Economic Growth in Cambodia, Vietnam, and Thailand: Has FDI Really Played an Important Role? Empirical Evidences and Policy Implications

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Abstract:

The current paper analyses the effect of Foreign Direct Investment (FDI) on economic growth in Cambodia, Vietnam, and Thailand from 1987 to 2008. Empirical tests were performed under FDI-policy framework of each country. Policy implications are then drawn from both FDI-strategy reviews and empirical evidences. The channels which FDI affects growth were also taken into consideration – basically, FDI's impact on domestic investment and productivity which are widely considered to be main growth drivers. The present paper extended the model proposed by Agosin and Mayer (2000) by including FDI stock representing foreign investment conglomeration and domestic investment price. The work employed not only panel estimation but also time series analysis for country-specific case. Finally, FDI's impact on productivity was confirmed by using not only TFP but also labor productivity which made the results much more reliable.

Although the results from pooled estimation confirmed the importance of FDI-growth effect, it is mainly a long-run phenomenon. FDI stock was positively and significantly found to have stimulated growth, but FDI flow was not. Even when FDI's indispensable effect was proved, its coefficient was much smaller than that of domestic investment, human capital, labour force, and infrastructure. From country-specific context, FDI was found to have crowding-in effect on domestic investment in Vietnam and Thailand, but it appeared to have neutral effect in Cambodia. FDI was empirically found to have positive effect on productivity in all economies too, but in Cambodia, this effect could be capture only by conditioning on human capital and infrastructure while in the other two, FDI-productivity effect can be observed without any interaction with domestic growth fundamentals. Besides, whilst infrastructure and human capital have been the key factors to increase productivity in all economies, import of goods was unique only to Thailand and goods export distinctive to Cambodia and Vietnam.

As policy implications, the study suggested that a combination of guidelines have to work together at the same time. The results confirmed that FDI is indeed growth-stimulator, but its benefits to Host countries cannot be automatically generated neither by laissair-fair policy nor complete liberalization all at once. When forced FDI

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policy cannot be implemented, more attention should be paid to improve domestic growth essentials as they can tackle three emerging problems instantaneously – augmenting absorptive capacity, strengthening international attractiveness on international stage, and burgeoning domestic sectors.

Key words: FDI, Absorptive Capacity, Productivity/Spillover, Conglomeration effect…
JEL Classification: O11, O16, O33, O38, O47, O53

1. Introduction

Foreign Direct Investment (FDI) benefits growth in recipient country via different channels. For the Host; FDI, which is usually (but not always) made by Multinational Corporations (MNCs), is highly prized because it is widely believed as a source of employment opportunities, a mean to international market access, a contributor to capital accumulation, and a stimulator of domestic productivity. Moreover, it is thought of the injector of new ideas, the regular maintainer of technology upgrade, management technique and quality control. Moran, Edward, and Blomstrom (2005) add that FDI can contribute to changing the so-called "*Production Possibility Frontier*" which they believed to be "*the Development Trajectory*", especially in developing countries. The relationship between accumulations of capital, the introduction of cutting-edge technology embedded in and brought along by MNCs and the change of Production Possibility Frontier matters the most for future growth of all developing economies where domestic innovative activities are very scare and costly. Some other advantages of FDI include, but not confine to, the effect on local market structure and competitions, on foreign-exchange gap, and on the linkage and spillover effect they create with domestic firms in the whole economy. FDI's competition, demonstration, and conglomeration effect are widely thought to scale up productivity, technology spillovers, and domestic as well as other foreign investment activities.

Although piles of literatures have already been available, the impact on growth of FDI is far from simple and conclusive, however. On the one hand, the concerns come from the characteristics and nature of FDI and MNCs themselves. FDI's effect on growth depends very much on whether it is resource-seeking, market-seeking, or efficiency-seeking. Domestic investors might be crowded out due to higher wage foreign firms pay, the easier conditions of credit they can access in domestic financial market, the share of domestic market they take away from local counterpart, and the superior technology they employ which may cause domestic firms to bankrupt due to inability to compete. There have also been plenty of evidences - qualitative and quantitative – showing that the presence of foreign firms does not necessarily lead to increase job opportunities because they use labor saving technology and employ mainly relatively well-educated workers by paying higher wage, causing an increase in wage inequality. FDI in many poor countries causes balance of payment deficit due to e.g., huge import activity they engage in, large repatriation of profit to parent companies, and a huge lose on national revenue due to too-long tax holiday and exemption or inappropriate report of real business profit. Some policymakers also voice their concern regarding the impact on environment. These are just some examples to mention.

On the other, FDI policy and conditions of domestic (growth) fundamentals of recipient country play no less important role in determining FDI-growth effect. Recent literatures find that FDI's impact on economic growth strongly conditions on the stock of human capital and infrastructure, domestic development level of financial market, degree of openness to outside world, macroeconomic stabilities, and institutional capacities. Wise, effective, and flexible FDI policy can certainly help the Host to maximize benefits from FDI which is otherwise nothing but pollution and increased foreign powers. From this, we can safely reach to a very general conclusion that least developed countries must not yet have been able to exploit full potentials from FDI because they are badly in shortage of human resource, infrastructure, qualified financial market, and effectual institutions.

The nucleus of the present paper is, therefore, to contribute to the open-to-doubt FDI-growth literatures by paying attention to the relationship between FDI and growth itself in general and FDI's impact on domestic investment and productivity in particular. Both are widely argued as the most critical factors for sustaining growth in both short and long run. Rather than using purely cross-country estimation or one-country time series analysis, this paper selects Cambodia, Vietnam, and Thailand as examples. These economies locate very close to each other in one of the fastest growing regions of the world. They are the members of ASEAN and share almost similar weather condition. Thailand and Cambodia share basically similar culture whereas Cambodia and Vietnam used to be French colonials. Additionally, Cambodia and Vietnam used to be the so-called "close economy" while Thailand had followed "inward-looking development" strategy from 1960s to mid-1980s. On the contrary, it is worth pointing out that these economies are also dissimilar in various ways such as the size of population, economic multitude, leadership style, and domestic development conditions. Although not all of these factors will be taken into consideration in analytical parts, they do imply that it is not irrational to compare and contrast growth aspects in the three economies.

Also, the three economies are chosen due to several other reasons. First, whereas Thailand has long been considered as one of the emerging and newly industrialized countries whose economic growth was deemed "miraculous" by the World Bank in 1993, Vietnam and Cambodia have been grouped, at least until recently, as two of the low income countries in the region as well as in world. Yet, particular notice is that Vietnam has experienced unprecedented economic growth performance, and by 2009 she has already graduated from the group of low-income countries whilst Cambodia remains as poor and least developed.

Second, these economies have registered high and relatively stable growth rate in the last two or three decades, particularly after comprehensive reforms. Table 1 lists simple averaged GDP growth rate during 1980s, 1990s and 2000s for some 40 Asian economies, and it shows that both Vietnam and Cambodia has maintained average growth rate around 6.5% during 1980-2009. For Cambodia, output growth has gradually increased from decade to decade; for Vietnam, growth has been high and stable at around 7.4% since comprehensive reform in 1986. Although Thailand's high growth

period was observed mainly in 1970s, 1980s, and early 1990s, her 3-decade average of advancement is still as high as 5.5%. In term of per capita GDP growth rate, however, Vietnam and Thailand recorded 4.1% over 1980-2009 periods while Cambodia performed less impressively (3.5%) due to high population growth during 1980s and 1990s.

Table 1: GDP Growth Rate in Asia - 1980 - 2009

	1980s	1990s	2000s	1980-2009
China	9.750	9.990	10.280	10.007
Maldives	11.974	8.656	5.663	8.764
Bhutan	9.341	5.284	8.543	7.723
Singapore	7.541	7.552	5.586	6.893
Vietnam	4.862	7.419	7.265	6.515
Cambodia	4.951	6.336	8.139	6.476
Oman	9.832	4.087	5.361	6.463
Myanmar	1.935	6.120	11.106	6.387
Lao PDR	6.007	6.274	6.691	6.324
Qatar	8.276	4.927	5.636	6.302
India	5.688	5.626	7.081	6.132
Korea, Republic	7.679	6.254	4.377	6.103
Malaysia	5.875	7.248	4.800	5.974
Taiwan	8.172	6.199	3.421	5.931
Thailand	7.295	5.275	4.062	5.544
Indonesia	6.378	4.835	5.097	5.436
Hong Kong	7.428	3.581	4.957	5.335
Pakistan	6.865	3.976	4.644	5.161
Sri Lanka	4.145	5.260	5.000	4.802
Lebanon	-0.200	9.676	4.680	4.719
Bangladesh	3.217	4.801	5.810	4.609
Bahrain	1.411	5.520	6.344	4.464
Nepal	4.094	4.845	3.995	4.311
Syria	2.836	5.658	4.237	4.243
UAE	1.227	5.579	5.828	4.211
Mongolia	6.276	-0.256	5.917	3.979
Turkey	4.101	3.978	3.780	3.953
Vanuatu	2.470	4.023	3.575	3.356
Australia	3.378	3.284	3.176	3.279
Iran	-0.307	4.642	5.097	3.144
Philippines	2.012	2.783	4.562	3.119
Papua New Guinea	1.360	4.313	2.669	2.781
Solomon Islands	1.591	4.828	1.452	2.624
New Zealand	2.100	2.667	2.696	2.480
Japan	4.368	1.464	0.737	2.190
Tonga	2.302	2.375	1.397	2.024
Saudi Arabia	-0.612	3.102	3.367	1.952
Fiji	0.810	3.163	0.870	1.614
Samoa	-0.224	1.395	3.610	1.594
Kuwait	-0.801	-1.500	6.762	1.487
Brunei Darussalam	-2.394	2.082	2.285	0.542
Lower middle income	6.027	6.084	7.907	6.672
High income: nonOECD	3.900	4.515	4.900	4.422
High income: OECD	3.075	2.520	1.625	2.407
Upper middle income	2.064	1.740	3.683	2.495
Low income	2.649	2.747	5.118	3.505
World	3.138	2.739	2.572	2.816

Sources: World Development Indicator, UN Statistical Database and the Conference Board of Total Economy Database, September 2010

Coupled with high growth period, the role of foreign capital has increasingly become much more important than ever before. FDI, one of the forms of foreign capital inflow, has also dramatically surged. Although FDI inflow in real amount is much smaller in Cambodia than in Thailand or Vietnam, FDI proportional to GDP and gross

fixed capital formation is the highest in Cambodia due to her low saving and investment rate. On average, 45% of accumulated FDI stock is in industrial sector and more than 50% other in service sector. In fact, according to most previous researchers and available statistics, FDI is argued to have played a very significant role in the development of these countries. In Cambodia, FDI's impact on job creations, export, and capital accumulation has been often cited at the key channels to boost growth. In Vietnam, examining FDI statistics recorded by General Statistical Offices shows that it plays a very indispensable role in industrialization process, creates more job opportunities for new entrants into labor market, boosts export with the help to lessen trade deficit problem by importing much less that domestic sectors, contributes a significant proportion to state budget, and is more active in R&D activities then state-owned and domestic enterprises.[2] In Thailand, the most manifest contribution from FDI to growth can be observed via industrialization process (FDI contributes to structural changes), linkage to domestic sectors, and trade engagement. In addition, FDI is said to be the only kind of capital flow which was less footloose during 1997-1998 Asian financial crisis.

Third, policymakers in the three countries have put great effort to attract FDI as one of their development policies believing that the benefits it brings into their economy outweighs the cost. Their foreign investment regime has come across many modifications and recently, most of the impediments to foreign business activities have been gradually but surely removed. Meanwhile, the competition to grant foreign investors different kind of incentives has already been in place and tense. As yet, not many authors have warily devoted to clarify whether or not FDI has promoted growth by using comparative studies. Moreover, FDI's effect on aggregated productivity and domestic capital formation has been, at best, ignored. Accordingly, the current paper can contribute some new fresh evidences to FDI-growth literatures and shed light on the future FDI strategy for these economies by going more deeply insight into policy assessment and channels though which FDI affect growth.

2. Objectives, Uniqueness, and Structures of the Paper

The current paper compares and contrasts FDI's effect on economic growth of Cambodia, Vietnam, and Thailand mainly from 1987 to 2008 (although in some cases, time span might be longer or shorter depending on data availability). The main objective of this paper is twofold. First, it aims at examining the effect of FDI on each country's GDP and its growth. The evaluation of FDI-growth effect is then done via 3 channels. The study links FDI's growth effect to the historical development of FDI policy in the three economies in the last 3 decades. Moreover, this piece of work takes great care of FDI's effect by using both FDI stock and FDI flow (stock-stock relation and flow-flow relation). Third, the current research not only empirically tests the effect of FDI on growth itself, but also investigates FDI's effect on two key growth determinants – domestic investment and total factor productivity – which significantly

[2] The detail of this analysis is available in chapter 5 of my dissertation. The analysis is based on data provided by GSO, Vietnam.

distinguishes this study from previous ones. The second objective is to prescribe policy recommendations to the policymakers in these as well as other developing countries, arguing for and against the widespread belief that FDI is a strategic mean to promote economic development.

The present paper is inimitable in a few important points. First, it deals with FDI policy in detail, proves the prized role of FDI by statistical evidences, and suggests some other policies drawn from those verifications. Second, it touches upon two sources of short-term and long-term growth – domestic investment (which later affects capital stock accumulation) and productivity (which affects the competitiveness and the production frontier). Third, this study follows widely-accepted long-run growth theory by using stock value of FDI and by including many variables which have been found to be influential to explain growth. In addition, it also takes into account the FDI-growth effect in the short run by using FDI flow against the growth of GDP per capita. Fourth, the paper employs both pooling estimation method and time-series analyses to corroborate the role of FDI. Therefore, the outcomes are more realistic than those from a single country case or from pooling all countries around the world together.

The remaining of this paper is structured into 4 parts. Part 3 recapitulates, compares, and contrasts FDI policy (FDI-regime) of Cambodia, Vietnam, and Thailand. Due to space limitation, this part is not incorporated into this work. A separate sheet detailing FDI regime in these economies is given in addition to this paper. Part 4 briefs with dataset usage and its limitation, model as well methodology specifications. Part 5 and 6 presents empirical results, analyses, discussion, and policy implication respectively.

3. Methodology and Data Sources

The analytical section consists of 4 steps. First, the current paper aims at estimating annual total factor productivity growth by using growth accounting framework. The standpoint of this paper is supply side in which supplying capacity is a key to economic prosperity. From the original growth accounting, first we differentiate both sides of Y = Af(K,L) with respect to time and divide by Y. Let Δ denotes the rate of change of the 4 terms and replace marginal productivity by factor prices yields the following equation:

$$\Delta Y_t = \Delta TFP_t + \alpha \Delta K_t + \beta \Delta L_t \quad (1)$$

Y is GDP, TFP stands for total factor productivity which is assumed to be Hick-neutral in nature, K is capital stock, and L is employed population. α and β represents national income share accrued to capital and labor respectively. By assuming that the growth rate terms of equation 1 are instantaneous rate of change, for the discrete time, we can write equation 1 as:

$$\Delta TFP_t = (\mathrm{Ln}Y_t - \mathrm{Ln}Y_{t-1}) - (1/2\ (\alpha_t + \alpha_{t-1})\ (\mathrm{Ln}K_t - \mathrm{Ln}K_{t-1})) - (1/2\ (\beta_t + \beta_{t-1})\ (\mathrm{Ln}L_t - \mathrm{Ln}L_{t-1})) \quad (2)$$

In particular, equation 2 is trans-log growth accounting under an assumption that factors are paid their marginal product under competitive equilibrium condition and a constant return to scale. Equation 2 will be used to calculate TFP growth in the three countries.

The next task is to estimate capital stock and income share accrued to labor and capital. Although capital stock series for Thailand is readily available from the National Economic and Social Development Board (NESDB), in this study we attempt to construct capital stock data by using a unified method for all economies. Perpetual Inventory Method (PIM) which is defined as $K_t = K_{t-1} * (1-d) + I_t$ is used. In this method, K is capital stock, d is depreciation rate, and I is investment. Depreciation rate is derived from national account for each country and it is set to 0.05 for Cambodia, 0.06 for Vietnam, and 0.07 for Thailand. [3] Initial capital stock is approximated back in 1980 by using technique suggested by Hall and Jones (1999) and UNIDO (2009). It is defined as: $K_{1980} = I_{1980} \div (g_{1970\text{-}1979}+d)$ in which g is averaged growth rate of investment a decade prior to 1980. However, as investment data for Vietnam and Cambodia during 1970s is not reliable, we replace g_{1970s} by average growth rate of investment during 1980s instead. For a reasonable comparison purpose, all data are based on 1990 US Dollar and are derived from UN Statistical Homepage.[4]

Labor and capital income share is also derived from National Account of each country. For Thailand, this series is readily available from 1980 onward. For Vietnam, data provided is available from 1989 to 2005. Therefore, factor income share prior to 1989 and post 2005 is extrapolated by the author based in TFP estimation given in APO's report (2004). For Cambodia, data obtainability is only during 1993-2006; the rest is estimated by the author by applying 3-year-forward- and 3-year-backward-moving-average method. It is worth remarking that labor income share is adjusted for the revenue of self-employed population whose share accounts for almost half of total employed population in Cambodia and Vietnam and as much as 30% in Thailand. The detail of how it is adjusted is given in chapter 4 of my dissertation. The current paper uses employed population as a proxy for L rather than labor force or economically active population as it echoes more truly the real situation than the other two. This data is taken mainly for official homepage of each economy with comparison to and complement from information provided by the Conference Board of Total Economy.

[3] Depreciation rate derived from Thai national account ranks from 0.06 to 0.12 from 1980 to 2008. However, after thoroughly checking with other growth study, it is set to 0.07 throughout estimation period. The detail is available in chapter 4 of my dissertation.

[4] We thoroughly compare UN's data with those provided in World Development Indicators organized by the World Bank as well as Key Indicator Series given by Asian Development Bank. We found only a small difference in the figure. It is worth noting data prior to 1990 for Cambodia and 1985 for Vietnam is not necessarily reliable as they are mainly estimated by UN staffs.

Second, the paper moves on to empirically testing the effect of FDI on growth by applying the following equation:

$$Y_{i,t} = \alpha + \beta_1 INFLA_{i,t} + \beta_2 GOV_{i,t} + \beta_3 CAP_{i,t} + \beta_4 LAB_{i,t} + \beta_5 FDI_{i,t} + \beta_6 HUMCAP_{i,t} + \beta_7 OPEN_{i,t} + \beta_8 INFRA_{i,t} + \beta_9 CREDIT_{i,t} + \beta_{10} DUMMY + \mu_{i,t} \quad (3)$$

This model bases on aggregate production function, and is extended to include FDI as one of production factors, and some other growth fundamentals which have found to give significant impact on growth. In equation 3, β_1 captures the effect inflation representing macroeconomic variable, β_2 captures the effect of government size. Both are expected to show negative sign as inflation and big government retards growth. β_6 seizes the effect of human capital. Here, we use two variables to symbolize human capital – secondary students and the number of population aged 15 and over multiplied by its mean year of schooling. The latter represents the available stock of human resource which is widely believed to promote growth in the short and long run. Therefore, we expect human capital variables to show positive sign. β_7 detents the impact of trade openness which is also expected to have positive coefficient. β_8 captures the impact on infrastructure. We divide infrastructure variable into 2 – (fixed) telephone mainline in use alternative for telecommunication infrastructure and railways proxy for transportation infrastructure. We hypothesized that both would positively give impact on growth and the data are taken from WDI and ITU. Missing data is extrapolated or interpolated from surrounding information. β_9 seizures the effect of credit to private sector, demonstrating the level of financial development. β_3, β_4, and β_5 capture the effect of capital stock, labor force, and FDI respectively – all are expected to produce positive sign.

β_{10} captures other controlling variables which affect growth. In this study, it consists of 2 dummy variables – first is Asian financial crisis dummy and second is post-WTO entrance dummy. The latter dummy is valued at 1 from 1995 onward for Thailand, from 2004 for Cambodia, and from 2007 for Vietnam. The inclusion of this dummy enables equation 3 to capture the effect of comprehensive policy change toward trade and investment practices. It is expected that both dummy will show negative and positive sign respectively. Crisis dummy is valued at 1 in only 1997 and 1998 for all economies.

Equation 3 will be estimated twice – one by using stock-stock technique and another one by using flow-flow relation. By stock-stock technique it means that we particularly pay attention to the impact of FDI stock on the size of GDP. And by flow-flow relation it means that we test the effect of FDI inflow (as % of GDP) on per capita growth rate. The second method is widely used for pooled data in the short run while the first is relatively a long-run estimation. In both models, other variables are transformed accordingly.

Third, the work proceeds to test the impact of FDI on domestic investment following the model suggested by Agosin and Mayer (2000). However, we extend the model by adding 3 more important variables – FDI stock, domestic investment price,

and post-WTO entrance dummy. FDI stock is included to take care of another effect called "conglomeration effect"; it may or may not significantly affect the speed of domestic investment depending on the geographical location and size of foreign investment conglomeration itself as well as the Host government policy. But a few previous works show that agglomeration effect of FDI plays a very important role in congregating domestic investors due to imitating and supplying effect. Price of investment is considered the affect domestic investment decision significantly because the increase of price for investment might reduce investment scale due to the shrinking expected profit. Therefore, we expect investment price to negatively relate with investment rate. Post-WTO entrance enters regression so that we can capture investment-related reforms on the rate of investment itself. It is worth mentioning again that all economies modified many laws and policies to create an equal investment environment for both domestic and foreign investors. We leave its expected coefficient hypothesized. The equation can be written as:

$$INV_{i,t}/GDP_{i,t} = \alpha + \beta_1 FDI_{i,t}/GDP_{i,t} + \beta_2 FDI_{i,t-1}/GDP_{i,t-1} + \beta_3 FDI_{i,t-2}/GDP_{i,t-2} + \beta_4 INV_{i,t-1}/GDP_{i,t-1} + \beta_5 INV_{i,t-2}/GDP_{i,t-2} + \beta_6 GDPGR_{i,t-1} + \beta_7 GDPGR_{i,t-2} + \beta_8 FDISTO_{i,t-1}/GDP_{i,t-1} + \beta_9 INVPRI_{i,t-1} + \beta_{10} WTODU_i + \varepsilon_t \quad (4)$$

FDI is included as FDI inflow. Previous year's growth rate is incorporated in our model because it is believed that the higher the last year growth rate, the higher the investment in the current year. Equation 4 enables us to make out the impact of FDI on total investment. And as suggested by the authors above, this equation reveals if FDI crowds in or crowds out domestic investment. If FDI crowds in local investors, FDI is said to be more beneficial to growth and if it crowds out, the government needs to reassess the policies and reevaluate the framework in which FDI and domestic investment is working. It is always found out that the initiated effect of FDI is negative on domestic firms because it reduces market share of domestic investors.

To evaluate if our assumption is correct or not, we have to look at 1) the 3 years' coefficient of FDI on total investment, and 2) β_{LT}' coefficient. β_{LT} is a sum of 3 years' FDI over the sum of 2 years' total domestic investment, taking the form: $\beta LT = \sum_{j=1}^{3} \beta j / 1 - \sum_{j=4}^{5} \beta j$. The criteria used to determine the CO/CI effect is the value and significance of coefficient β_{LT}. There are three possibilities:

- With a Wald test it is *not possible* to reject the hypothesis that $\beta_{LT} = 1$. This means that FDI has neutral effect on total investment in the long run ($\Delta FDI = \Delta INV$),
- If the null hypothesis $\beta_{LT} = 1$ *is rejected* and $\beta_{LT} > 1$, it is the evidence of CI: in the long run, the increase of FDI is smaller than the increase of total investment ($\Delta FDI < \Delta INV$)
- If the null $\beta_{LT} = 1$ *is rejected* and $\beta_{LT} < 1$, there is long-run CO: an additional percentage increase of FDI leads to less than a percentage increase in total investment ($\Delta FDI > \Delta INV$)

Finally, the impact of FDI on TFP is analyzed. Besides FDI, there are many factors which give impact on productivity such as competitiveness pattern, R&D investment, trade, human capital, infrastructure, availability of researchers and scientists, ITC

exports and imports, and well-functioning financial system…etc. However, due to unavailability of data, this study primarily estimates the following equation:

A = f (FDI, Trade, Human Capital, Infrastructure, Private Credit, Crisis Dummy) (5)

FDI is separated into FDI_t, FDI_{t-1}, and $FDISTOCK_{t-1}$. In equation 5, FDI enters as percentage of gross fixed capital formation. Trade is also separated into trade openness ((export+import)/GDP), export of goods and import of goods. Human capital is represented by secondary schooling (entered as one year lag) and the stock of population aged 15 and over with average mean years of schooling. Infrastructure is fixed telephone mainline in use.

We use fixed effect estimation method to estimate equation 3, 4, and 5 as this method can take good care of other unobservable country-specific effect as all included variables are just some of the factors which affect economic growth. Consider the following:

$$Y_{i,t} = \alpha_1 + \alpha_2 D_{2,VIETNAM} + \alpha_3 D_{3,THAILAND} + \beta X_{i,t} + u_{i,t} \qquad (6)$$

X is ancillary vector of independent variables collected in equations above. α_2 and α_3 captures the effect of other excluded variables specific to Vietnam and Thailand. D_2 = 1 if the observation belongs to Vietnam and 0 otherwise; D_3 = 1 if the variable belongs to Thailand and 0 otherwise. To avoid dummy trap, only 2 dummies can be included as we have only 3 countries under consideration. But α_1 itself already capture special features of Cambodia. We also use Likelihood Ratio to test for the redundant fixed effects. In addition to panel estimation, this study employs OLS to test for FDI's effect on time series for all countries. It is worth noting that some variables are dropped in time series analysis because of small degree of freedom. In addition, estimating period for country-specific case may be shorter or longer than 1987-2008 depending on data availability. More explanation is given under each analytical table or figure.

Data used in this study are collected from both national and international organizations. FDI statistics (stock and flow) are taken from UNCTAD and they are gross amount.[5] FDI stock is deflated by investment deflator based on 1990 price for all country. National account data is derived from UN statistical database; all are in constant 1990 US$.[6] Secondary education figures are taken from official homepage of World Development Indicators, United Nation Development Program, and national statistical agency's sites. Infrastructure information is taken from WDI as well as International Telecommunication Union (ITU). Private credit data is mainly derived from WDI, compared with and supplemented by ADB's Key Indicators, and deflated by 1990 GDP deflator. Employed population is taken from official data provided by each statistical offices; missing data is appended by those from the Conference Board of

[5] As for Cambodia, FDI statistics from 1987 to 1992 is taken from ADB's Key Indicators Series 2000 under "Direct Investment". Please following the following links http://www.adb.org/Documents/Books/Key_Indicators/2000/default.asp?p=statpub

[6] See http://data.un.org/Browse.aspx?d=SNAAMA for detail

Total Economy Database. Working –age population by age group is derived from ILO, given in UN Statistical Homepage. Export and import of goods are calculated by the author based on WTO's trade statistics by subtracting export and import of service from their total amount. Inflation figures are quoted from IMF's economic outlook database. Labor share is estimated by the author using Vietnam's unpublished national account, Thailand's national account provided by NESBD, and Cambodia's national account provided in Statistical Yearbook 2006.[7] Adjustment for the income of self-employed population is based on labor force surveys of each economy.

4. Empirical Results and Analyses

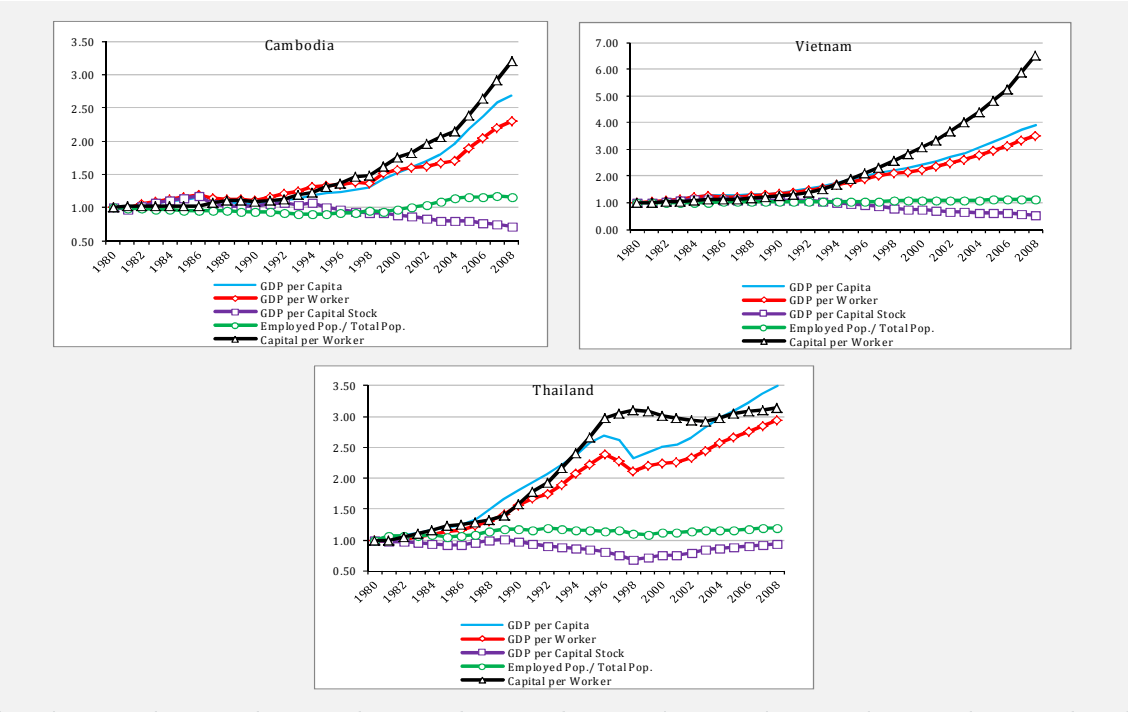
4.1. Growth Accounting, 1981-2008

Figure 1 summarizes some important growth mainstays of the 3 economies from 1980 to 2008 by normalizing their number in 1980 to 1. Basically, it shows how productivity has developed. We are not going into detail due to space limitation, but a few noticeable features can be observed. First, capital per worker in Vietnam and Cambodia is now increasing at highest speed since mid-1990s. Second, GDP per worker for both countries has also been growing although the speed is much higher for Vietnam. Third, output per capital stock for Cambodia and Vietnam has downwardly trended since mid-1990s while that of Thailand has seen improvement since 1998, suggesting that growth after the crisis is resulted from both capital and labor productivity. Capital stock per worker in this country fails to show further increasing trend since 1998, suggesting that contribution from capital in the post-crisis period might not be as large as that of productivity. Finally, it seems that economic growth affects labor participation rate differently. In Thailand, growth during 1980s and 2000s could accommodate new entrants into labor market. In Vietnam, labor force participation rate (proportional to total population) has (very) slowly but gradually increased. In Cambodia, however, economic growth had clearly failed to provide new jobs to new entrants into labor market at least until 2000.

The results of trans-log growth accounting depicted in table 2 disclose that high economic growth rate for all economies have been stemmed mainly from capital stock. In Vietnam, it contributes more than 57% to average GDP growth during 1987-2008 periods. In Cambodia and Thailand, physical capital stock contributes slightly more than 50%. TFP's contribution to growth is the highest in Thailand, accounting for 35% out of 5.7 percent of annual economic growth from 1985 to 2008. In Vietnam, growth stemmed from TFP is estimated to be around 26% (1.8% out of 7.1 percent), while productivity intensification in Cambodia is the lowest, contributing roughly 20% to the averaged output growth rate of 7.3 percent since 1989. It is worth noticing that growth contribution from labor input is the highest in Cambodia and lowest in Thailand, reflecting clearly the level of development of each country.

[7] Data for compensation to employees of Cambodia in later period is taken from World Development Indicators but mixed income and operating surplus statistics from 2006 to 2008 is calculated by the author using forward 3-year-moving average.

Figure 1: Some Key Features of Cambodia, Vietnam, and Thailand's Economic Growth



Source: Author's Compilation. Capital stock is estimated by the author. Data are normalized to 1980 = 1

Compared to growth accounting estimation of other studies, TFP growth in Vietnam appears to be less impressive in our studies due to the effect and speed of capital accumulation. Goldman and Sachs (2008), Anh (2007), and APO (2004) found that TFP improvement in Vietnam is more than 2.7% while the Conference Board to Total Economy (2010) and Baier et al. (2005) estimated it to be negative. The latter estimation might not be plausible due to the fact that Vietnam's economy has grown very rapidly and capital stock and labor force alone cannot account for more than the real growth rate itself. The former TFP calculation is very high by developing country standard, resulting partly from relatively high initial capital stock estimation and partly from the different used dataset of employed population. Thailand's TFP growth found in this paper is basically similar to those from other studies such as Bosworth (1995) and Tinakorn (1994). As for Cambodia, there is no recognized existing study aiming at estimating TFP growth yet. In APO report (2009), it is found that productivity improvement in this small economy is exceptionally low and negligible. However, after adjusting for labor income share, growth contribution other than production inputs accounts for a sizeable proportion.

Table 2: Growth Accounting of Cambodia, Vietnam, and Thailand – 1981-2008

Cambodia

Periods	Labor	Capital	TFP	GDP
1981-1985	1.63	1.45	3.14	6.22
1986-1990	1.73	1.93	-1.56	2.11
1991-1995	1.47	2.75	2.24	6.46
1996-2000	2.01	4.24	0.93	7.18
2001-2005	2.91	4.87	1.59	9.36
2006-2008	1.13	5.54	2.33	9.00
1989-2008	**1.93**	**3.88**	**1.48**	**7.29**

Cambodia

Labor	Capital	TFP	GDP
26.23	23.33	50.44	100.00
82.14	91.58	-73.72	100.00
22.74	42.57	34.69	100.00
27.94	59.10	12.96	100.00
31.06	51.97	16.98	100.00
12.56	61.53	25.91	100.00
26.43	**53.19**	**20.38**	**100.00**

Vietnam

Periods	Labor	Capital	TFP	GDP
1981-1985	1.65	1.54	3.58	6.77
1986-1990	1.56	1.79	1.19	4.54
1991-1995	1.37	4.31	2.52	8.19
1996-2000	1.19	5.24	0.54	6.96
2001-2005	1.08	4.05	2.38	7.51
2005-2008	0.96	4.87	1.84	7.67
1987-2008	**1.16**	**4.09**	**1.83**	**7.08**

Vietnam

Labor	Capital	TFP	GDP
24.35	22.72	52.93	100.00
34.30	39.46	26.24	100.00
16.68	52.55	30.77	100.00
17.08	75.22	7.70	100.00
14.36	53.96	31.68	100.00
12.49	63.50	24.02	100.00
16.37	**57.74**	**25.89**	**100.00**

Thailand

Periods	Labor	Capital	TFP	GDP
1981-1985	1.44	3.44	0.43	5.30
1986-1990	1.83	3.52	4.46	9.81
1991-1995	0.53	5.96	1.79	8.27
1996-2000	0.16	2.34	-2.05	0.45
2001-2005	0.96	0.46	3.55	4.97
2005-2008	0.87	1.38	2.60	4.86

Thailand

Labor	Capital	TFP	GDP
27.08	64.81	8.11	100.00
18.64	35.89	45.47	100.00
6.39	71.98	21.63	100.00
34.73	521.65	-456.38	100.00
19.39	9.31	71.30	100.00
17.97	28.43	53.60	100.00

Source: Author's Calculation as mentioned in the main text.

Table 2 also reveals that, after the crisis period, technological improvement contribution to growth in Thailand outpaces that of capital stock, paralleling the conclusion from figure 1. This phenomenon happens just after the policy shift toward innovation-based strategy in 1999 and 2003 as mentioned FDI-policy section. Nonetheless, in Cambodia, physical capital stock's contribution to growth is gaining momentous while in Vietnam, growth stemmed from labor force is now waning though capital stock's role is still imperative.

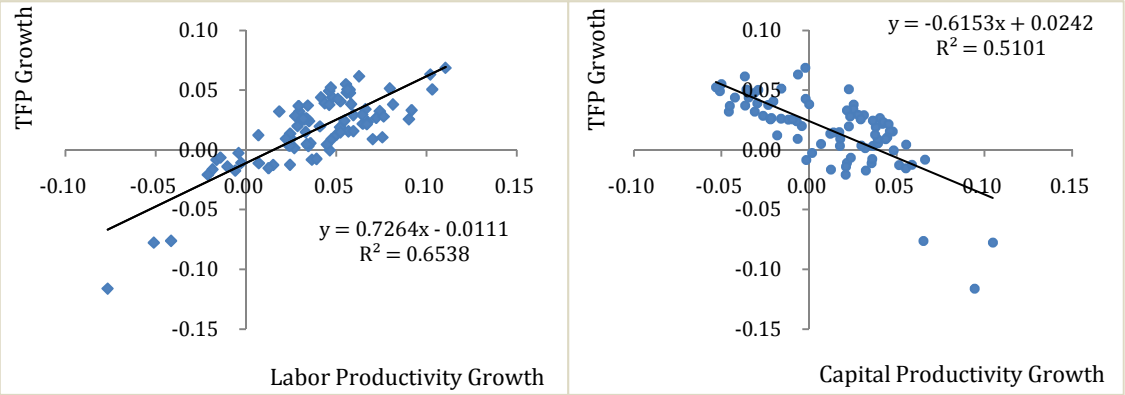
4.2. TFP: Labor Productivity or Capital Productivity ?

As mentioned earlier, TFP in this paper is assumed to be Hicks-neutral, meaning that the change in technology does not shift the ratio of capital's marginal product to labor's marginal product in the production function framework. However, technology can also be labor-augmenting (Harrod-neutral) or capital-augmenting (Solow-neutral). In developing countries, however, capital productivity is not the key factor highlighting TFP growth. In addition, capital productivity growth is susceptible to many problems regarding the construction of capital stock itself. Therefore, in this work, in order to obtain a less biased results regarding FDI's effect on productivity, we also confirm the findings in empirical analysis by using both TFP and labor productivity growth.

As shown in figure 2, labor productivity has a very close and positive relationship with TFP (+0.73 with R^2 more than 50%) while capital productivity (measured by annual change of output-capital ratio) has worsened during the whole period. The exception is only for Thailand after 1998 when this started to advance considerably.

There are a few reasons explaining why capital productivity might not be the main cause for TFP growth. First, indigenous or foreign-introduced technology itself in the three economies is far from capital-augmenting as most of the capital stock is in the form of buildings rather than equipment or machines. Second, capital relates not only with physical but also financial capital (Agrawal et al. 1996), suggesting that even though capital accumulates at high speed, the income it generates play a far more important role. Additionally, productivity of capital depends strongly on real interest rate which is reflected via high level of domestic financial development.

Figure 2: Graphical Relationship between TFP-Capital Productivity and



TFP-Labor Productivity

Notes: The graph is based on 1981-2008 periods. Capital productivity is the growth rate of GDP per capital stock (positive sign denotes improvement in productivity). Labor productivity is defined as the growth rate of GDP per employed population. All are in constant 1990 price. **Source:** Graphed by the Author as mentioned in the main text.

4.3. The Effect of FDI on Growth: A Long-term Phenomenon

Table 3 reports the results obtained by using equation 3. It is tabulated into 2 sub panels – the first one illustrates the outcomes when stock value of FDI is used while the second panel shows the results using FDI inflow value. Particular attention should be paid to the change of variables – with GDP and FDI stock, logarithm is applied. Variables in the parenthesis represent how they are converted when GDP per capita growth rate and FDI inflow as percentage of GDP is used. It is worth noting that railway (route per Km) is excluded in panel 2 as its real value does not change much over time.[8]

The results in both panels are different in some points and similar in others. Physical and human capital has its sign as expected in all equations while crisis dummy obviously has a very precarious effect on growth. The point estimation implies that a

[8] Although we use its annual growth rate, the figure is zero almost every year. If we convert it by dividing by total surface area, the figure is very small to show any effect on growth, if any.

one-percent increase in capital stock stimulates GDP by 0.35% while a one-percent rise in investment ratio boosts growth by around 0.19%. Therefore, a one standard-deviation increase of investment rate (9.0 from 1987 to 2008) has promoted per capita GDP growth in Cambodia, Vietnam, and Thailand by around 1.7%. Human capital is another factor whose coefficient is found to be positive and statistically significant in all equations in panel 1 and 2. Evidently, its effect in the long run is larger than it is in the short run, suggesting that investing in human is a fundamental to sustainable growth. The coefficient in the second panel indicates that a one-percent increase in human capital raises growth by 0.07%. The standard deviation of this variable from 1987 to 2008 is around 3.3, suggesting that its real effect on growth of per capita GDP is 0.23%. It is worth noting that secondary education is positive and statistically confirmed only in the first panel, suggesting that there is time intermission for students in secondary schools before they can participate in labor market and contributes to economic growth. A one-percent increase in students attending secondary schooling upholds growth by 0.12% in the long run.

Three other variables which are found to significantly affect only long-term economic growth are inflation, government size, and infrastructure availability. Clearly, both inflation represented by annual change of CPI and government size mirrored through its consumption retards growth noticeably. It is estimated that per capita growth rate in the three economies would have been 0.065% higher had their government consumed one percent lower than the real amount it consumed from1987 to 2008. The point estimation conveys that a one standard-deviation increase in government consumption (1.6) and inflation (70.2)[9] have reduced growth on impact by 0.10% and 1.0% respectively. In the long run, however, the effect of both factors is unnoticeable although the size of government turns negative when more and more variables are allowed to enter regression. The reason is that consumption in nature boosts economy only when we disregard other growth fundamentals, implying that government should invest rather than consume and the bigger the role of the state, the more it drives away capital from its most productive use. As for inflation rate, given that government in all countries has been able to keep domestic price level well under control after liberalization period, it is not hard to understand the situation. As many authors have already pointed out (Barro 1995, Sarel 1996, and Li 2006), relatively low and stable inflation (rank somewhere between 8% and 15%) does not have any harmful effect on growth, and in some cases, its effect might be even (slightly) positive.

International trade openness is not found to have any significant effect on output growth. At best, the relationship between openness and growth in still inconclusive, and the results can be interpreted in different ways. On the one hand, it is often argued that trade volume relative to GDP inaccurately represents the whole trade policy of these economies although this ratio has been higher than 130%. It can be that there are some other factors besides trade openness (tariff reduction, for instant) which affect growth positively and significantly. In this case, Harrison (1996) suggests that trade openness

[9] The high standard deviation is due solely to high inflation rate in Cambodia during 1989-1993 and Vietnam during 1987-1992. We try to rerun regression excluding 1987-1992 periods, and the new results do not confirm the significant negative effect of inflation. Therefore, the coefficient of inflation should be interpreted with caution.

itself does not seem to positively relate with growth but the "change" of openness does. On the other, controlling for other growth stimulators, trade openness strongly promotes growth in the short run via consumption welfare effect and (lower) price effect while the ability to fully participate in and capitalize on trade depends solely on domestic production capacity and knowledge about international distribution network. Simply speaking, long-term end product of openness on growth should be reflected via productivity effect, again relying strongly on complementary inputs such as institutions, human resources, and well-developed infrastructure. In the short run, the estimated coefficient implies that 10 percentage increases in trade openness stimulates growth on impact by 0.18 percentage point.

The role of private credit is also unobservable. This should not come as a surprise as largely available credit to unproductive sector is often quoted as one of the causes of Asian financial crisis originating in Thailand. This can also be the result of fragility and underdeveloped of financial sector in these economies. Moreover, it is not simply the increase in size of credit which matters growth; its efficiency and the manageability of credit itself share an equal connotation. In panel 2, private credit affects aggregate income growth positively though its coefficient is not statistically proved. Still it suggests than a one-standard-deviation increase of credit to private sector proportional to GDP (35.3 from 1987 to 2008) has advanced growth on impact by 0.18%. The impact of labor and infrastructure on growth is found only in panel 1. In addition, transportation infrastructure matters growth more than telecommunication system. The estimated coefficient of railway is 0.26, implying that a one-percent increase in rail route boosts growth by 0.26%. However, the data shows that railway system in these economies has not much improved since 1987. A one-percent increase in telephone mainline in use stimulates growth by around 0.02% to 0.03%. Yet, there is no evidences suggesting that more people covered by telephone line are associated with higher per capita growth rate. This is partly because (fixed) telephone is predominantly connected by firms and institutions while individuals use mainly mobile one.

It is worth noting that FDI stock's coefficient is always positive and significant while FDI flow's is mostly not. An exception is only in column 6 in panel 2 when FDI enters with statistically significant coefficient. This happens only when openness and private credit are controlled for, implying that there might be strong correlation these variables. It can be observed from panel 1 that its coefficient is estimated to be around 0.056 which implies that a one percent increase in FDI stock boosts total output by 0.056%. This effect is much smaller than that of labor, domestic investment, human capital, secondary education, and rail transport. In panel 2, its significant coefficient is 0.218, indicating that a 10 percentage point increase in FDI inflow relative to GDP promotes per capita growth by 2.2%. However, given that Cambodia, Vietnam, and Thailand have confronted harder time to call for FDI in proportion to their GDP, the standard deviation of FDI-GDP ratio from 1987 to 2008 is merely 2.9, meaning that its real effect on growth of the three economies is around 0.58% on impact. Again, this contribution is much smaller than that of domestic capital (less than ½).

Table 3: Testing for FDI-Growth Effect in Cambodia, Vietnam, and Thailand – Pooling Estimations

	Using Stock Value (Dependent Variable: Log of GDP)						Using Flow Value (Dependent Variable: GDP per Capita Growth Rate)					
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	**6**
Constant Term	8.699***	3.547**	1.935	3.267**	1.259	1.712	0.056**	0.056**	0.051**	0.041	0.042*	0.019
(Constant Term)	(4.927)	(2.334)	(1.561)	(2.431)	(0.784)	(0.694)	(2.302)	(2.336)	(2.021)	(1.618)	(1.653)	(0.690)
Log(CPI Index)	0.001	0.003	-0.008	0.007	0.013	0.014	-0.017***	-0.014**	-0.012**	-0.015**	-0.025**	-0.016**
(Annual Change of CPI)	(0.032)	(0.255)	(-0.851)	(0.582)	(1.121)	(1.187)	(-3.064)	(-2.280)	(-2.020)	(-2.441)	(-2.411)	(-2.664)
Log(Government Size)	0.704***	0.115**	0.016	-0.019	-0.029	-0.018	-0.087***	-0.071***	-0.069***	-0.067***	-0.065***	-0.057***
(Gov. Consump./GDP)	(7.750)	(2.196)	(0.359)	(-0.439)	(-0.674)	(-0.406)	(-4.075)	(-3.549)	(-3.391)	(-3.418)	(-3.267)	(-2.837)
Log(Capital Stock)		0.542***	0.357***	0.261***	0.358***	0.379***		0.190***	0.189***	0.196***	0.195***	0.206***
(Investment/GDP)		(18.206)	(9.016)	(5.175)	(5.035)	(4.990)		(3.285)	(3.271)	(3.181)	(3.195)	(3.114)
Log(Labor Force)		0.267*	0.641***	0.605***	0.507***	0.455**		0.149	0.173	0.128	0.135	0.189
(Labor Force/ Population)		(1.863)	(4.902)	(4.535)	(3.732)	(2.417)		(1.221)	(1.332)	(1.076)	(1.120)	(1.618)
Log(FDI Stock)			0.084***	0.053***	0.055***	0.059***			0.067	0.139	0.138	0.218*
(FDI Inflow/GDP)			(5.846)	(3.076)	(3.381)	(3.048)			(0.539)	(1.167)	(1.142)	(1.858)
Log(Human Capital)				0.239**	0.247***	0.208*				0.070***	0.066**	0.068**
(Human Capital, % Change)				(2.543)	(2.643)	(1.803)				(2.822)	(2.549)	(2.847)
Log(Secondary Education)				0.132**	0.121**	0.114*				-0.025	-0.024	-0.021
(Secondary Students, % Change)				(2.191)	(2.043)	(1.881)				(-0.805)	(-0.731)	(-0.671)
Log(Telephone Lines)					0.019	0.031					-0.005	-0.001
(Tel. Line/ Population, % Change)					(1.616)	(1.564)					(-0.568)	(-0.125)
Log(Railways)					0.259*	0.266*					...	...
(Not available)					(1.817)	(1.846)						
Trade Openness						0.041						0.018*
(Trade Openness, % Change)						(0.481)						(1.901)

Table continues next page.

Log(Private Credit)						-0.009							0.005
(Private Credit/GDP, % Change)						(-0.948)							(0.865)
Crisis Dummy		-0.023	-0.032	-0.047**	-0.028	-0.025	-0.022	-0.048***	-0.045***	-0.043***	-0.042***	-0.041***	-0.039***
		(-0.340)	(-1.408)	(-2.532)	(-1.505)	(-1.409)	(-1.214)	(-3.671)	(-3.326)	(-3.474)	(-3.569)	(-3.118)	(-2.789)
Post-WTO Entrace Dummy		0.169**	0.044*	0.049**	0.039**	0.003	-0.000	-0.013	-0.012	-0.013	-0.013	-0.014	-0.014
		(2.540)	(1.861)	(2.606)	(2.094)	(0.136)	(-0.040)	(-1.431)	(-1.444)	(-1.406)	(-1.448)	(-1.554)	(-1.545)
Fixed Effect (Cross)													
	Cambodia	-0.264	-0.045	-0.083	0.036	0.304	0.240	-0.007	0.019	0.018	0.018	0.018	0.015
	Vietnam	0.009	-0.232	-0.600	-0.868	-0.850	-0.793	0.007	-0.008	-0.009	-0.010	-0.009	-0.009
	Thailand	0.254	0.277	0.683	0.831	0.546	0.553	-0.000	-0.010	-0.009	-0.008	-0.009	-0.005
Adjusted R^2		0.991	0.999	0.999	0.999	0.999	0.999	0.218	0.765	0.762	0.786	0.783	0.797
Cross-Section F		1.783	6.203***	26.725***	28.955***	16.743***	12.680***	1.063	2.765*	2.537*	1.949	1.887	0.790
Cross-Section Chi^2		3.873	12.996***	44.228***	48.095***	32.810***	27.077***	2.336	6.324**	5.928*	4.772*	4.711*	2.096
F-Statistics		1303.6***	8449.6***	11886.7***	10806.9***	9898.1***	8412.4***	4.028***	22.197***	19.945***	19.368***	17.1170***	16.963***
Observations		66	66	66	66	66	66	66	66	66	66	66	66

Notes: Variable names in the parentheses refer to those which are used in panel 2. Crisis dummy is valued at 1 to year 1997 and 1998 for all countries. Post-TWO Entrance dummy is valued at 1 from 1995 straight on for Thailand, 2004 onward for Cambodia, in 2007 and 2008 for Vietnam. Estimation period is from 1987 – 2008. . The results are obtained by using Fixed Effect Estimation.. *, **, *** denotes significant level at 90%, 95%, and 99% respectively. t-statistics are given in the parenthesis under estimated coefficient.
Source: Author's Computation as mentioned in the main text.

Three implications can be drawn from the above findings. First, FDI is not the crucial growth-stimulator in Cambodia, Vietnam, and Thailand; domestic factors by far play a more important role. Second, FDI-growth effect might be more substantial than that of domestic capital; however, given that it is much harder to call for than to increase domestic investment (at least as proportional to GDP), the overall effect of FDI should not overestimated. Third, FDI seems to uphold growth relatively in the long run, and its effect is witnessed only from its accumulated stock or conglomeration. This can partly explained by the fact that productivity effect from FDI is also a relatively long-run phenomenon. It takes some times to observe the impact of FDI inflow on economic growth, suggesting also that the relationship may move from growth to FDI in the short run. It is also arguable that, in order for long-term effect of FDI to materialize, it depends strongly on the policies being implemented in the short run.

4.4. FDI and Domestic Investment: FDI Policy Matters

One drawback from this study is that we cannot correctly separate FDI from domestic investment; therefore, as FDI contributes to capital accumulation, the higher the inflow of FDI, the higher the domestic capital formation. However, this is not always the case. Agosin and Mayer (2000) decorously state that FDI in the sectors which domestic firms are scare may have supplementary effect while FDI in sectors which there are plenty of competing domestic counterparts, it tends to reduce domestic entrepreneur. Domestic investors might be crowded out due to higher wage foreign firms pay, the easier conditions of credit they can access in domestic financial market, the share of domestic market they take away from local counterpart, and the superior technology they employ which may cause domestic firms to bankrupt due to inability to compete. The situation is worse in developing countries with imperfect competition practices, especially when ownership advantages of foreign firms translates into monopoly power which forces domestic ones to leave the market. Nicolas (2006), Milev (2008), and Tang (2008) add that the superior technology that foreign investors own enables them to exploit rapidly and effectively the profitable opportunity in domestic market. This reduces profits of domestic investors which are in shortage of technology and know-how. FDI deteriorates balance of payment, leads to higher price of capital goods and reduces potential domestic productivity. In a sense, FDI is said to disrupt backward linkage by substituting of imports for domestic commodities (Nicholas 2006).

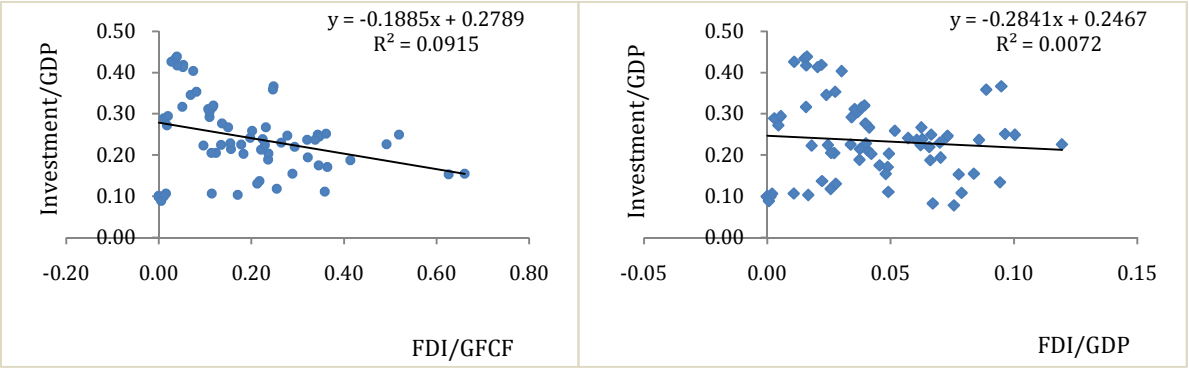
From this short brief of fact, domestic FDI-related policies have been widely argued to play a vital role in encouraging supplementary and discouraging complementary effect of FDI on domestic entrepreneurs. Screening procedures, linkage strategies, selective FDI policy[10], financial-system guiding principle, infrastructure improvement framework, and human resource development agenda can prevent crowding-out effect of FDI. As mentioned in previous section, Thailand and Vietnam had followed the first group of policies whereas the second group (or can be called "Indirect-FDI Policy) has been being implemented and upgraded continuously and concurrently by their government. This is completely contradictory to FDI's (direct) policy in Cambodia which such a kind of strategy has never been practiced at all.

[10] This policy includes the preferred type of foreign investment, sectors which foreign participation is needed, different incentives to different firms, ownership limitation and so on. They are termed "Direct-FDI Policy" in this paper.

The following section empirically analyses FDI's effect on the rate of gross fixed capital formation proportional to GDP in Cambodia, Vietnam, and Thailand; this connects with the speed of capital stock accumulation which was found to contribute the largest share to real GDP growth in the last 2 decades, meaning that the current investment will obviously transform into capital stock in the longer term. The payoff from liberalization is clearly unmistakable as the growth rate of capital stock in Cambodia which averaged only 4% during 1981-1990 doubled to 8.4% throughout 1991-2000 and increased further to 12.2% for the duration of 2001-2008. In Vietnam, too, capital stock has increased at unprecedented rate after 1993, averaging 12% per annum since then. Thailand had experienced higher speed of capital accumulation during 1981-1986 than Cambodia or Vietnam. Still, the highest rate of physical stock growth was, indeed, observed during 1986-1996 (averaged more than 11% per year) when liberalization was completely done. As domestic saving increase is just a very recent phenomenon and investment-saving gap (especially in Vietnam and Cambodia) is still high, the two-digit capital stock growth rate would not have been conceivable had they not decided to open up to the world. FDI is undoubtedly an important factor contributing to the high speed of domestic capital stock accumulation.

However, as shortly argued above, the effect of FDI on domestic investment rate is far from static and straightforward. Both graphical relationship and empirical evidences from this paper do not find that FDI is a catalyst or has crowding-in effect on domestic counterpart. Figure 3 plots FDI against domestic gross fixed capital formation by combing all countries together. As it depicts, investment rate appears to have negative correlation with FDI inflow. Although R^2 is very small, this adverse relation does not change even FDI is measured proportionately to annual investment amount itself or relatively to GDP size. Although it is not shown here, the relation does not change even FDI with one year lag is used instead of FDI_t. The empirical findings also confirm this.

Figure 3: Graphical Relationship between FDI and Investment



Notes: The figure is based on 1989-2008 periods. All are in current price.

Interestingly and also surprisingly, post-WTO entrance appears to impede rather than catalyze domestic investment. Compared to the result reported in table 3, we can observe that WTO accession positively advances output growth, but this effect fades away as more domestic growth fundamentals are controlled for. Its impact of per capita growth is all the times negative but statistically unconfirmed. All in all, these outcomes sufficiently prove that policy and regulatory reforms to be compatible with WTO's rule may unequally favor foreign

investors at the expense of domestic ones. Nondiscriminatory practice which is the core part of WTO's investment-related rule was not successfully found to drive economic progress in Cambodia, Vietnam, and Thailand at least when considering its effect on investment rate and income growth. This result is very firsthand in FDI-growth literatures, nonetheless. Therefore, it has to be inferred with care. As WTO's skeleton consists mainly of General Agreement on Tariff and Trade (GATT) and Trade-Related Investment Measurements (TRIMs), benefits from being a full member of WTO might come principally from trade and its related activities and/or foreign investment side (see section 4.6 for more detail).

Table 4: FDI and Domestic Investment – Pooling Estimations

	1	2	3	4	5
Constant Term	0.243***	0.032**	0.019	0.018	0.010
	(11.035)	(2.348)	(1.494)	(1.377)	(0.846)
FDI (t)	-0.055	-0.140	-0.148	-0.139	0.123
	(-0.113)	(-0.779)	(-0.928)	(-0.851)	(0.743)
FDI (t-1)	0.123	0.117	0.235	0.227	0.189
	(0.209)	(0.559)	(1.250)	(1.175)	(1.124)
FDI (t-2)	-0.126	-0.012	-0.090	-0.095	-0.131
	(-0.258)	(-0.067)	(-0.556)	(-0.575)	(-0.861)
INV (t-1)		1.241***	0.771***	0.783***	0.699***
		(10.016)	(4.317)	(4.137)	(4.192)
INV (t-2)		-0.357***	0.047	0.029	0.138
		(-2.832)	(0.299)	(0.172)	(0.920)
GDP Growth (t-1)			0.529***	0.529***	0.512***
			(3.932)	(3.855)	(4.228)
GDP Growth (t-2)			-0.093	-0.097	-0.111
			(-0.787)	(-0.800)	(-1.003)
FDI Stock (t-1)				0.006	0.020
				(0.408)	(1.211)
Investment Price (t-1)				-0.006	-0.012
				(-0.253)	(-0.518)
Crisis Dummy					-0.033***
					(-3.682)
Post-WTO Entrace Dummy					-0.019**
					(-2.193)
Fixed Effect (Cross)					
Cambodia	-0.093	-0.009	-0.018	-0.020	-0.022
Vietnam	0.023	0.006	0.008	0.008	0.001
Thailand	0.069	0.003	0.011	0.012	0.021
Adjusted R^2	0.481	0.934	0.948	0.946	0.959
Cross-Section F	26.691***	1.416	3.857**	3.645**	4.799**
Cross-Section Chi^2	41.245***	3.181	8.608**	8.484**	11.371***
F-Statistics	11.934***	112.019***	121.545***	96.050***	107.868***
Observations	60	60	60	60	60

Notes: Dependent variable is INVESTMENT/GDP. Crisis dummy is valued at 1 to year 1997 and 1998 for the three economies. Post-TWO Entrance dummy is valued at 1 from 1995 straight on for Thailand, 2004 onward for Cambodia, in 2007 and 2008 for Vietnam. Estimation period is from 1989 – 2008. Investment price is annual change of investment deflator at constant 1990 price. GDP growth is based on 1990 price while INV, FDI, and FDI stock enter as percentage of GDP. The results are attained by using Fixed Effect Estimation.*, **, *** denotes significant level at 90%, 95%, and 99% respectively. t-statistics are given in the parenthesis under estimated coefficient.

Moving to country case, the results are much more interesting. Current investment rate is positively and significantly related with previous year GDP growth in all countries. A one-percent increase in last year GDP causes this year investment rate to grow by 0.51% in Vietnam, 0.47% in Thailand, and 0.35% in Cambodia. Last 2-year output growth is found to

reduce current period investment in Cambodia and Vietnam, but stimulate it in Thailand. Past investment rates (lag 1 and 2 years) positively explain the investment at the present time in the three nations. As for investment price, there is not strong evidence suggesting that it negatively affects the rate of investment. This may be due partly to the relatively low variation of investment price (averaging 3.6% in Thailand, 6.3% in Vietnam, and 3.9% in Cambodia during 1989-2008 periods). In Thailand, both variables even have positive relationship, implying that, given her high level of entrepreneurship and better investment-protected environment, high price is a pre-signal of high return on investment.

FDI's effect on domestic investment rate is very diverse, depending on whether one thinks of it as inflow term or stock value. As yet, the net effect of the 4 FDI terms is negative in Cambodia but positive in Thailand and Vietnam. In Cambodia, when FDI (inflow term, % of GDP) is found to have positive effect on investment rate, its coefficient is not statistically confirmed. Previous 2-year FDI, nonetheless, is estimated to have a lone negative impact on the current investment. In Vietnam and Thailand, the picture is much different. Among the 3 terms of FDI, two of them are found to have a positive effect on investment rate. It is approximated that a one-percent increase in FDI inflow proportionate to GDP raises investment rate by 0.73% in Vietnam. In Thailand, one percent increase in last year FDI boosts current investment rate by more than 1.3%. Summing up the coefficients of FDI-inflow terms reveals that it has crowding-out effect on domestic investment in Cambodia but crowding-in effect in Vietnam and Thailand. This conclusion is backed by the estimation of Wald Test. Null hypothesis that $\beta_{LT} = 1$ can be rejected in Thailand and Vietnam's case but not in Cambodia's. In addition, the estimated β_{LT} is larger than 1 in Thailand and Vietnam but negative in Cambodia. The null hypothesis cannot be rejected in Cambodian milieu, implying that FDI has neutral effect on domestic investment in this country while it has crowding-in effect in the other two. This result confirms the finding by Agosin and Mayer (2000) and Nicholas et al. (2006) that, at least, no crowding-out effect is observed in Asia. Although this does not seem to be a skeptical finding, Cambodia does appear to be a loser.

Whether or not FDI policy has a role to play in determining the effect of FDI on domestic capital is, indeed, an issue that needs further confirmation. It might be that FDI-related policy can explain only a portion of the whole story while domestic conditions and indigenous firms' capacity equally shares an important part. However, the same results are also reported in previous literatures, e.g., while FDI in Thailand is usually found to complement investment, Giroud and Mirza (2006) found that Cambodia is the only host country which relationship between the share of overall supply purchased by foreign firms is negatively related to local supply linkage while in others (Thailand, Malaysia, and Vietnam), the relationship is positive, making the authors to conclude that differences in local supply linkage depends strongly on the level of development and local supporting industries in Host country. The root of the issue is quite clear now – domestic industries are the skeleton of growth and competition, and non-discrimination practices have not helped Cambodia to maximize most potentials from FDI at least when compared to Thailand and Vietnam.

Table 5: FDI and Domestic Investment – Country Cases

	Cambodia	Vietnam	Thailand
Constant Term	0.025*	0.002	6.855***
	(1.999)	(0.188)	(3.145)
FDI (t)	-0.016	0.727***	-0.978**
	(-0.121)	(2.913)	(-2.884)
FDI (t-1)	0.232	-0.271	1.333***
	(1.409)	(-1.313)	(3.234)
FDI (t-2)	-0.324*	0.001	0.637
	(-2.130)	(0.006)	(1.104)
INV (t-1)	0.221	0.509*	0.111
	(0.873)	(1.950)	(0.511)
INV (t-2)	0.350*	0.231	0.458**
	(2.136)	(0.846)	(2.787)
GDP Growth (t-1)	0.349**	0.519*	0.468**
	(2.658)	(1.763)	(2.171)
GDP Growth (t-2)	-0.256*	-0.490*	0.449**
	(-1.830)	(-2.045)	(2.525)
FDI Stock (t-1)	0.066**	0.101**	-0.109**
	(2.365)	(2.137)	(-2.202)
Investment Price (t-1)	-0.008	-0.001	0.229**
	(-0.441)	(-0.024)	(2.540)
Adjusted R_2	0.926	0.974	0.927
F-Statistics	27.351***	101.676***	38.029***
Observations	20	25	27
Wald Test Summary			
Null Hyphothesis β LT	-0.253	1.785	2.304
(Standard Error)	(0.363)	(0.733)	(1.179)
F-Statistic	0.487	5.750**	3.814*
Chi-Square	0.487	5.750**	3.814*

Notes: Dependent variable is investment/GDP. Estimation period for Cambodia is 1989-2008, for Vietnam is 1984-2008, and for Thailand is 1982-2008. Null hypothesis for Wald Test is β_{LT} = (FDIt+FDIt-1+FDIt-2)/(1-(INVt-1+INVt-2)) = 1 (estimated coefficient). Investment price is annual change of investment deflator at constant 1990 price. Growth rate is based on 1990 price while INV, FDI, and FDI stock enter as percentage of GDP. . The results are obtained by using OLS estimation with White Heteroskedasticity-Consistent Standard Error and Covariance.
*, **, *** denotes significant level at 90%, 95%, and 99% respectively. t-statistics are given under estimated coefficient.

When preceding-year FDI stock proxying for its conglomeration effect is taken into consideration, the results show that it has a positive relationship in Cambodia and Vietnam, implying that agglomeration economy of FDI creates complementarities with domestic firms and this may act as catalyst for development of local industries by demonstration effects. In Thailand, agglomeration effect of FDI is negative but it is offset, indicating that FDI's impact on investment in this country can be observed relatively in the short run.

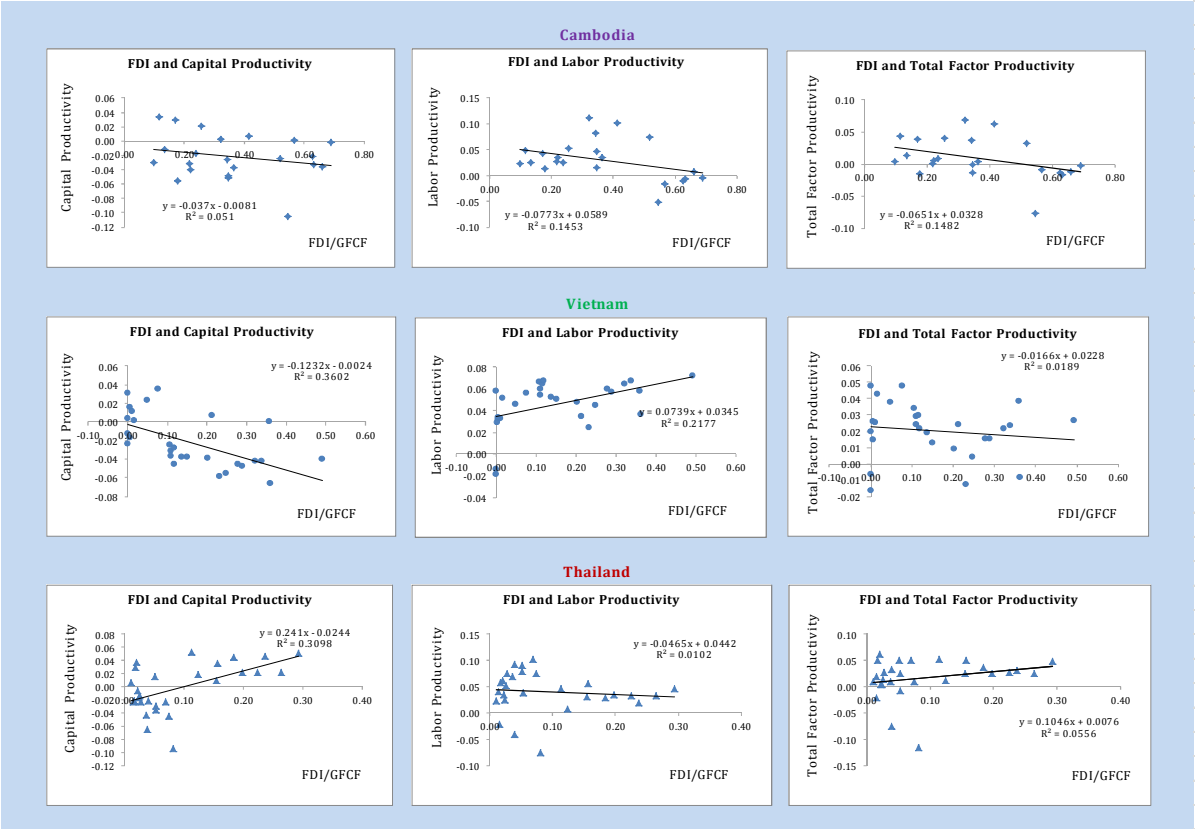
4.5. FDI and Productivity Growth: Positive but Different Patterns

There are multi-ways in which FDI can affect productivity in recipient countries. The most quoted one is via competition effect, meaning that the presence of foreign firms pressures domestic counterparts to speed up technology improvement in order to compete in the, say, perfect market. Other channels include linkage effect (backward-forward or buyer-supplier linkage), demonstration effect, and labor-movement effect. The backward-linkage effect happens when foreign affiliates purchase production inputs from local supplier while forward-linkage effect can be observed when foreign firms supply intermediate inputs to domestic counterparts (for detail explanation, see Taymaz and Yilmaz

2008, and Wang 2010). Demonstration effect occurs when local firms observe their foreign complements and try to imitate to produce the same products by simply copying some technology used by MNCs or foreign affiliates. Technology embedded in FDI and brought into Host countries by MNCs is expected to spill to other domestic firms via these effects, which at the end results in higher productivity growth for the whole economy. Moreover, foreign corporations might affect productivity directly too via importing technologically advanced capital, proprietary technology, licensing, and subcontracting arrangements (Phillips and Brunner 2007). Conversely, many authors find that foreign firms decide to invest abroad because they want to realize their technology advantage rather than disseminating technology to recipient countries. In addition, the potentials from productivity spillover depends very strongly on the technological capacity of indigenous firms, domestic conditions such as above-the-threshold human capital, effective and well-functioned institutions, and the stock of infrastructure necessary to facilitate technology-assimilation process and strengthen the absorptive capacity of the Host. Blomstrom and Kokko (1998) add that level of competition and trade policy matters; and in some case, foreign-introduced technology may be too costly and domestically unfitting.

There have been quite a lot of studies directing to estimate FDI's effect on productivity growth in many countries across the world. In the following section, we target the same purpose but place only Cambodia, Vietnam, and Thailand under consideration. At the first glance by looking at figure 4, we can visibly observe that FDI has different effect on productivity growth in the three economies. The figure plots FDI as percentage of GFCF at time t-1 against capital productivity growth, labor productivity growth, and TFP growth in the current period. For Cambodia, FDI does not appear to have significant positive relationship with any kind of productivity. As a net effect, FDI inflow negatively correlates with TFP growth for the whole period. In Vietnam, although its net effect on TFP growth also appears to be negative, FDI shows up as having positive impact on the growth of labor productivity with slope +0.07 and R^2 of around 22%. In Thailand, however, FDI graphically has a very strong and positive correlation with capital productivity with slope +0.24 and R^2 31%. The effect on labor productivity in Cambodia and Thailand seems negative but fundamentally unobservable due to trivial slope and insignificant R^2. Overall, figure 4 shows that FDI seems to have promoted TFP growth only in Thailand and labor productivity only in Vietnam.

Figure 4: Graphical Relationship between FDI and 3 Types of Productivity Growth



Notes: Cambodia – 1988-2008, Vietnam and Thailand – 1981-2008. FDI is FDI as percentage of Gross Fixed Capital Formation at time t-1. Capital productivity is the annual change of GDP per capital stock. Labor productivity is annual change of GDP per worker. TFP is estimated in the main text using trans-log growth accounting.

Empirical evidences relating FDI's effect on TFP and labor productivity growth is presented in table 6. It shows that $FDI_{(t-1)}$ positively upholds both kinds of productivity in all estimations, but current-period FDI does not. We also failed to find any promising effect of FDI conglomeration on productivity growth in the three economies from 1988-2008. This estimation suggests that if FDI is to have momentous effect on productivity, if any, it shall take one year to show up because, perhaps, domestic counterparts need time to learn, captivate, and get familiar with foreign technology even though it might take longer to localize it. Overall, a one percent increase of FDI-GFCF ratio last year boosts productivity growth in the current year by approximately 5 percentage points.

Table 6: FDI and Productivity – Pooling Estimations

Dependent Variable	Total Factor Productivity Growth			Labor Productivity Growth		
	1	**2**	**3**	**1**	**2**	**3**
Constant Term	0.426	0.482*	0.339	0.547**	0.711***	0.710***
	(1.130)	(1.970)	(1.388)	(2.365)	(2.795)	(2.864)
FDI (t)	-0.047**	-0.040**	-0.051**	-0.041	-0.036	-0.046*
	(-2.342)	(-2.134)	(-2.504)	(-1.510)	(-1.486)	(-1.933)
FDI (t-1)	0.048*	0.054**	0.049*	0.052*	0.050*	0.053*
	(1.942)	(2.245)	(1.908)	(1.753)	(1.833)	(1.861)
Human Capital	0.302**	0.170	0.106	0.161	-0.011	-0.188
	(2.297)	(1.155)	(0.809)	(0.798)	(-0.061)	(-1.226)
Secondary Education (t-1)	0.012	0.008	0.016	-0.058	-0.069	-0.060
	(0.279)	(0.188)	(0.392)	(-1.216)	(-1.537)	(-1.419)
Export of Goods	0.016	0.028	...	-0.010	-0.056	...
	(0.427)	(0.420)		(-0.130)	(-0.726)	
Import of Goods	0.093*	0.125**	...	0.149**	0.185***	...
	(1.881)	(2.050)		(2.426)	(2.828)	
Trade Openness	...	...	0.069*	...	...	0.092**
			(1.739)			(2.445)
Telephone Lines	0.029**	0.027**	0.025**	0.041**	0.037**	0.023*
	(2.261)	(2.637)	(2.139)	(2.489)	(2.628)	(1.755)
Private Credit	0.010	0.008	-0.007	0.042***	0.042***	0.028***
	(1.330)	(0.988)	(-0.838)	(4.770)	(4.557)	(2.985)
FDI Stock (t-1)	-0.016	0.011	0.002	-0.013	0.015	-0.000
	(-0.983)	0.468	(0.080)	(-0.765)	(0.611)	(-0.011)
Crisis Dummy		-0.038**	-0.037**		-0.045***	-0.041**
		(-2.266)	(-2.092)		(-2.674)	(-2.335)
Fixed Effect (Cross)						
Cambodia	-0.058	-0.135	-0.094	-0.135	-0.189	-0.186
Vietnam	0.035	0.068	0.037	0.099	0.124	0.110
Thailand	0.022	0.067	0.057	0.035	0.065	0.075
Adjusted R^2	0.266	0.396	0.388	0.289	0.472	0.435
Cross-Section F	2.049	2.916*	2.907*	4.669**	6.116***	7.234***
F-Statistics	1.417	2.721***	2.634***	3.296***	5.635***	5.342***
Observations	63	63	63	63	63	63

Notes: Estimation period is from 1988 to 2008 for all countries. Whenever trade openness is included, we have to take out export and import because they have very strong correlation with each other. Secondary education and FDI stock enters regression with one year lag because it takes some times so that its effect on productivity can be materialized. Private credit, human capital, secondary education, and infrastructure enter in their log form. FDI stock, export, import, and trade openness enter as percentage of GDP. *, **, *** denote significant level at 90%, 95%, and 99% respectively. t-statistics are given in parentheses under estimated coefficient.
Source: Author's Computation as mentioned in the main text.

Human capital stock is also found to stimulate TFP growth but not labor productivity growth, possibly because labor productivity itself is already imbedded in it the quality of labor. The result does not confirm any important role of export and secondary education. Nonetheless, infrastructure, import, and openness are found to considerably advance productivity in all economies. A 1 percent increase in infrastructure in term of telephone mainline in use boosts TFP growth by 0.03% and labor productivity by 0.04% at maximum. Pooling estimations also suggest that a 10% increase in import of goods proportional to GDP promotes TFP growth by 9 to 12 percentage point and labor productivity by 15 to 19 percentage points, indicating that import provides the greatest potentials for domestic firms to intensify learning and productivity. Private credit positively and strongly affects labor productivity, but its end product on TFP is inconclusive. The key explanation rests, perhaps, on the relation between financial market development and the increase of capital stock per worker, which in turn affects productivity of labor. Credit shortage poses

higher risk for long-term investment and also reduces entrepreneur's willingness to engage in neither long term investment nor business expansion. Credit constraint also limits the extent of job-training, other learning effect, and technological effort; therefore, it adversely affects the rate of productivity growth (Greenwald and Stiglitz 1989).

However, it is worth noting that adjusted R^2 is relatively low, ranging from 27% to 47% - implying that there are some other factors influencing productivity growth in Cambodia, Vietnam, and Thailand. Country's fixed effect correspondingly reveals that Cambodia seems to be the only country which experience productivity laggard as its coefficient is negative. This pattern was already witnessed in table 4 when FDI's effect on domestic investment was analyzed. But it is too early to jump into conclusion at this stage as country-case study might provide a better understanding.

The results of country specific estimation are shown in table 7. Because of the limitation of degree of freedom, some variables such as credit to private sector, secondary education, and trade openness are dropped. There are 2 panels for Cambodia – the first one uses TFP growth and the second uses labor productivity growth as dependent variable. It is worth noting that without interacting term, adjusted R^2 is extremely low. Therefore, table 10 reports only the results after including interacting terms between FDI and human capital as well as between FDI and infrastructure. Containing these terms, the fitness of the model becomes much improved, especially in panel 2 in which adjusted R^2 increases from 0.002 to 0.36 and 0.41 respectively. In addition, the coefficient of export and FDI_t is also strengthened considerably with interacting terms, suggesting that FDI itself has boosted neither TFP nor labor productivity in Cambodia. Including or disregarding interacting terms shows similar results – both coefficients of FDI inflow terms shows negative sign although only the coefficient of FDI_t is statistically significant. Productivity-effect of FDI can be materialized only when we control for multiplicative terms of FDI and human capital as well as FDI and infrastructure. The empirical evidences also suggest that export of goods, human capital, and infrastructure have promoted TFP and labor productivity in Cambodia from 1988 to 2008.

Conversely, FDI inflow proportional to gross fixed capital formation has a very strong positive effect on both kinds of productivity in Vietnam and Thailand even though the statistical significance can be proved only with FDI_{t-1}. A one percent increase in FDI-GFCF ratio stimulates TFP growth by around 0.05% in Vietnam and 0.3% in Thailand. Including interacting terms into TFP equation or labor productivity equation reveals unusual results for Thailand's case; therefore they are not presented. As for Vietnam, interacting terms have unexpected sign while FDI's, human capital's, and infrastructure's remains relatively unchanged. This implies that FDI affects productivity directly in Thailand and Vietnam rather than indirectly by interacting with human capital or infrastructure. Human capital, export of goods and infrastructure are two additional factors which are found to have boosted productivity growth in Vietnam from 1988 to 2008 whereas in Thailand human resource availability and import of goods have played a very important role. A one percent increase of goods import is estimated to stimulate TFP growth by ½ percentage point and labor productivity growth by 0.87 percentage points. Import is found to affect productivity significantly in Thailand because this country imports a lot more machineries and transport equipment for domestic production and usage than does Vietnam and Cambodia. As Urata and Yokota (1994) find out, since the latter half of 1980s, Thailand's import of capital input and intermediate input has expanded noticeably, and the contribution to TFP growth from

intermediate input accounted for as high as 77.6%. This phenomenon has continued throughout early 1990s and 2000s. In fact, during 2000-2008, machineries and transport equipment alone accounts for 55% of total merchandise import in Thailand compared to 39% in Vietnam and only 16% in Cambodia.

FDI conglomeration in Thailand is empirically found to have a positive effect on productivity although it is not statistically proved. This can be argued that FDI is less concentrated in Thailand than in Vietnam or Cambodia due to decentralization policy of FDI to less developed regions. In Vietnam, in addition to the fact that FDI companies concentrate only around Ho Chi Minh City and capital Hanoi, only 21% of 67 industrial zones is joint venture while 78% are Vietnamese-owned (see attached FDI Policies Paper). Compared results in table 5 and table 6, it can be seen that FDI conglomeration has significant effect on domestic investment in Cambodia and Vietnam. In Thailand, it has productivity effect albeit insignificant coefficient.

Table 7: FDI and Productivity – Country Cases

	Cambodia				Vietnam				Thailand	
	1		2		1		2		TFP	LABP
	TFP	TFP	LABP	LABP	TFP	LABP	TFP	TFP		
Constant Term	2.868**	2.059*	3.149**	2.364*	-0.582**	-0.858***	-0.939***	-0.858***	1.757***	1.356**
	(2.998)	(1.878)	(2.484)	(1.889)	(-2.415)	(-4.161)	(-4.741)	(-4.161)	(3.021)	(2.718)
FDI (t)	-1.804***	-0.926**	2.059***	-1.111**	-0.027	0.017	0.228	0.208	-0.180	0.002
	(-4.048)	(-2.789)	(-3.552)	(-3.038)	(-0.911)	(0.545)	(0.327)	(0.688)	(-0.838)	(0.010)
FDI (t-1)	-0.044	-0.022	-0.024	-0.003	0.052**	0.071***	0.054**	0.051**	0.337*	0.323**
	(-1.381)	(-0.549)	(-0.510)	(-0.057)	(2.338)	(3.524)	(2.994)	(1.978)	(2.011)	(2.243)
Human Capital	0.267	0.378*	0.285	0.249	0.173**	0.226***	0.249***	0.226***	0.571**	0.263
	(1.213)	(1.793)	(1.034)	(0.923)	(2.314)	(3.301)	(4.340)	(3.301)	(2.553)	(1.134)
Export of Goods	0.646**	0.477*	0.655*	0.474*	0.162***	0.036	0.142*	0.093	0.221	-0.173
	(2.491)	(1.794)	(2.086)	(1.825)	(3.334)	(0.965)	(1.867)	(0.793)	(0.697)	(-0.636)
Import of Goods	-0.024	0.013	0.070	0.116	0.026	0.026	0.060	0.093	0.494*	0.871***
	(-0.222)	(0.088)	(0.620)	(0.865)	(0.463)	(0.628)	(0.597)	(0.771)	(1.793)	(2.965)
Telephone Line	0.217*	0.085	0.070	-0.004	-0.011	0.014*	0.017*	0.019*	0.105	0.052
	(1.963)	(0.630)	(0.486)	(-0.028)	(-0.091)	(1.913)	(1.892)	(1.913)	(0.613)	(0.352)
FDI Stock (t-1)	-0.120	-0.020	-0.052	-0.002	-0.050***	-0.051**	-0.050**	-0.051**	0.172	0.057
	(-0.750)	(-0.129)	(-0.251)	(-0.010)	(-4.074)	(-2.604)	(-2.009)	(-2.604)	(0.861)	(0.330)
Crisis Dummy	-0.032*	-0.031	-0.034	-0.034	-0.008	-0.009	-0.007	-0.009	-0.129***	-0.100***
	(-1.962)	(-1.308)	(-1.248)	(-1.084)	(-0.753)	(-0.871)	(-0.458)	(-0.871)	(-6.005)	(-4.509)
FDI*Human Capital	0.607***	...	0.693***	...	...	...	-0.124	...	...	...
	(3.942)		(3.404)				(-0.466)			
FDI*Telephone Line	...	0.230**	...	0.277**	...	...	...	-0.014	...	...
		(2.664)		(2.835)				(-0.242)		
Adjusted R2	0.268	0.122	0.417	0.357	0.558	0.556	0.530	0.519	0.486	0.623
F-Statistics	1.817	1.310	2.592*	2.233*	4.162**	4.138**	3.509**	3.404**	3.708**	5.912***
Observations	21	21	21	21	21	21	21	21	21	21

Notes: Human capital and infrastructure enter regression in log form. Merchandise export and import and FDI stock enters as percentage of GDP. The results after including interacting terms are not reported in the case of Thailand due to the abnormality. *, **, *** denotes significant level at 10%, 5%, and 10% correspondingly. t-statistics are given in the parentheses under estimated coefficient. The results are obtained by using OLS estimation with White Heteroskedasticity-Consistent Standard Error and Covariance.
Source: Author's Calculation as mentioned in the main text.

From both graphical relationship and empirical evidences, it is safe to conclude that, in the last 2 decades, FDI has boosted productivity growth in all economies even though its effect is observed in different ways. In Cambodia where forced FDI policy such as local content requirement, ownership limitation and compulsory joint venture with domestic firms has never been implemented, FDI by itself has not had any effect on productivity at all. In Thailand and Vietnam, conversely, FDI is found to have increased productivity significantly. This study found some evidences showing that FDI indeed boosts productivity improvement in Cambodia, but this effect is very conditioned on domestic level of human capital and infrastructure.

The current work also failed to confirm that FDI-growth effect which conditions on other growth fundamentals can be generalized for all economies – it is very specific to each country and depends predominantly on policy they pursue. The result points to the statement that "much more liberalized FDI regime does not always lead to greater capacity to get use of it" (although it is a crucial factor to call for it). This proclamation is not new, but it is still suggestive for policymakers in other developing countries that if they think of attracting FDI, they have to think of developing their human resource, infrastructure, and some other domestic factors as complementary strategies. The same statement, thus, holds true not only between Latin America and Asia but also among Asian economies themselves.

4.6. Some Other Confirmations and Further Discussions

4.6.1. Confirmations

The estimated results presented in table 3 might be biased due to the problem on endogeneity. To clarify, we retest equation 2 (stock regression) by employing General Methods of Moment (GMM) which takes care of predetermined variables in case there are some. Since, if the number of independent variables is the same as predetermined ones, GMM is conceptually the same as OLS, we need to have more predetermined variables (defined as K, including a constant term) than the number of regressors (defined as L or independent variables) appeared in instrumental lists. To test whether the model is mis-specified or not we use J test introduced in Hansen (1982).[11] It is worth noting that if K = L, J = 0. If K > L, then J > 0. If the model fits the data well, J statistics is the same as Chi-square random variable, meaning that it is closer to 0. Conversely, if J-statistics is large, it means that orthogonality condition may be incorrect or the model is mis-specified. The null hypothesis is H_0 : J = 0 and alternate hypothesis is H_1 : J≠0. Under H_1, J → ∞; H_0 : J → χ^2_{K-L}. The computed value of J from the data is compared with the 0.95 quintile of significant level of the χ^2_{K-L}. The critical condition for the overall estimation of GMM is that:

- H_0 cannot be rejected at 95% level if J < $q^{\chi^2_{K-L}}_{0.95}$
- H_0 is rejected at 95% level if J > $q^{\chi^2_{K-L}}_{0.95}$

The challenging task is to find good instruments which can also be predetermined variables as well as exogenous variables because instruments must be strongly correlated to the independent variables and must also be uncorrelated with the error term. In this study, the instrument lists for GMM estimation consists of 14 variables while regressors consist only 10.

[11] For the detail of J-statistic, see Hayashi (2000: 217-218) and visit the following website: http://faculty.washington.edu/ezivot/econ583/gmm.pdf9).

We include real GDP as one of the instruments. In addition to GDP itself, credit to private sector, crisis dummy, post-WTO entrance dummy, and railway appear as instruments but not as independent variables. Human capital is the only variable which appears as independent variable but not in instrument list because we found that including this as predetermined one violates the basic assumption of the model. We also test for weak instruments and instrument validity suggested by Griffiths et al. (2008).

The results from GMM do not change much as the coefficient of inflation, capital stock, labor availability, FDI, and human capital still have their sign as expected; all are statistically confirmed. FDI's coefficient is still positive and statistical proved but considerably smaller than that of domestic capital stock (0.683 vs. 0.056). While openness's coefficient is positive, it is not statistically significant different from zero. The only variables which results in unexpected sign are secondary students and infrastructure. J statistic is approximated to be around 0.06. If we multiply by total number of observations (66), it becomes 3.96 which is smaller than Chi-square distribution with 95% confident level and K – L degree of freedom (9.48). Therefore, the null hypothesis which states that $H_0 = 0$ cannot be rejected at 95%, meaning that orthogonality condition is correct and the instrument lists of the model is well-specified.

To check for whether the surplus instruments are valid or not (over-identifying restriction), we calculate Sargan Test by first compute the GMM residuals and then regress them on all instrumental variables (totaling 14). We use NR^2 from this least square estimation to test the validity of surplus instruments. NR^2 will have the χ^2_{K-L} Chi-square distribution with K-L degree of freedom under the null hypothesis that instruments are uncorrelated with the error. It is found out that un-centered R^2 obtained after regressing IV equation residuals on 15 instrumental variables is around 0.87 and NR^2 statistic is 66 x 0.87= 57.42 This value is larger than Chi-square distribution with 95% confident level with K – L degree of freedom. Therefore, the null hypothesis that the surplus of instrumental variables is valid can be rejected at 95% level of confidence (results are not reported here).

As for flow regression, we tried to settle the problem of endogeneity by using FDI inflow-GDP as dependent variable and growth of per capita GDP as one of independent variables. The outcome did not signal that the estimation was worriedly deteriorated by this kind of problem as real per capita GDP growth resulted in positive but statistically insignificant coefficient. As for FDI and productivity regression, we tried to proxy FDI-GFCF by FDI inflow-GDP ratio and FDI stock-GDP ratio, but the results were abnormal and unsatisfied, implying that FDI-GFCF is the best proxy for FDI-productivity studies.

4.6.2. Discussions: Is there any Way for Cambodia?

With smaller population and GDP than Vietnam and Thailand, predominantly Cambodia has been able to attract FDI whose target is to serve the third market. As table 8 points out, among the top 5 factors which are most strongly correlated with the inflow of FDI, international trade openness, low wage, available workforce, and secondary education top the list in Cambodia. In Vietnam, low wage, population size, workforce availability, FDI conglomeration, and infrastructure appear as key determinants. In Thailand, even if openness comes as the main FDI determinant during 1986-2008, human asset, FDI agglomeration,

population, and workforce availability also share an equally important role.[12] The results are attained by employing simple correlation, but it does reflect the real situation that FDI inflow to Thailand and Vietnam is to seek for both market (local and international) and efficiency. From these outcomes, it is plausible to conclude that efficiency-seeking FDI is more likely to bring in host country technology and knowhow (UNCTAD 1998, Nunnenkamp and Spatz 2003). In addition, FDI aiming at serving domestic market can leave more rooms for Host government to set flexible (stricter) policies with greater bargaining power than FDI targeting third market. Accordingly, the linkage with domestic sector can be more substantial with the former type.

Table 8 also points out that Vietnam is very competitively advantageous over Thailand and Cambodia in term of relative investment price. The surge of Vietnam's investment price relative to Thailand and Cambodia does not affect investors' decision to invest in this country while the increase of investment price in Cambodia and Thailand might shift FDI direction from these economies to Vietnam, suggesting that foreign investors' truth on Vietnamese economy is expanding. Again, the result shows that Cambodia is competitive disadvantage against not only Vietnam but also Thailand. FDI might not substantially flow into Cambodia if she is not able to tackle the cost of doing business and strengthen investors' confidence.

The above findings did not argue that FDI is not important for promoting economic growth as Thailand and Vietnam has been proved successful in exploiting most benefits from foreign direct investment. Even though FDI inflow to Cambodia was not found to fuel economic growth as robustly as that inflow to her neighbors, empirical results did not show it had disastrous effect at all. The key concerns are twofold – *FDI policy* itself to maximize much of its benefits and *complementary strategies* to increase absorptive capacity, strengthen national competitiveness and attractiveness from foreign investors on international stages. The second method lies on, first, reducing cost of doing business, and second, investing in human capital and infrastructure, improving other economic sectors such as financial system, trade related policy, and institutional capacities.

Obviously, sheltering under the current pressure of globalization and being a member of WTO places Cambodia in a harder situation to implement such strategies as did Thailand in 1970s and 1980s and Vietnam in 1990s. But *selective liberalization approaches* is not impossible. Effective screening and prioritizing sectors which are seriously in need of foreign participation are both plausible and promising. Cambodia has almost completely lost economic fundamentals during 1975-1979. Nontransparent privatization initiated after 1989 and quick transition in 1993 caused many enterprises to go bankrupt and close down. Yet, industrial base which is said to be more diversified during 1983-1988 than it was during 1993-2002 [13] is now expanding again, resulting mainly from the contribution and

[12] Although one can also argue that trade openness can be interpreted as a factor augmenting efficiency-seeking motive of FDI, this may only partly apply to Thailand while in Cambodia most of the products produced locally are export-oriented.

[13] Cambodia lost a decade to diversify her industrial base as after 1993 most factories remained from pre-war period were closed down due to incapability to compete with cheap foreign imported products and nontransparent privatization to ineffective private and foreign sectors. From 1993 to early 2000s, Cambodia's industry was mainly textile and garment and food and beverages. However, since 2003, industrial base has started to diversify into heavier manufacturing such as cements, pharmaceuticals, motorbike assembly, foodstuffs, and now moving further toward simple automotive assemblage such as trucks, vans…

coordination from both foreign and domestic sectors. At this time, the need to create an environment in which domestic firms can prosper is becoming more crucial as their capacity to supply foreign counterparts is also intensifying.

Table 8: Correlation between FDI and Some of Its Determinants in Cambodia, Vietnam, and Thailand

Cambodia		Vietnam		Thailand	
Trade Openness (t-1)	0.773***	Wage (t-1)	0.879***	Trade Openness (t-1)	0.915***
Wage (t-1)	0.769***	Population (t-1)	0.860***	Human Capital (t-1)	0.914***
Private Credit (t-1)	0.725***	Workforce Availability (t-1)	0.823***	FDI Stock (t-1)	0.903***
Workforce Availability (t-1)	0.722***	FDI Stock (t-1)	0.777***	Population (t-1)	0.902***
Secondary Students (t-1)	0.716***	Telephone Line (t-1)	0.742***	Workforce Availability (t-1)	0.896***
Railways	0.709***	Human Capital (t-1)	0.706***	Telephone Line (t-1)	0.891***
Population (t-1)	0.686***	GDP Growth (t-1)	0.673***	Railways	0.867***
Telephone Line (t-1)	0.661***	Investment Price (t-1) Cambodia	0.649***	Wage (t-1)	0.865***
Post-WTO Entrance Dummy	0.657***	Private Credit (t-1)	0.632***	Private Credit (t-1)	0.820***
Human Capital (t-1)	0.656***	Trade Openness (t-1)	0.629***	Secondary Students (t-1)	0.803***
FDI Stock (t-1)	0.596**	Secondary Students (t-1)	0.577**	Post-WTO Entrance Dummy	0.723***
GDP Growth (t-1)	0.570**	Investment Price (t-1) Thailand	0.563**	Investment Price (t-1) Cambodia	0.460*
Current Account Balance (t-1)	-0.029	Post-WTO Entrance Dummy	0.331	Current Account Balance (t-1)	0.282
Investment Price (t-1) Thailand	-0.349*	Corruption Index[1]	0.156	Inflation Rate (t-1)	0.158
Corruption Index[1]	-0.627***	Railways	0.151	GDP Growth (t-1)	-0.233
Inflation Rate (t-1)	-0.628***	Current Account Balance (t-1)	0.091	Corruption Index[1]	-0.252
Investment Price (t-1) Vietnam	-0.777***	Inflation Rate (t-1)	-0.700***	Investment Price (t-1) Vietnam	-0.534**

Notes: Estimation period for Cambodia is 1987-2008; for Thailand and Vietnam, 1986 – 2008. [1]: Since corruption index is available only from 1995; its correlation with FDI is from 1995-2008. Investment price Vietnam for Cambodia, for instance, is included as Cambodia's investment deflator/Vietnam's investment deflator (1990 constant price). Except for current account balance, investment price, inflation, GDP growth, and trade openness, all variables are in log form. Wage is calculated by the author using compensation to employees adjusted for the income of self-employed divided by total employed population. Post-WTO entrance dummy is valued at 1 from 1995 for Thailand, 2004 for Cambodia, 2007 for Vietnam. (t-1) denotes one year lagged value. Railways are included without lag because this variable has not changed over time, and corruption index appears without lag due to its shorter data availability. Correlation and its significant level are calculated by the author using simple method in Ms. Excel.

It is worth noting that industrial base in Thailand and Vietnam has been stronger than that of Cambodia from earlier periods as government in both economies devoted much capital to uphold it. Together with selective FDI policies, this can partly explain why the presence of foreign firms was found to crowd in domestic investors. The prerequisite for Cambodia to reap FDI's benefit so that it can crowd it domestic counterpart is thus twofold – she has to create and expand domestic industries and finds way to place them in connection with foreign firms. Clearly, local content requirement and compulsory joint venture with local partnerships is not the way she has to opt for. Here, the role of FDI incentives can solve the problems. For example, QIPs and supporting QIPs whose 100 percent of their production is supplied to export industry and as a substitution for the regularly imported raw materials or accessories are eligible for exemption from profit tax, import duties for construction materials, production equipment and production input materials (it is worth pointing out that although Cambodia produces garment and textile on a large scale, the import of these products accounts for 51% of total merchandise import during 2000-2008). Government should pay particular attention to domestic firms and SMEs to ensure that they have capacity to supply to and compete with foreign counterparts and assimilate foreign technology.

Supporting strategies play no less important role. They can still be applied to Thailand and Vietnam because, although empirical estimation could not capture the effect of human capital and infrastructure availability on absorptive capacity in both economies, it is still irrational and costly to assume away their effect on growth and such an encouraging effect would not have been possible had their government not intensively invested in human capital and infrastructure. By putting great effort to improve economic fundamentals, host countries can both strengthen FDI's attractive capacity and absorptive capacity. At the same time, it also helps domestic firms to assimilate technology and knowhow spilled over from foreign counterpart. This essential is much more pronounced if forced FDI-policy to use local input and pressure foreign firms to spill their technology over to domestic sector cannot be implemented.

5. Conclusion and Policy Implication

By and large, by analysing the effect of FDI on economic growth in Cambodia, Vietnam, and Thailand, FDI is not found to be growth-deteriorated. FDI was found to have crowding-in effect on domestic investment in Vietnam and Thailand, but it was shown to have neutral effect in Cambodia. FDI was empirically found to have positive effect on productivity too, but this effect could be capture only by conditioning on human capital and infrastructure in Cambodia while in the other two, FDI-productivity effect can be observed without any condition on domestic growth fundamentals. The last part of the current paper searches for the factors which attract the inflow of FDI into each economy by using simple correlation analyses, and it is found out that FDI flow to Cambodia mainly is to explore the access to international market and cheap workforce. In Vietnam and Thailand, large and growing market, workforce availability, and agglomeration are the key factors to call for FDI. This outcome also suggests that where FDI's motivation is to seek untapped market and efficiency, Host government can have more rooms to set stricter policy. Additionally, market-seeking and efficiency-seeking FDI tends to have supplementary effect with domestic investment and productivity than does third-market seeking FDI.

FDI's benefits to Host country cannot be automatically generated neither by laissair-fair policy nor complete liberalization all at once. The current study failed, as others' did, to take into account the effect of FDI policy into empirical analyses, but first-hand evidences did reveal that Cambodia has not been able to get most use from FDI yet due to loopholes in FDI and its related policy. Neither does the study imply that FDI policy of Vietnam and Thailand is flawless and should be imitated. At least, gradually liberalizing FDI policy with intensive investment in other economic sectors has proved helpful. To make the most of benefits from FDI, developing country's government should not free up everything all at once, it should target type of FDI and industry which its participation is chiefly in need, and the development of domestic firms should not be overlooked. At the same time, FDI strategy cannot go alone without supporting policy as did Thai and Vietnamese government.

The study does not argue that FDI-regime liberalization and entering WTO is not important as there are evidences showing that both affect economic and income growth positively. However, the study equally stresses the significance of domestic development policy by drawing constructive lessons from Cambodia, Vietnam, and Thailand's case. More importantly, a closer study with more modern technique and better dataset is needed in order to set out a faultless policy implication.

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