.4496	0.4186 (0.765) (0.55)	0.0090
2005-09	0.3586 *** (0.119) (3.004)	0.2147	1.0838 * (0.592) (1.830)	0.0921	0.0744 (0.016) (4.749)	0.4060	3.8002 ** (1.526) (2.49)	0.1583
2010-14	0.3021 ** (0.125) (2.421)	0.1508	-0.1852 (0.756) (-0.24)	0.0018	0.0577 ** (0.025) (2.328)	0.1411	0.7923 (1.930) (0.411)	0.0051
2015-17	0.6306 *** (0.171) (3.689)	0.4173	-2.1422 *** (0.726) (-2.949)	0.3140	-2.1422 (0.726) (-0,003)	0.1682	-4.3348 ** (1.862) (-2.33)	0.2220

The domestic savings and investment have always been correlated during the whole period of 1980-2017 (equation (1)), and the similar trend is also found in the regression (3) which includes both [Capflow*s] and domestic savings.

The single regression between domestic investment and trade(No.4) shows there is no significant correlation between the variables since 1980s to early 2000s, except the period 1990-94. It was only after 2005 that the regression has become significantly correlated especially since 2015 until 2017.

On the other hand, capital flows had significant correlation with investment during 1985-1989 and 2000-04, when capital flows to emerging countries increased(equation (5)). However, capital inflows have not significantly positive correlation with domestic investment since 2005, and negatively correlated during 2015-17. These may indicate that recent capital flows have been invested in financial investment and not in real economies in emerging markets. Although domestic investment has positively correlated with [capital inflows*domestic savings] since 1980s until 2000s (No.6) except the period 1995-99, the relation between them has become negative in recent years (2015-17).

Like the result of capital flows nexus domestic investment above, FDI has become negatively correlated with domestic investment during the late period (2015-17) (No.7). It may suggest that capital inflows in the form of FDI have not been utilized for domestic investment in the real sector in several emerging economies.

The above results show that domestic savings would be by far the most important factor for domestic investment in major emerging countries.

The other important aspect on the changes in the last decade is that while domestic savings and investment nexus recovered, trade has become significantly correlated with domestic investment with coefficient of 0.6306 and R^2 of 0.4173 during 2015-17, as compared with that of 0.30 and 0.1505 during 2010-14, respectively (No.4). This could be significant increase in exports which should have positive impact upon domestic investment and production, especially China recently.

On the other hand, domestic investment nexus capital inflows have become negatively correlated during 2010-17, though it is not statistically significant. It shows the fact that capital inflows to emerging economies have not associated with domestic investment and no productive investment is associated with capital inflows.

3.3.2 Regional based Analysis on Major Emerging Economies (EM7)
In the analysis, regional dummies (Asian and Latin America) are included in the explanatory variables to show significant differences among the regions.

Among the major 7 emerging economies, there are no clear difference in the importance of domestic savings which have played significant role in domestic investment, during the whole period in major emerging economies (Table 4).

On the other hand, capital flows had significantly positive correlation with domestic investment during 1990s, but the significance has not been seen since 2010s. While FDI has positively correlated during the whole period, the significance on the regression has declined in recent years.

Among the major emerging economies, the Asian countries have practically all variables (trade, FDI, capital inflows, etc.) have positively correlated with domestic investment during the whole period between 1980 and 2017. It could be also explained by

Table 4: Emerging Economies 7: Doestic Investment and Savings/ Trade/ Capital Inflows/ FDI

【Dependent Variables】 Domestic Investment (%、GDP)

	1980-89						1990-99					
Savings	0.8507 *** (0.047) (18.24)						0.7451 *** (0.029) (25.286)					
Trade		0.0339 (0.043) (0.789)						0.0589 (0.034) (1.735)				
Capflow			0.4632 ** (0.197) (2.352)						0.4860 *** (0.182) (2.670)			
FDI				6.775 *** (1.570) (4.316)						1.350 *** (0.245) (5.501)		
Savings* Trade					0.0061 *** (0.002) (3.583)						0.0044 *** (0.001) (3.865)	
Savings* Capflow						0.0341 *** (0.010) (3.373)						0.0258 *** (0.006) (4.106)
Argentina Brazil Mexico	-0.2628 (0.748) (-0.351)	1.366 (1.941) (0.704)	1.2355 (1.733) (0.713)	-3.7588 * (1.906) (-1.972)	2.2490 (1.723) (1.306)	1.1411 (1.658) (0.688)		-2.970 ** (1.532) (-1.938)	-4.7021 *** (1.451) (-3.241)	-5.8882 *** (1.285) (-4.581)	-1.8772 (1.431) (-1.312)	-4.4529 *** (1.334) (-3.337)
Asia(China India Indonesia)	0.5202 (0.874) (0.595)	8.8963 *** (1.826) (4.871)	8.0783 *** (1.765) (4.577)	7.7677 *** (1.615) (4.810)	7.5847 *** (1.713) (4.428)	7.2758 *** (1.727) (4.213)		7.6679 *** (1.452) (5.279)	7.4319 *** (1.410) (5.270)	5.7080 *** (1.272) (4.488)	6.0576 *** (1.394) (4.345)	6.7866 *** (1.336) (5.079)
Crises (AR/BR/MX INS/TR)							-2.1006 ** (0.783) (-2.684)	-3.2223 * (1.560) (-2.065)	-0.1465 (1.716) (-0.085)	-2.4373 * (1.275) (-1.912)	-3.9834 ** (1.441) (-2.764)	0.5237 (1.563) (0.335)
Constant	4.979 *** (1.026) (4.854)	18.501 *** (2.032) 9.1066	19.068 *** (1.505) (12.668)	18.181 *** (1.403) 12.962	16.341 *** (1.701) (9.609)	18.985 (1.442) 13.166	8.096 *** (0.756) (10.711)	21.890 *** (1.813) 12.076	23.116 *** (1.287) (17.957)	23.548 *** (1.074) 21.917	20.570 *** (1.489) (13.818)	22.979 *** (1.187) 19.353
No. Obs.	70	70	70	70	70	70	70	70	70	70	70	70
R^2	0.902	0.416	0.453	0.541	0.5064	0.496	0.910	0.677	0.6953	0.769	0.725	0.732

15

【Dependent Variables】Domestic Investment (%、GDP)

	2000-2009						2010-2017					
Savings	0.7758 *** (0.036) (21.67)						0.7578 (0.034) (22.12)					
Trade		0.0486 (0.058) (0.833)						0.0851 (0.056) (1.529)				
Capflow			0.7446 *** (0.132) (5.624)						-0.2023 (0.284) (-0.713)			
FDI				2.703 *** (0.368) (7.354)						1.520 * (0.706) (2.155)		
Savings* Trade					0.0068 *** (0.001) (6.075)						0.0087 *** (0.001) (7.925)	
Savings* Capflow						0.0401 *** (0.005) (8.648)						-0.0026 (0.009) (-0.303)
Argentina Brazil Mexico		-5.331 ** (2.120) (-2.515)	-3.499 * (1.751) (-1.999)	-8.298 *** (1.576) (-5.264)	-3.6079 * (1.697) (-2.126)	-2.754 * (1.459) (-1.888)	-4.6885 *** (0.615) (-7.622)	-7.716 *** (2.043) (-3.777)	-9.5864 *** (1.999) (-4.796)	-10.860 *** (1.980) (-5.486)	-4.3340 *** (1.399) (-3.098)	-9.2743 *** (1.982) (-4.680)
Asia(China India Indonesia)		8.5926 *** (2.080) (4.130)	10.0779 *** (1.725) (5.843)	7.9700 *** (1.543) (5.167)	3.4530 *** (1.878) (1.839)	9.0462 *** (1.421) (6.366)	-1.5624 (0.761) (-0,002)	9.6396 *** (1.854) (5.200)	8.5790 *** (2.100) (4.084)	8.3363 *** (1.850) (4.506)	4.4838 *** (1.400) (3.202)	9.1230 *** (1.932) (4.721)
Global/ AR/TR Crises	0.3551 (0.824) (0.43)	1.3272 (1.520) (0.87)	2.5321 * (1.271) (1.992)	0.7066 (1.132) (0.624)	0.8453 (1.223) (0.691)	2.5830 ** (1.052) (2.455)						
Constant	5.659 *** (1.055) (5.365)	22.135 *** (3.303) (6.701)	21.620 *** (1.602) (13.50)	20.123 *** (1.491) (13.50)	17.480 *** (1.871) (9.340)	21.007 (1.326) (15.84)	11.210 *** (0.953) (11.761)	24.817 *** (3.223) (7.701)	30.234 *** (2.268) (13.33)	26.735 *** (1.906) (14.03)	18.728 *** (1.706) (10.976)	29.442 *** (1.978) (14.88)
No. Obs.	70	70	70	70	70	70	56	56	56	56	56	56
R^2	0.876	0.599	0.727	0.779	0.741	0.811	0.979	0.795	0.788	0.803	0.903	0.786

Notes: 1 Countries include Argentina, Brazil, China, India, Indonesia,Mexico, Turkey. 'Asia' includes China, India and Indonesia

2 Domestic Saviings= Gross Savings; gross national income less total consumption, plus net transfers.

Domestic Investment =Gross Capital Formation, defineds as :outlays on additions

3 Figures in parenthesis (upper): standard errors; (lower): T-values.   *** coefficients significant at the 1% level, ** at the 5 % level, * at the 10% level.

the fact that in China and India major investment activities are very much depend on domestic resources mainly, not by the FDI in general. However, the correlation between the same variables have generally negative in Latin American countries. The regression including dummy variable for Latin America indicates This has very different feature between the regions of Asia and Latin America.

The results of regression analyses on 7 major emerging economies show that capital inflows generally put positive relation with GDP growth during 1980-2000s which is different from the whole emerging economies (see Table 5). FDI has had relatively positive correlation with GDP growth during 1990s and 2000s in 7 major countries, while the total emerging countries has no positive association with GDP growth.

Despite of such differences between major countries and smaller countries, domestic savings have kept positive correlation with GDP growth during the whole period (1980-2017) in emerging economies, which would indicate the importance of domestic savings for sustainable development.

4. Analysis of GDP Growth and Saving / Capital Account Openness in Emerging Economies during 1975 and 2017

4.1 GDP Growth and Saving / Capital Account Openness in EM

Table 5 shows that GDP growth has correlated with domestic savings during the whole period except early 2000 (2000-04). The capital account was not liberalized in most of developing/ emerging countries before the1980s, and gradual liberalization began during 1990s. As a result, there was still a certain significantly positive correlation between domestic saving and GDP growth until in late 1980s and early1990s (1985-1994) (Table5).

However, the correlation has become insignificant since late 1990s. The coefficient of 0.231 with R^2 of 0.5633 in 1990-94 dropped to 0.0957 and 0.1967 in 1995-99 and 0.594 and 0.0593 respectively in 2000-04 (equation No.1). This could be explained by the fact that domestic savings have not been effectively utilized for domestic investment in the real economy but mobilized for other non-productive sectors of economies (e.g. financial sectors and real estates) in both domestic and foreign markets. After the global Financial Crisis, however, the domestic savings and GDP growth nexus has correlated, and the coefficient 0.1025 with R^2 0.318 in 2010-2014 and 0.1166 with 0.3069 respectively in 2015-17.

The fundamental background is that during the post-Lehman Shock, financial investment has been concentrated I advanced economies rather than emerging markets, so that the capital inflows have not played significant roles in GDP growth in emerging economies in general. It is also related to the fact that capital management and controls have been introduced in several major countries in Asia and Latin America.

The equations (5) and (6) including trade & [Trade*S] show that only limited period during 1985-1994 correlation between trade and GDP growth was significantly observed, but the significance has practically disappeared since 1995 until today. It should be also noted that although capital inflows had positive relation with the GDP growth during 1980s, it has become insignificant since 1990s when capital account liberalization became universally conducted in many emerging economies (see equation (7) and (8)).

The coefficient of 0.3871 with R^2 of 0.2763 during 1985-89 fell to 0.1768 and 0.0836, respectively during 1990-94 (equation (7)). The similar trend is also seen in the case of the equation (8) which uses variable of [Capflow*s]. The equation (4) with variable of [Capflow*S] and domestic savings also show the fact that capital inflows ([Capflow*S]) does not show any significance as an explanatory variable in the regressions. This fact could be accounted for by the fact that investment has become concentrated in financial sectors ('speculative') and other non-productive sectors of the economies globally.

Table 5: Emerging Economies: Domestic Savings and GDP Growth [1980-2017]

【Dependent Variables】GDP Growth

【Explanatory】	(1) Savings	R²	(2) Investment	R²	(3) Trade*S	Savings	R²	(4) Capflow*S	Savings	R²
1980-84	0.2383 *** (0.081) (2.927)	0.2714	0.2243 *** (0.088) (2.544)	0.2195	0.0000 (0.000) (-0.16)	0.2477 ** (0.102) (2.428)	0.2722	0.0098 (0.006) (1.624)	0.1585 (0.093) (1.708)	0.3494
1985-89	0.2895 *** (0.064) (4.533)	0.4719	0.3024 ** (0.076) (3.965)	0.4060	0.0000 (0.000) (-0.191)	0.2991 *** (0.082) (3.633)	0.4728	0.0107 * (0.005) (2.063)	0.2412 *** (0.064) (3.757)	0.5575
1990-94	0.2310 *** (0.042) (5.447)	0.5633	0.2747 *** (0.044) (6.280)	0.6316	-0.0001 (0.000) (-0.299)	0.2241 *** (0.069) (3.230)	0.4284	0.0059 (0.003) (1.689)	0.2096 *** (0.043) (4.907)	0.6134
1995-99	0.0957 ** (0.040) (2.373)	0.1967	0.1421 ** (0.058) (2.450)	0.2070	-0.0002 (0.000) (-1.284)	0.1536 ** (0.060) (2.554)	0.2527	0.0038 (0.003) (1.151)	0.1226 *** (0.046) (2.64)	0.2423
2000-04	0.0594 (0.049) (1.205)	0.0593	0.0888 (0.068) (1.315)	0.0699	0.0000 (0.000) (0.003)	0.0593 (0.064) (0.919)	0.0593	0.0013 (0.004) (0.323)	0.0631 (0.052) (1.223)	0.0638
2005-09	0.1034 *** (0.036) (2.845)	0.2603	0.1728 *** (0.051) (3.406)	0.3353	-0.0002 * (0.000) (-1.840)	0.1494 *** (0.043) (3.500)	0.3589	0.0038 (0.002) (1.744)	0.1323 *** (0.039) (3.429)	0.3501
2010-14	0.1025 *** (0.031) (3.275)	0.3180	0.1155 * (0.047) (2.464)	0.2088	0.0000 (0.000) (-0.000)	0.1097 *** (0.041) (2.699)	0.3205	0.0020 (0.002) (0.825)	0.1150 *** (0.035) (3.288)	0.3385
2015-17	0.1166 *** (0.037) (3.121)	0.3069	0.1675 *** (0.058) (2.872)	0.2726	-0.0003 * (0.000) (-1.824)	0.1660 *** (0.045) (3.715)	0.4016	0.0068 (0.003) (2.718)	0.1841 *** (0.041) (4.467)	0.4872

【Dependent Variables】GDP Growth

【Explanatory】	(5) Trade	R²	(6) Trade*S	R²	(7) Capflow	R²	(8) Capflow*S	R²	(9) FDI	R²
1980-84	0.0115 (0.010) (1.104)	0.0504	0.0004 (0.000) (1.387)	0.0772	0.4224 *** (0.150) (2.810)	0.2556	0.0152 *** (0.005) (2.865)	0.2630	0.4994 (0.326) (1.532)	0.0926
1985-89	0.0182 * (0.010) (1.903)	0.1360	0.0005 * (0.000) (2.065)	0.1564	0.3871 *** (0.131) (2.964)	0.2763	0.0178 *** (0.006) (2.944)	0.2737	0.4048 (0.286) (1.414)	0.0800
1990-94	0.0184 * (0.008) (2.184)	0.1718	0.0004 * (0.000) (2.401)	0.2004	0.1768 * (0.122) (1.448)	0.0835	0.0109 ** (0.005) (2.325)	0.1903	0.5403 ** (0.234) (2.308)	0.1881
1995-99	0.0037 (0.007) (0.553)	0.0131	0.0001 (0.000) (0.860)	0.0311	-0.0409 (0.120) (-0.000)	0.0050	-0.0006 (0.003) (-0.000)	0.0016	0.0497 (0.167) (0.297)	0.0038
2000-04	0.0049 (0.006) (0.792)	0.0266	0.0001 (0.000) (0.739)	0.0232	-0.0873 (0.103) (-0.001)	0.0305	0.0002 (0.004) (0.051)	0.0001	0.0761 (0.147) (0.517)	0.0115
2005-09	-0.0018 (0.006) (-0.33)	0.0047	0.0002 * (0.000) (2.156)	0.1965	-0.0135 (0.079) (-0.000)	0.0013	0.0000 (0.000) (0.213)	0.0020	0.0222 (0.124) (0.179)	0.0014
2010-14	0.0058 (0.005) (1.066)	0.0471	0.0002 (0.000) (1.559)	0.0955	-0.0557 (0.093) (-0.001)	0.0152	-0.0015 (0.003) (-0.001)	0.0134	0.1210 (0.090) (1.344)	0.0728
2015-17	0.0010 (0.008) (0.130)	0.0008	0.0001 (0.000) (0.429)	0.0083	-0.0275 (0.095) (-0.289)	0.0038	0.0001 (0.003) (0.026)	0.0000	-0.0451 (0.112) (-0.403)	0.0073

Notes: 1 Countries include Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Peru, Venezuela, China, India, Indonesia, Korea, Malaysia, Philippines, Pakistan, Thailand, Singapore, Turkey, Egypt, Israel, Morocco, Nigeria, South Africa, Tunisia China's savings rate is from 1982; Indonesia from 1981.
2 Domestic Investment =Gross Capital Formation, defineds as :outlays on additions
3 Figures in parenthesis (upper): standard errors; (lower): T-values.
  *** coefficients significant at the 1% level, ** at the 5 % level, * at the 10% level.
4. Regression of GDP growth on Gross Savings and Tade./ Capital inflows
Sources: Author's Calculation based on the World Bank /IMF(Capital flows) Database
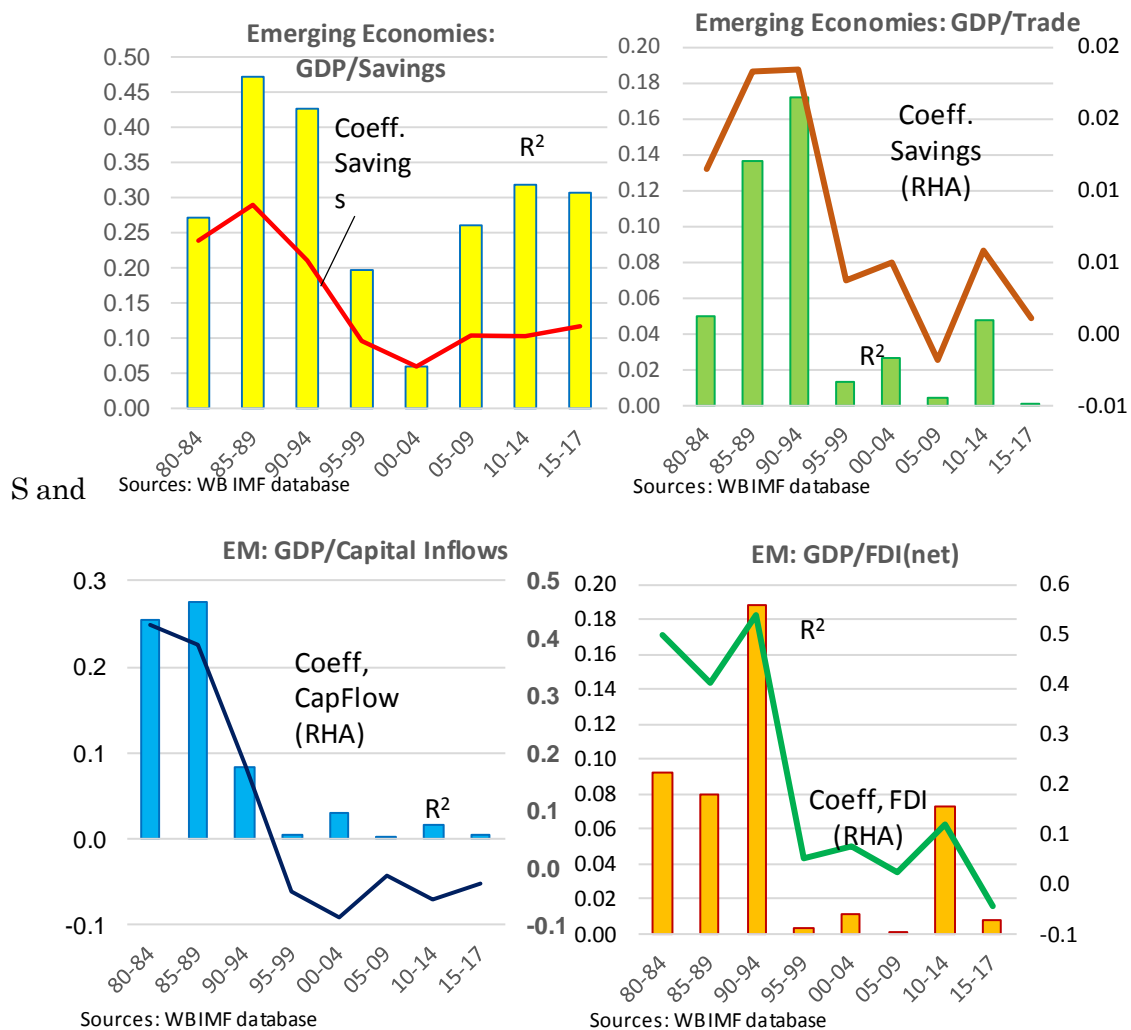
Fig.4 Emerging Economies: GDP Growth & Domestic Savings/ Trade/ Capital Inflows/FDI

Thus, the overall result of the above in emerging economies would show that the nexus domestic savings and GDP growth in general had kept significant correlation, except the period of 2000-04, while correlation between capital inflows and GDP growth became weaker since 1995 to date.

4.2 GDP Growth and Saving and Capital Account Openness in Major Emerging Economies (EM7) during 1980 and 2017

Since small economies are included among the 25 Emerging countries, it may be useful to focus on the relationship between domestic savings and GDP growth in major emerging economies (EM7). To show detailed relationship between domestic investment, savings, capital inflows and GDP growth in G7 countries, each variable of savings, trade (net), capital inflows (net) and FDI are put as explanatory variables. Table 6 shows results on the regression of GDP growth against several variables, including domestic savings, trade, capital inflows and dummy variables of major Asian and Latin American emerging countries, as well as to show the differences in the savings, trade, capital inflows among the countries.

Table 6: Emerging Economies 7: GDP growth and Doestic Savings/ Trade/ Capital Inflows/ FDI

【Dependent Variables】 GDP Growth — 1980-89

	(1)	(2)	(3)	(4)	(5)	(6)
Savings	0.2459 ***					
	(0.100)					
	(2.452)					
Trade		0.0309				
		(0.037)				
		(0.829)				
Capflow			0.4813 **			
			(0.175)			
			(2.756)			
FDI				-1.748		
				(1.593)		
				(-1.097)		
Savings*Trade					0.0023	
					(0.002)	
					(1.430)	
Savings*Capflow						0.0265 ***
						(0.009)
						(2.843)
Argentina	1.2507	-3.092 *	-3.1600 *	-2.3809	-3.0443 *	-3.3366 *
Brazil	(1.427)	(1.682)	(1.536)	(1.935)	(1.608)	(1.526)
Mexico	(0.877)	(-1.838)	(-2.057)	(-1.231)	(-1.894)	(-2.186)
Asia(China	-0.0741	3.0250 *	2.3112	3.1322 *	2.5017	1.8388
India	(1.667)	(1.583)	(1.565)	(1.639)	(1.599)	(1.590)
Indonesia)	(-0.000)	(1.911)	(1.477)	(1.911)	(1.565)	(1.157)
Crises	-8.5210 ***					
	(1.371)					
	(-6.213)					
Constant	-0.4791	3.1831	3.6418 ***	4.4433 ***	2.9201 *	3.6934
	(2.455)	(1.761)	(1.335)	(1.423)	(1.587)	(1.328)
	(-0.000)	(1.808)	(2.728)	(3.122)	(1.840)	(2.782)
No. Obs.	70	70	70	70	70	70
R^2	0.478	0.346	0.398	0.338	0.3589	0.402

【Dependent Variables】 GDP Growth — 1990-99

	(1)	(2)	(3)	(4)	(5)	(6)
Savings	0.2459 **					
	(0.100)					
	(2.452)					
Trade		-0.0772 *				
		(0.037)				
		(-2.063)				
Capflow			0.9639 ***			
			(0.146)			
			(6.584)			
FDI				0.676 *		
				(0.332)		
				(2.039)		
Savings*Trade					-0.0023	
					(0.001)	
					(-1.693)	
Savings*Capflow						0.0390 ***
						(0.005)
						(7.390)
Argentina	1.2507	-1.688	2.2929 *	-1.6873	-1.6176	-1.3154
Brazil	(1.427)	(1.730)	(1.328)	1.7327	(1.767)	(1.266)
Mexico	(0.877)	(-0.976)	(1.726)	(-0.97)	(-0.915)	(-1.039)
Asia(China	-0.0741	2.5501	2.2929 *	1.7831	3.4859 *	1.3836
India	(1.667)	(1.657)	(1.328)	(1.718)	(1.733)	(1.276)
Indonesia)	(-0.000)	(1.539)	(1.726)	(1.038)	(2.012)	(1.084)
Crises	-5.3517 ***					
	(0.784)					
	(-6.827)					
Constant	-0.4791	7.0209 ***	2.4123 *	3.6827 **	5.9401 ***	2.6790 **
	(2.455)	(2.058)	(1.173)	(1.441)	(1.855)	(1.108)
	(-0.000)	(3.412)	(2.056)	(2.555)	(3.202)	(2.418)
No. Obs.	70	70	70	70	70	70
R^2	0.478	0.164	0.463	0.163	0.147	0.513

	【Dependent Variables】GDP Growth 2000-2009						【Dependent Variables】GDP Growth 2010-2017					
Savings	0.3124 *** (0.057) (5.474)						0.1585 ** (0.058) (2.737)					
Trade		0.0115 (0.043) (0.267)						0.0466 (0.031) (1.492)				
Capflow			0.4004 *** (0.106) (3.787)						0.2010 (0.157) (1.278)			
FDI				0.911 ** (0.346) (2.632)						0.237 (0.411) (0.576)		
Savings* Trade					0.0026 *** (0.001) (2.604)						0.0022 ** (0.001) (2.249)	
Savings* Capflow						0.0184 *** (0.004) (4.204)						0.0075 (0.005) (1.565)
Argentina Brazil Mexico	0.1335 (1.089) (0.123)	-1.399 (1.560) (-0.897)	-0.255 (1.418) (-0.180)	3.2448 ** (1.452) (2.235)	-0.7137 (1.481) (-0.482)	-0.090 (1.393) (-0.065)	-3.650 *** (1.040) (-3.510)	-3.821 *** (1.146) (-3.334)	-4.0674 *** (1.108) (-3.670)	-4.8465 *** (1.154) (-4.198)	-3.3321 *** (1.094) (-3.046)	-4.0229 *** (1.086) (-3.703)
Asia(China India Indonesia)	-1.3465 (1.327) (-0,001)	3.449 ** (1.528) (2.257)	4.1364 *** (1.391) (2.973)	3.2448 ** (1.452) (2.235)	1.5241 (1.634) (0.932)	3.5654 ** (1.353) (2.636)	-2.2070 (1.286) (-0,002)	0.2640 (1.040) (0.254)	0.7369 (1.165) (0.633)	-0.0869 (1.079) (-0,000)	-1.1879 (1.095) (-0,001)	0.4530 (1.059) (0.428)
Crises	-5.3517 *** (0.784) (-6.827)											
Constant	-1.3186 (1.560) (-0,001)	3.4273 (2.409) (1.423)	2.6572 * (1.244) (2.135)	2.4564 * (1.380) (1.781)	1.3180 (1.616) (0.816)	2.5720 (1.217) (2.113)	3.0995 (1.611) (1.924)	4.4957 ** (1.808) (2.486)	5.7159 *** (1.258) (4.544)	6.4735 *** (1.112) (5.824)	4.1391 *** (1.334) (3.102)	5.8742 (1.085) (5.416)
No. Obs.	70	70	70	70	70	70	56	56	56	56	56	56
R²	0.640	0.249	0.383	0.320	0.319	0.407	0.526	0.480	0.474	0.461	0.522	0.482

Notes: 1 Countries include Argentina, Brazil, China, India, Indonesia,Mexico, Turkey. 'Asia' includes China, India and Indonesia

2 Domestic Saviings= Gross Savings; gross national income less total consumption, plus net transfers.

  Domestic Investment =Gross Capital Formation, defineds as :outlays on additions

3 Figures in parenthesis (upper): standard errors; (lower): T-values.   *** coefficients significant at the 1% level, ** at the 5 % level, * at the 10% level.

4 Crises include in mexico (1994/5), Indonesia (1997/8), Argentina and Turkey (2001/2) , Global Financial Crisis (2008/9)

Sources: Author's Calculation based on the World Bank /IMF(Capital flows) Database

In general, domestic savings have basically correlation with GDP growth in EM7 economies during the whole period between 1980 and 2017 (Table 6).

The correlation between capital inflows and GDP growth was significant during 1980-2009, especially in the 1990s, as massive capital investment was made in those periods. However, during the post-Lehman shock period after 2010s capital inflows have not directly correlated with GDP growth in major emerging economies, as shown the regression result during 2010-17.

During the period 2010-17 domestic savings were only single positive and significant correlated with GDP growth. This could suggest that several capital management and controls introduced after the Global Financial Crisis has put less dependent on capital flows in larger emerging economies during 2010s.

The trade variable (export + import per GDP) had only correlated with GDP Growth during the period 1990-99, while there are no significant association during other periods. This could indicate that GDP growth in large emerging economies have much been influenced by several other factors.

It is to be noted that Latin American economies (Argentina, Brazil, Mexico) has negative correlation with all the equations during 2010-17, which is contrary to the case of Asian countries.

5. Concluding remarks

The analysis in this paper shows that domestic savings are still one of the major factors for domestic investment, and that capital inflows and external trade would not guarantee domestic investment and GDP growth in emerging countries. The results indicate that while the correlation between domestic saving and investment has constantly declined in emerging countries during 1990s and 2000s, the nexus of saving and investment as well as GDP growth has gained significance investment in the post-Global Financial Crisis (2010-2017). On the other hand, capital inflows have had no positive correlation with GDP growth nor domestics during the period. Some implications from the analyses and discussion in this paper could be given as follows:

Firstly, the correlation between savings and investment has been significantly affected by the capital account liberalization in the past decades, however, the correlation nexus of domestic savings and investment has not been changed significantly in emerging economies during the whole period. This would indicate that Feldstein-Horioka puzzle of home bias somehow still hold even in recent decades when capital account openness in each country has drastically increased in emerging economies.

Secondly, in the post-Global Financial Crisis period (2010-17) the correlation between savings and investment has recovered; the correlation between savings and investment has been generally higher in the Post Global Financial Period (2010-17) in emerging countries. This could be explained by the fact that several countries have introduced several capital management and controls through prudential monitors and controls after the Global Financial Crisis.

Thirdly, capital flows have no more significant correlation with domestic investment and growth in emerging economies since 2010. This may indicate that capital flows have not contributed to productive investment in emerging economies due to massive financial investment undertaken recently.

Fourthly, there are significant differences between major emerging countries (EM7) and other smaller emerging economies in the sense that the degree of home bias has been lager in the former countries than the latter.

Fifth, GDP growth nexus domestic savings is still valid in the sense that there have been correlation between them in the past decades, while the significance is larger in larger emerging countries (EM7) than smaller nations.

The above results in this paper show that the correlation between savings and investment in emerging economies had been lower in the past decades with capital and financial account liberalization until 2000s. However, such a trend has now been reversed: many countries have recovered the domestic savings and investment nexus during 2010s. It could be explained by the fact that several emerging economies have been stabilized and expanded domestic resources. Besides, most of the countries have now realized that dependence of domestic economic activities on external capital could increase risk in terms of stability of their economies. It is to be noted that capital management and controls as well as stronger prudential controls and regulations have been introduced in many Asian countries, especially since mid-2000s[13].

In many countries dependence on external financial resources for domestic economic activities, including investment generally could have relatively high risks in balance of payments, especially capital and financial account, which includes short-term capital flows, that could easily affect stable economic growth. This is because economic growth in those countries which are heavily dependent on capital inflows are more likely to have higher volatility in the markets and the economy with pro-cyclical nature and vulnerable to the external shocks of global markets. Some countries may be exempted from such higher risks, like the USA where the dollar is the key currency so that the country could easily be financed by imports of capital through issuing government bonds (e.g. T-bills). Small open economies of emerging members, however, are very vulnerable to the global conditions which may deteriorate at any moment, and in such a situation massive capital outflows and/or 'sudden stops' of capital inflows could take place. The lack of financial resources could be a serious issue especially for those countries with lower domestic savings. Thus, there should be absolute needs for sustainable domestic investment for stable economic growth and development.

As shown in the result of analysis in this paper, increase in domestic saving rates would be one of the most important issues for any country to achieve more stable and sustainable economic growth, avoiding pro-cyclical capital flows which are influenced by the global financial markets. Therefore, it would be necessary to establish some mechanism and framework to promote mobilizing domestic resources to be utilized effectively in productive investment in a country.

In this respect, there should be several measures to strengthen management and controls in capital and financial transactions in the global market. The results of the analysis shown in this paper would justify several measures to strengthen management and controls in capital and financial transactions in the global market, to achieve more stable growth.

[Notes]

Variables used for calculation of investment/saving regression for emerging countries are mainly based on the World Bank/ IMF database.

The variables of investment and savings for each country used are as follows:

[IMF]
・Capital and financial account balance (% of GDP) data are based on the IMF database.

[World Bank]
・GDP Growth rate (real GDP growth rate)　　(%)

---

[13] Several measures for management and controls in capital/financial account are shown in several literatures (e.g. Chapter 6 of Ohta [2012], Kawai & Takagi [2010]), Fernandez et al. [2015]).

・Trade figures [exports and imports]　　(% of GDP)

・Gross Capital Formation (formerly gross domestic investment) (% of GDP): consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.
・Gross Savings (% of GDP): gross national income less total consumption, plus net transfers

References

Aghion.P., Comin, D. and Howitt, P. (2006). When Does Domestic Saving Matter for Economic Growth? *NBER Working Paper* No.12275, NBER

Aguiar, Mark and Gopinah, Gita (2007). Emerging market cycles:　is the trend, *Journal of Political Economy*,115-102.

Aizenman, J., Pinto.B. and Radziwill, A. (2004). Sources for Financing Domestic Capital — Is Foreign Saving a Viable Option for Developing Counties?　*NBER Working Paper* No.10624, NBER

Amirkhalkhali, S., Dar, A. and Amirkhalkhali, S. (2003). Saving-investment correlations, capital mobility and crowding out: some further evidence, *Economic Modelling*, 20, 1137-1149.

Apergis, N. and Tsoumas, C. (2009). A survey on the Feldstein-Horioka puzzle: what has been done and where we stand, *Research in Economics, Financial Research in Economics*, Volume 63, Issue 2, June 2009, 64–76.

Bacha, E.L (1990). A Three-Gap Model of Foreign Transfers and the GDP Growth Rate in Developing Countries, *Journal of Development Economics*, Vol.32, 279-96.

Bahmani-Oskooee, M. and Chakrabarti A. (2005). Openness, size, and the saving-investment relationship, *Economic Systems,* Vol.29, issue 3: 283-293.

Bandiera, Oriena, Caprio, G., Honohan, P. and Schiantarelli, F.(2000). Does Financial Reform Raise or Reduce Saving? *The Review of Economics and Statistics*, Vol.82, 239-263.

Bodman, P. M. (1995). National savings and domestic investment in the long-term: some time-series evidence from the OECD, *International Economic Journal*, 9, 37-60. No.2, 99.239-263, May

Bosworth, Barry P. and Collin, Susan M., (1999). Capital Flows to Developing Countries: Implications for Saving and Investment, *Brookings Papers on Economic Activity*, No.2, 113-79.

Caporale, G. M., E. Panopoulou, and N. Pittis (2005) The Feldstein–Horioka puzzle revisited: A Monte Carlo study, *Journal of International Money and Finance*, Vol.24-7: 1143-1149.

Carroll, C.D., and Weil, D.N. (1994). Saving and Growth; A Reinterpretation, *Carnegie-Rochester Conference Series on Public Policy*, Vol.40, 133-192.

Chakrabarti, A. (2006). The saving-investment relationship revisited: new evidence from multivariate heterogeneous panel co-integration analyses, *Journal of Comparative Economics,* 34, 402-419.

Chang, Roberto and Fernandez, Andres (2010). On the sources of aggregate fluctuations in emerging economies, *NBER Working Paper* 15938, April.

Chang, Yanqin and Todd, Smith R. (2014). Feldstein-Horioka Puzzle, *European Economic Review* 72(2014)98–112.

Chinn, Menzie and Hiro Ito (2018) The Chinn-Ito Index– A de jure measure of financial openness –, http://web.pdx.edu/~ito/Chinn-Ito_website.htm

Christopoulos, D. K. (2007). A reassessment of the Feldstein-Horioka hypothesis of perfect capital mobility: evidence from historical data, *Empirica,* 34, 273-280.

De Gregorio, J. (1992). Economic Growth in Latin America, *Journal of Development Economics*, Vol.39, 59-84.

Di Iorio, F. and Fachin, S. (2007). Testing for breaks in cointegrated panels－with an application to the Feldstein-Horioka puzzle,' Economics－The Open-Access, *Open-Assessment E-Journal*, 1, 1-30.

Feldstein, M. & Horioka, C. (1980). Domestic Saving and International Capital Flows. *Economic Journal,* 90(358), 314-329.

Fernández, A., Klein Michael W., A. Rebucci, M. Schindler, M. Uribe (2015). Capital Conctrol Measures: A New Dataset, *NBER Working Paper* 20970, February 2015

Ford, Nicholas and C.Y. Horioka (2016). The "Real" Explanation of the Feldstein-Horioka Puzzle, *NBER Working Paper* 22081, March 2016.

Fouquau, J., Hurlin, C. and Rabaud, I. (2009). The Feldstein-Horioka puzzle: A panel smooth transition regression approach, *Economic Modelling*, 25, 284-299.

Giannone, Domenico and Lenza, Michele (2008) . "The Feldstein-Horioka Fact, "*ECB Working Paper Series* No 873, February.

Grier, K., Lin, S. and Ye, H. (2008) 'Savings and investment in the USA: Solving the Feldstein Horioka puzzle,' available from http://home.fau.edu/slin1/web/fh.pdf.

Hassan, Ibrahim Bakari, M. Azali, C. Lee (2014).Feldstein-Horioka Puzzle and International Capital Mobility in High Income Countries: A Pool Mean Group Approach, *Inzinerine Ekonomika-Engineering Economics*, 2014, 25(5), 480–486

Herwartz, H. and Xu, F. (2009). 'Panel data model comparison for empirical saving-investment relations,' Applied *Economics Letters*, Vol.9 Issue8, 803-807

Jappelli, T. and Pagano, M. (1994)."Savings, Growth and Liquidity Constraints", *Quarterly Journal of Economics*, 109, 83-119.

Kasuga, Hidefumi (2004). Saving-investment correlations in developing countries, *Economics Letters,* 83: 371-376.

Kawai, Masahiro and Takagi, Shinji (2010). A Survey of the literature on managing capital inflows, in M.Kawai and B.Lamberte ed. *Managing Capital Flows*, ADB Institute, Tokyo.

Kitamura, Yukinobu and Fujiki, Yutaka (1995)*. Application of Panel Data based Analysis in International Comparative studies: Re-examination of Feldstein-Horioka Paradox, *Kinnyu Kenkyu* Vol.14, No.1, Institute for Monetary and Economic Studies, Bank of Japan, March 1995.

Krieckhaus, Jonathan (2002). Reconceptualising the Developmental State: Public Savings and Economic Growth, *World Development*, Vol.30, No.10, 1697-1712.

Kumar, Saten and Rao, B.Bhaskara (2011). A Time Series Approach to the Feldstein-Horioka Puzzle with Panel Data from the OECD Countries, *The World Economy*, Volume 34, Issue 3, 473–485.

Mercan, Mehmet (2014). The Testing Feldstein-Horioka Hypothesis For EU-15 and Turkey: Structural Break, Dynamic Panel Data Analysis Under Cross Section Dependency. *Age Academic Review*, Vol.14 No. 2, 231-245.

Misztal, Piotr (2011). The Feldstein-Horioka Hypothesis in Countries with Varied levels of Economic Development, *Contemporary Economics*, Vol. 5 Issue 2 2011 , 6-29.

Mohan, Ramesh (2006). Causal Relationship between Savings and Economic Growth in Countries with Different Income Levels, *Economic Bulletin,* Vol.5, No.3, 1-12

Mosikari, T.J., J.T. Tsoku, and D.L. Xaba (2017). Testing the Validity of Feldstein-Horioka Puzzle in BRICS Countries*, International Journal of Economics and Management Engineering*, Vol.11No.4: 1009-1013.

Mu-Shung, Wang (2013). An Investigation of the Feldstein-Horioka Puzzle for the Association of Southeast Asian Nations Economies, *The Australian Economic Review,*

vol. 46, no. 4, pp. 424–43

Obstfeld, M. and Rogoff, K. (2000). The Six Major Puzzles in International Macroeconomics: Is there a Common Cause?, *NBER Working Paper* 7777.

Ohta, Hideaki (2008)*. Solved Feldstein-Horioka Puzzle: The Effects of Capital Inflows on Domestic Savings and Investment, *Ehime Economic Journal,* Vol.27, No.1, March 2008.

Ohta, Hideaki (2012)*. *Economics of Capital Controls*, Nihon Hyoronsha, Publishing.

Ohta, Hideaki (2015). The Effects of International Capital Flows on Domestic Savings, Investment and Growth: Facts on 'F-H Puzzle' in OECD and Emerging Economies, *Ritsumeikan Annual Review of International Studies*, Vol.14:73-101.

Rajan, R., Prasad, E. and Subramanian, A. (2006). Foreign Capital and Economic Growth, Research Department, IMF, August 11, 2006

Rao, B. Bhaskara, Tamazian, Artur and Kumar, Saten (2014). Systems GMM estimates of the Feldstein-Horioka puzzle for the OECD countries and tests for structural breaks, *MPRA_paper_*15312.

Singh, Tarlok (2016). Rhetorics of saving–investment correlations and the international mobility of capital: A survey, The Jurnal of International Trade and Economic Development, Vol.25(5):636-690.

Tsoukis, Christopher and Alyousha, Ahmed (2001). The Feldstein-Horioka Puzzle, Saving-Investment Causality and International Financial Market Integration, *Journal of Economic Integration* 16(2), June 2001, 262-277.

Uribe, Martin and Schmitt-Groh, Stephanie(2015). *Open Economy Macroeconomics*, November. Manuscript.

Ventura, Jaume (2003). Towards a Theory of Current Accounts, *The World Economy*, Volume26, Issue 4, 483-512.

Wahid, A.N.M. A.M. Noman, M. Salabuddion (2011). Savings–Investment Correlation in Developing Countries: A Challenge to the Coakley-Rocha Findings, *The First International Conference on Interdisciplinary Research and Development*, 31 May - 1 June 2011, Thailand

Younas, Javed (2011). Role of foreign direct investment in estimating capital mobility: a reappraisal of Feldstein-Horioka puzzle, *Applied Economics Letters*, 2011, 18, 1133–1137

* Written in Japanese

[Appendix] 1: Domestic Savings/ Investment

Domestic Savings (%, GDP)

	80-84	85-89	90-94	95-99	00-04	05-09	10-14	15-17	80-89	90-99	00-09	10-17
Argentina	19.5	15.8	14.9	15.1	17.2	20.9	16.4	13.0	17.6	15.0	19.0	14.7
Brazil	16.0	23.6	19.5	12.3	14.5	16.4	17.8	14.3	19.8	15.9	15.5	16.0
Chile	7.8	16.7	23.6	23.3	21.4	23.9	22.6	20.4	12.3	23.5	22.6	21.5
Mexico	22.5	20.7	18.7	16.6	16.6	22.4	22.2	21.1	21.6	17.6	19.5	21.7
Colombia	15.8	20.5	19.9	14.7	14.5	18.6	19.0	18.3	18.1	17.3	16.5	18.7
Peru	26.0	16.3	13.5	17.4	17.1	22.2	22.3	20.0	21.1	15.5	19.6	21.1
Venezuela	24.9	19.1	20.2	27.4	31.8	35.5	23.1	—	22.0	23.8	33.6	23.1
Costa Rica	11.9	12.8	13.6	13.3	14.9	15.8	14.0	14.4	12.4	13.5	15.3	14.2
Ecuardor	18.5	14.5	17.5	17.0	20.3	26.3	27.1	25.5	16.5	17.3	23.3	26.3
China	34.1	37.2	40.5	39.0	40.6	50.3	49.8	46.4	35.7	39.7	45.5	48.1
India	20.0	22.9	26.0	28.3	30.9	38.5	34.9	30.5	21.5	27.2	34.7	32.7
Indonesia	21.0	25.9	28.9	28.0	27.1	27.5	32.0	31.9	23.4	28.4	27.3	31.9
Korea	27.8	37.7	38.6	36.7	33.3	32.9	34.6	35.9	32.7	37.7	33.1	35.2
Malaysia	23.6	26.7	32.2	37.2	34.2	37.3	31.5	28.3	25.1	34.7	35.7	29.9
Philippines	21.3	16.5	19.3	25.1	42.8	44.9	45.5	44.0	18.9	22.2	43.9	44.7
Pakistan	26.8	22.8	23.3	19.4	24.8	21.1	21.5	22.3	24.8	21.3	23.0	21.9
Thailand	23.2	27.9	34.4	32.7	27.2	29.1	28.0	31.7	25.5	33.5	28.2	29.8
Singapore	38.6	39.9	45.4	51.2	41.6	46.0	48.8	46.1	39.2	48.3	43.8	47.4
Turkey	13.7	20.5	21.6	21.6	21.0	23.1	22.8	24.9	17.1	21.6	22.0	23.9
Egypt	21.2	22.4	29.9	19.6	18.9	21.8	14.7	10.1	21.8	24.7	20.3	12.4
Israel	13.9	17.5	20.6	21.8	20.8	23.2	22.8	24.6	15.7	21.2	22.0	23.7
Morocco	23.6	26.5	26.4	24.8	30.6	32.8	27.3	29.0	25.0	25.6	31.7	28.2
Tunisia	25.1	22.3	21.7	21.8	21.2	21.2	16.3	10.0	23.7	21.7	21.2	13.2
South Africa	27.1	24.6	18.8	16.7	16.3	16.4	16.2	16.4	25.9	17.8	16.3	16.3
Nigeria	22.5	18.2	17.8	8.7	12.5	23.0	25.2	16.5	20.4	13.3	17.8	20.9

Domestic Investment (%, GDP)

	80-84	85-89	90-94	95-99	00-04	05-09	10-14	15-17	80-89	90-99	00-09	10-17
Argentina	22.1	17.8	16.9	18.7	15.0	18.7	17.4	17.7	19.9	17.8	16.8	17.6
Brazil	20.0	22.0	20.5	17.6	18.0	19.1	21.5	16.1	21.0	19.1	18.5	18.8
Chile	17.7	21.3	25.6	26.2	21.5	22.3	24.6	22.7	19.5	25.9	21.9	23.7
Mexico	23.6	20.9	23.5	22.3	21.4	23.0	22.9	23.4	22.3	22.9	22.2	23.1
Colombia	19.8	19.0	19.6	20.3	17.3	22.3	24.1	24.9	19.4	19.9	19.8	24.5
Peru	30.0	22.2	18.5	23.0	18.0	21.0	24.6	22.4	26.1	20.7	19.5	23.5
Venezuela	21.8	21.1	17.1	23.9	22.0	26.6	24.7	—	21.5	20.5	24.3	24.7
Costa Rica	22.2	17.0	20.0	20.4	19.8	21.4	19.6	18.1	19.6	20.2	20.6	18.8
Ecuardor	22.5	24.2	22.2	20.5	21.4	23.8	28.2	25.8	23.4	21.3	22.6	27.0
China	33.9	38.9	39.1	37.0	38.3	42.7	47.4	44.4	36.4	38.1	40.5	45.9
India	21.1	24.3	26.3	27.9	29.6	39.9	37.4	31.0	22.7	27.1	34.8	34.2
Indonesia	23.8	28.0	30.5	28.4	23.2	26.8	33.9	33.8	25.9	29.5	25.0	33.8
Korea	32.8	34.0	39.1	35.0	31.9	31.8	30.9	29.7	33.4	37.0	31.9	30.3
Malaysia	31.9	24.3	37.2	35.4	24.4	21.6	24.6	25.5	28.1	36.3	23.0	25.1
Philippines	26.9	17.5	22.8	22.7	21.9	18.6	20.0	23.5	22.2	22.7	20.2	21.7
Pakistan	18.7	18.6	19.7	17.7	16.8	18.8	14.9	15.8	18.7	18.7	17.8	15.4
Thailand	29.0	29.9	40.9	32.0	23.5	26.4	26.3	21.9	29.4	36.5	24.9	24.1
Singapore	45.9	36.4	35.0	34.3	25.8	25.0	29.2	27.3	41.1	34.6	25.4	28.2
Turkey	17.1	21.9	23.7	24.1	22.2	27.5	29.1	29.2	19.5	23.9	24.8	29.1
Egypt	28.7	28.6	22.0	19.8	17.9	19.8	16.1	14.9	28.6	20.9	18.9	15.5
Israel	20.9	17.6	23.6	24.7	21.1	20.1	20.0	20.1	19.2	24.1	20.6	20.1
Morocco	30.6	27.6	27.6	25.7	28.2	33.8	34.3	32.2	29.1	26.7	31.0	33.3
Tunisia	32.6	25.0	27.2	24.5	24.0	24.0	24.4	20.0	28.8	26.0	24.3	22.2
South Africa	28.9	21.0	17.6	18.0	16.8	20.7	20.2	19.6	25.0	17.8	18.7	19.9
Nigeria	12.9	11.7	7.7	7.5	11.0	15.8	15.8	15.4	12.3	7.6	13.4	15.6

Notes: 1 Countries include Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuardor, Peru, Venezuela, China,
India, Indonesia, Korea, Malaysia, Philippines, Pakistan, Thailand, Singapore, Turkey, Egypt,
Israel, Morocco, Nigeria, South Africa, Tunisia China's savings rate is from 1982; Indonesia from 1981.
2 Domestic Saviings= Gross Savings; gross national income less total consumption, plus net transfers.
Domestic Investment =Gross Capital Formation, defineds as :outlays on additions
to the fixed assets of the economy plus net changes in the level of inventories
Sources: World Bank database

(S-I)/GDP

	80-84	85-89	90-94	95-99	00-04	05-09	10-14	15-17	80-89	90-99	00-09	10-17
Argentina	-2.63	-1.97	-1.97	-3.54	2.17	2.22	-1.03	-4.72	-2.30	-2.76	2.20	-2.88
Brazil	-3.97	1.51	-1.06	-5.31	-3.43	-2.66	-3.67	-1.80	-1.23	-3.19	-3.04	-2.74
Chile	-9.90	-4.58	-1.97	-2.88	-0.11	1.60	-2.02	-2.25	-7.24	-2.42	0.74	-2.14
Mexico	-1.13	-0.15	-4.87	-5.69	-4.80	-0.64	-0.62	-2.26	-0.64	-5.28	-2.72	-1.44
Colombia	-4.05	1.45	0.30	-5.64	-2.75	-3.75	-5.10	-6.61	-1.30	-2.67	-3.25	-5.85
Peru	-4.07	-5.97	-4.94	-5.59	-0.91	1.15	-2.29	-2.44	-5.02	-5.26	0.12	-2.37
Venezuela	3.18	-2.02	3.06	3.48	9.82	8.91	-1.63	—	0.58	3.27	9.36	-1.63
Costa Rica	-10.31	-4.16	-6.39	-7.07	-4.84	-5.65	-5.61	-3.68	-7.23	-6.73	-5.25	-4.64
Ecuardor	-4.01	-9.68	-4.68	-3.42	-1.16	2.57	-1.01	-0.34	-6.85	-4.05	0.70	-0.68
China	0.16	-1.67	1.36	1.98	2.30	7.61	2.40	1.99	-0.76	1.67	4.96	2.20
India	-1.09	-1.38	-0.27	0.38	1.23	-1.45	-2.51	-0.45	-1.24	0.06	-0.11	-1.48
Indonesia	-2.85	-2.08	-1.67	-0.38	3.90	0.65	-1.92	-1.91	-2.47	-1.02	2.28	-1.91
Korea	-5.06	3.71	-0.50	1.78	1.42	1.15	3.69	6.18	-0.68	0.64	1.28	4.93
Malaysia	-8.27	2.34	-4.95	1.79	9.81	15.69	6.80	2.82	-2.97	-1.58	12.75	4.81
Philippines	-5.60	-0.97	-3.43	2.35	20.89	26.34	25.52	20.51	-3.29	-0.54	23.62	23.02
Pakistan	8.07	4.16	3.58	1.62	7.98	2.34	6.57	6.42	6.11	2.60	5.16	6.50
Thailand	-5.75	-2.04	-6.58	0.72	3.67	2.78	1.65	9.78	-3.90	-2.93	3.23	5.71
Singapore	-7.34	3.55	10.42	16.93	15.83	20.91	19.56	18.80	-1.89	13.68	18.37	19.18
Turkey	-3.41	-1.44	-2.14	-2.47	-1.16	-4.37	-6.23	-4.27	-2.43	-2.30	-2.76	-5.25
Egypt	-7.44	-6.20	7.88	-0.20	0.97	1.94	-1.44	-4.76	-6.82	3.84	1.45	-3.10
Israel	-7.04	-0.14	-2.98	-2.88	-0.28	3.16	2.72	4.49	-3.59	-2.93	1.44	3.60
Morocco	-6.98	-1.11	-1.28	-0.84	2.34	-1.07	-7.06	-3.12	-4.05	-1.06	0.63	-5.09
Tunisia	-7.51	-2.68	-5.58	-2.93	-3.29	-2.88	-8.03	-10.00	-5.09	-4.25	-3.08	-9.01
South Africa	-1.85	3.65	1.20	-1.28	-0.51	-4.26	-3.94	-3.28	0.90	-0.04	-2.38	-3.61
Nigeria	9.66	6.49	10.14	1.27	1.48	7.20	9.42	1.07	8.08	5.70	4.34	5.24

(S-I)/S

	80-84	85-89	90-94	95-99	00-04	05-09	10-14	15-17	80-89	90-99	00-09	10-17
Argentina	-0.14	-0.12	-0.13	-0.23	0.13	0.11	-0.06	-0.36	-0.13	-0.18	0.12	-0.20
Brazil	-0.25	0.06	-0.05	-0.43	-0.24	-0.16	-0.21	-0.13	-0.06	-0.20	-0.20	-0.17
Chile	-1.27	-0.27	-0.08	-0.12	-0.01	0.07	-0.09	-0.11	-0.59	-0.10	0.03	-0.10
Mexico	-0.05	-0.01	-0.26	-0.34	-0.29	-0.03	-0.03	-0.11	-0.03	-0.30	-0.14	-0.07
Colombia	-0.26	0.07	0.02	-0.39	-0.19	-0.20	-0.27	-0.36	-0.07	-0.15	-0.20	-0.31
Peru	-0.16	-0.37	-0.37	-0.32	-0.05	0.05	-0.10	-0.12	-0.24	-0.34	0.01	-0.11
Venezuela	0.13	-0.11	0.15	0.13	0.31	0.25	-0.07	—	0.03	0.14	0.28	-0.07
Costa Rica	-0.87	-0.32	-0.47	-0.53	-0.32	-0.36	-0.40	-0.25	-0.59	-0.50	-0.34	-0.33
Ecuardor	-0.22	-0.67	-0.27	-0.20	-0.06	0.10	-0.04	-0.01	-0.41	-0.23	0.03	-0.03
China	0.00	-0.04	0.03	0.05	0.06	0.15	0.05	0.04	-0.02	0.04	0.11	0.05
India	-0.05	-0.06	-0.01	0.01	0.04	-0.04	-0.07	-0.01	-0.06	0.00	0.00	-0.05
Indonesia	-0.14	-0.08	-0.06	-0.01	0.14	0.02	-0.06	-0.06	-0.11	-0.04	0.08	-0.06
Korea	-0.18	0.10	-0.01	0.05	0.04	0.03	0.11	0.17	-0.02	0.02	0.04	0.14
Malaysia	-0.35	0.09	-0.15	0.05	0.29	0.42	0.22	0.10	-0.12	-0.05	0.36	0.16
Philippines	-0.26	-0.06	-0.18	0.09	0.49	0.59	0.56	0.47	-0.17	-0.02	0.54	0.51
Pakistan	0.30	0.18	0.15	0.08	0.32	0.11	0.31	0.29	0.25	0.12	0.22	0.30
Thailand	-0.25	-0.07	-0.19	0.02	0.14	0.10	0.06	0.31	-0.15	-0.09	0.11	0.19
Singapore	-0.19	0.09	0.23	0.33	0.38	0.46	0.40	0.41	-0.05	0.28	0.42	0.40
Turkey	-0.25	-0.07	-0.10	-0.11	-0.06	-0.19	-0.27	-0.17	-0.14	-0.11	-0.13	-0.22
Egypt	-0.35	-0.28	0.26	-0.01	0.05	0.09	-0.10	-0.47	-0.31	0.16	0.07	-0.25
Israel	-0.51	-0.01	-0.14	-0.13	-0.01	0.14	0.12	0.18	-0.23	-0.14	0.07	0.15
Morocco	-0.30	-0.04	-0.05	-0.03	0.08	-0.03	-0.26	-0.11	-0.16	-0.04	0.02	-0.18
Tunisia	-0.30	-0.12	-0.26	-0.13	-0.15	-0.14	-0.49	-1.00	-0.22	-0.20	-0.15	-0.68
South Africa	-0.07	0.15	0.06	-0.08	-0.03	-0.26	-0.24	-0.20	0.03	0.00	-0.15	-0.22
Nigeria	0.43	0.36	0.57	0.14	0.12	0.31	0.37	0.06	0.40	0.43	0.24	0.25

Notes: 1 Countries include OECD (Austraria, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxemburg, Netherland,New Zealand, Norway, Spain, Sweden, Switzerland, U.K., USA) The figures of capital Inflows for Belgium and Luxemburg are from 2002 to 2017, for Greece from 1976 and Switzerland from 1977.

2 The figures of savings for Greece, Japan are from 1976;Luxemburg and Switzerland are from 1980 and 1981..
The figures of savings for Japan, New Zealand, and the US are until 2016.

3 Domestic Saviings= Gross Savings; gross national income less total consumption, plus net transfers.
Domestic Investment =Gross Capital Formation (WB), defineds as :outlays on additions

Source: World Bank Database

2: Capital Inflows / Trade

	Capital Inflows (%, GDP)												
	75-79	80-84	85-89	90-94	95-99	00-04	05-09	10-14	15-17	80-89	90-99	00-09	10-17
Argentina	1.55	0.12	-1.81	2.58	4.74	-8.74	0.45	0.87	4.81	-0.85	3.66	-4.14	2.84
Brazil	4.59	1.55	-3.14	0.53	2.84	1.37	3.00	4.38	1.69	-0.79	1.69	2.19	3.04
Chile	5.62	2.44	-4.46	6.67	4.22	0.82	-0.42	2.70	1.25	-1.01	5.45	0.20	1.98
Mexico	3.86	3.23	-0.64	5.68	2.43	3.09	1.92	4.33	2.38	1.29	4.05	2.51	3.35
Colombia	1.22	4.10	2.67	1.49	4.14	1.44	3.12	4.76	4.77	3.38	2.82	2.28	4.76
Peru	0.49	0.80	-7.37	1.95	5.51	2.64	4.16	6.39	3.30	-3.29	3.73	3.40	4.84
Venezuela	3.52	-2.47	-2.17	0.06	-0.63	-5.79	-7.71	-2.14	0.00	-2.32	-0.28	-6.75	-1.07
Costa Rica	10.53	-2.56	-5.24	0.58	2.39	3.77	6.85	6.91	3.91	-3.90	1.49	5.31	5.41
Ecuardor	15.29	-3.55	-12.75	4.95	0.22	-5.49	-4.76	1.33	0.50	-8.15	2.59	-5.13	0.91
China	0.00	-0.11	2.09	2.80	2.39	2.76	2.45	2.10	-2.14	0.99	2.59	2.61	-0.02
India	0.65	0.70	2.01	2.06	2.13	2.44	4.24	3.73	2.46	1.36	2.10	3.34	3.09
Indonesia	0.00	4.70	3.31	3.93	-0.95	-2.15	0.12	3.05	2.68	4.01	1.49	-1.02	2.86
Korea	7.30	6.52	-2.55	1.66	2.03	1.19	0.14	-2.88	-6.46	1.99	1.84	0.66	-4.67
Malaysia	3.73	10.43	0.65	9.63	1.66	-2.56	-9.17	-2.24	-3.11	5.54	5.65	-5.87	-2.68
Philippines	5.33	4.62	1.44	6.23	6.84	0.65	-0.84	1.51	-0.07	3.03	6.53	-0.09	0.72
Pakistan	3.68	2.01	2.90	4.64	1.30	-2.36	4.56	1.19	2.91	2.46	2.97	1.10	2.05
Thailand	4.92	5.63	4.22	9.51	-1.12	-2.30	2.76	0.64	-4.42	4.93	4.20	0.23	-1.89
Singapore	11.42	12.96	2.42	1.19	-11.61	-10.90	-12.49	-11.70	-15.88	7.69	-5.21	-11.69	-13.79
Turkey	1.31	0.66	1.25	1.03	2.21	0.61	5.93	7.29	2.79	0.95	1.62	3.27	5.04
Egypt	1.35	5.10	2.64	-8.63	-0.41	-3.56	2.46	0.39	8.66	3.87	-4.52	-0.55	4.53
Israel	6.40	6.83	-1.76	506.45	5.69	-1.24	-1.73	-2.03	-1.11	3.67	5.37	-1.49	-1.57
Morocco	17.35	6.21	2.21	4.15	-1.78	-1.91	0.14	3.37	4.58	4.21	1.19	-0.89	3.97
Tunisia	8.47	6.27	3.01	5.57	3.63	3.78	5.25	5.81	7.03	4.64	4.60	4.52	6.42
South Africa	0.02	0.03	-1.92	-0.48	2.98	0.11	5.68	5.12	3.79	-0.95	1.25	2.90	4.46
Nigeria	2.48	0.96	-13.05	-10.91	-2.78	-12.32	-8.59	-0.34	0.10	-6.05	-6.85	-10.46	-0.12
	Trade (%、GDP)												
	75-79	80-84	85-89	90-94	95-99	00-04	05-09	10-14	15-17	80-89	90-99	00-09	10-17
Argentina	14.20	14.47	16.06	16.52	22.44	37.10	38.16	31.69	24.54	4.64	4.60	4.52	6.42
Brazil	16.30	19.45	15.39	18.35	18.45	27.89	24.64	24.25	25.22	-0.95	1.25	2.90	4.46
Chile	45.57	45.40	57.88	55.23	55.74	66.84	73.14	67.96	56.72	-6.05	-6.85	-10.46	-0.12
Mexico	20.11	25.63	35.70	35.20	50.65	52.97	57.48	63.75	75.00	30.66	42.92	55.22	69.38
Colombia	30.01	26.59	31.61	35.06	35.27	34.98	36.11	37.14	36.65	29.10	35.17	35.54	36.89
Peru	37.25	42.88	29.42	28.52	33.36	39.45	53.14	51.37	45.75	36.15	30.94	46.29	48.56
Venezuela	51.49	44.13	49.50	53.81	48.52	51.36	50.27	49.71	-1.42	46.82	51.17	50.81	24.14
Costa Rica	65.59	69.44	60.63	77.30	87.97	84.18	80.50	67.70	64.95	65.04	82.63	82.34	66.32
Ecuardor	34.65	32.83	40.64	44.57	48.26	50.83	60.55	60.77	42.04	36.74	46.42	55.69	51.40
China	9.50	17.45	24.84	32.44	34.74	50.96	55.51	47.81	38.10	21.14	33.59	53.23	42.95
India	13.26	14.26	13.94	19.82	24.25	33.48	48.60	52.77	40.98	14.10	22.03	41.04	46.88
Indonesia	45.49	50.98	47.44	53.73	67.77	61.25	52.45	48.64	39.64	49.21	60.75	56.85	44.14
Korea	54.10	60.37	57.63	49.83	62.30	66.28	87.36	102.72	80.73	59.00	56.06	76.82	91.73
Malaysia	94.83	109.15	125.00	167.98	202.98	202.23	178.44	148.35	132.71	117.07	185.48	190.34	140.53
Philippines	46.34	48.99	55.22	70.20	99.27	100.74	78.97	65.15	66.08	52.10	84.74	89.86	65.61
Pakistan	30.56	34.24	35.72	36.73	33.93	31.86	33.84	32.57	26.25	34.98	35.33	32.85	29.41
Thailand	45.10	50.10	64.40	81.04	100.31	123.44	130.18	134.13	82.52	57.25	90.67	126.81	108.32
Singapore	325.26	355.78	334.63	321.96	335.77	383.80	401.02	369.75	320.58	345.20	328.86	392.41	345.16
Turkey	13.25	27.38	32.78	36.24	44.80	47.20	47.44	50.51	50.10	30.08	40.52	47.32	50.31
Egypt	62.05	66.09	46.43	55.94	42.00	49.55	60.55	42.24	36.55	56.26	48.97	55.05	39.40
Israel	112.49	98.14	86.80	74.91	64.10	72.74	74.60	67.85	39.33	92.47	69.51	73.67	53.59
Morocco	51.60	55.40	51.01	49.75	52.44	61.56	75.76	81.00	80.09	53.21	51.09	68.66	80.54
Tunisia	69.06	81.00	81.59	89.32	81.31	86.90	102.71	105.32	94.54	81.30	85.32	94.80	99.93
South Africa	56.04	52.27	47.61	39.81	48.14	54.04	61.65	61.14	60.19	49.94	43.98	57.84	60.66
Nigeria	43.58	35.19	42.82	57.22	65.59	63.92	70.40	40.35	14.02	39.01	61.40	61.81	27.19

Notes: 1 Countries include Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuardor, Peru, Venezuela, China,
India, Indonesia, Korea, Malaysia, Philippines, Pakistan, Thailand, Singapore, Turkey, Egypt,
Israel, Morocco, Nigeria, South Africa, Tunisia China's savings rate is from 1982; Indonesia from 1981.
2 Capital Inflows: Net capital inflows per GDP Trade: Exports + Imports (%, GDP)
Sources: Balance of Payments statistics (IMF); World Bank database (trade)

3: GDP Growth

													(%, y/y)
	75-79	80-84	85-89	90-94	95-99	00-04	05-09	14-10	15-17	80-89	90-99	00-09	10-17
Argentina	2.1	-0.1	-1.4	6.8	2.3	0.4	4.8	3.0	1.3	-0.7	4.5	2.6	2.1
Brazil	5.9	1.4	4.5	1.6	2.2	3.1	3.6	3.4	-2.0	3.0	1.9	3.4	0.7
Chile	3.5	0.5	6.6	6.8	5.4	4.6	3.8	4.6	1.7	3.6	6.1	4.2	3.2
Mexico	6.4	3.4	1.2	4.1	3.0	2.0	1.0	3.3	2.7	2.3	3.6	1.5	3.0
Colombia	5.0	2.4	4.4	4.3	1.4	3.6	4.7	4.8	2.3	3.4	2.9	4.1	3.5
Peru	1.5	0.9	-0.1	2.8	3.6	3.6	6.5	5.8	3.2	0.4	3.2	5.0	4.5
Venezuela	4.0	-1.8	1.5	4.0	0.9	1.8	6.2	1.2	—	-0.2	2.5	4.0	1.2
Costa Rica	5.5	0.1	4.5	5.4	4.4	3.8	4.6	4.0	3.7	2.3	4.9	4.2	3.8
Ecuardor	5.9	2.4	2.8	3.3	1.4	4.0	3.8	5.2	0.5	2.6	2.3	3.9	2.8
China	6.8	9.6	9.9	10.9	9.1	9.2	11.5	8.6	6.8	9.7	10.0	10.4	7.7
India	3.7	5.5	5.9	4.7	6.8	5.7	8.1	7.2	7.3	5.7	5.8	6.9	7.3
Indonesia	6.9	6.2	5.3	6.9	1.7	4.6	5.6	5.8	5.0	5.8	4.3	5.1	5.4
Korea	10.5	7.5	10.1	8.5	5.8	5.7	3.6	3.7	2.9	8.8	7.1	4.7	3.3
Malaysia	7.2	6.9	4.9	9.3	5.2	5.5	4.1	5.8	5.0	5.9	7.2	4.8	5.4
Philippines	6.2	1.3	2.7	1.9	3.6	4.5	4.4	6.2	6.5	2.0	2.8	4.5	6.4
Pakistan	5.0	7.3	6.4	4.5	3.4	4.3	4.6	3.4	5.3	6.9	4.0	4.5	4.4
Thailand	8.0	5.6	9.0	8.8	1.6	5.5	3.1	3.9	3.4	7.3	5.2	4.3	3.6
Singapore	7.5	9.0	6.5	9.3	5.3	5.2	5.3	6.9	2.8	7.8	7.3	5.3	4.8
Turkey	4.4	3.5	4.7	3.6	4.4	4.5	3.5	7.6	5.6	4.1	4.0	4.0	6.6
Egypt	9.6	7.4	4.4	3.6	5.1	3.7	6.1	2.8	4.3	5.9	4.3	4.9	3.6
Israel	3.1	3.6	3.7	6.5	7.7	2.7	3.9	3.9	3.5	3.7	7.1	3.3	3.7
Morocco	6.3	3.7	5.9	3.7	2.7	4.6	4.9	3.9	3.3	4.8	3.2	4.8	3.6
Tunisia	6.3	4.6	2.5	5.0	5.2	4.2	4.5	2.3	1.4	3.6	5.1	4.3	1.8
South Africa	2.1	3.0	1.5	0.2	2.6	3.6	3.6	2.6	1.1	2.2	1.4	3.6	1.8
Nigeria	2.2	-3.4	0.6	3.1	2.1	11.5	6.3	5.7	0.6	-1.4	2.6	8.9	3.2

Notes: 1 Countries include Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuardor, Peru, Venezuela, China,
India, Indonesia, Korea, Malaysia, Philippines, Pakistan, Thailand, Singapore, Turkey, Egypt,
Israel, Morocco, Nigeria, South Africa, Tunisia China's savings rate is from 1982; Indonesia from 1981.
Source: World Bank Database