The Impact of Trade Openness, Foreign Direct Investment and Domestic Investment on Economic Growth: New Evidence from Asian Developing Countries

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Abstract:

The objective of this paper is to examine the impact of openness, foreign investment inflows, and domestic investment on economic growth for the case of 24 Asian economies over the time span 2002-2017 through the use of the fixed and random effect models. Our empirical results pointed out that domestic investment positively influences economic growth. However, we found that foreign direct investment and exports are negatively affecting the growth path. Also, the population, imports, and final consumption expenditure have no real impact on economic growth. Due to the importance of the positive externalities linked to the trade openness and foreign direct investments inflow, in terms of technology transfer bias, financial capacities, human expertise, large markets size, and spillover effect added to the domestic capacities and the national investment, the pace of the phenomenal economic performance of the Asian economies is very well justified.

Keywords: Trade openness, FDI, Domestic Investment, Economic Growth.

JEL classification: E22; F14; O16; O47; O53

1. Introduction

The foreign openness, foreign direct investment inflows, adding to the domestic investment have played a curial role in the great economic performance of the Tigers and dragons of the Asian economies, especially, over the 97s Asian crises with the massive influx of foreign capacities in terms of investments.

Indeed, these determinants of economic growth are assumed as the dashboard of any economy and significantly altered the economic performance.

The controversial impacts of trade openness, foreign direct investments, and domestic investment on economic growth have been the topic of an impressive body of literature, international debates, and strategic agreements.

Indeed, several works have treated these macroeconomic aspects influence on the aggregate growth measure {see Barro and Sala-i-Martin (1995); Borensztein et al. (1998); Anwar and Sun (2011); Soltani and Ochi (2012); Tiba et al. (2015); Bakari and Mabrouki (2018)}. In this regard, these works pointed out the importance of the transmission channels on growth in the long-term.

To the best of our knowledge, none of the previous studies have treated the influence of these three macroeconomics aspects on the economic growth for the case of the Asian economies. Due to the importance of these aspects in providing great economic performance, also, with the increase of the pace of the foreign openness and the foreign investment, we are motivated to treat this issue in the Asian economies which greatly have had the lion-share in terms of FDI and trade openness compared to other ones.

In order to assess the influence of trade openness, foreign direct investment and domestic investment on economic growth, the model to be estimated, the variables introduced and the estimation method should be to proceed to the interpretation of the results of the regressions.

The rest of the paper is structured as follow: Section 2 describes the model construction and data. Section 3 portrays the methodology. Section 4 contains the empirical results, and the conclusion of the paper is given in Section 5.

2. Model specification

Referring to the works of Kahouli and Maktouf (2015), Sakyi and al (2015), Solarin and Shahbaz (2015), Kahouli and Omri (2017) the basic model is written as follows:

$$Y_{it} = \beta_0 + \beta_1 DI_{it} + \beta_2 FDI_{it} + \beta_3 P_{it} + \beta_4 FCE_{it} + \beta_5 X_{it} + \beta_6 M_{it} + \gamma_i + \varepsilon_t$$

Where **'Y'** is the logarithm of gross domestic product (2010 constant US $), **'DI'** is the logarithm of gross fixed capital formation (2010 constant US $), **'FDI'** is foreign direct investment, net inflows (% of GDP)), **'P'** is the logarithm of the total population (in millions of inhabitants), **'FCE'** is the logarithm of Final consumption expenditure (constant 2010 US $), **'X'** is the log of total exports (2010 constant US $), **'M'** is the log of total imports (2010 constant US $), **'γ'** is a country-specific effect not observed, **'ε'** is the term error, **'i'** is the individual dimension of the panel (the country) and **'t'** is the temporal dimension.

The main goal of this study is to investigate the effect of trade openness, foreign direct investment and domestic investment on economic growth for 24 developing countries[1] in Asia over the period 2002 - 2017[2]. All data are obtained from the World Bank database.

3. Econometric methodology

In empirical studies of foreign direct investment and international trade, the gravity model is an eclectic model for achieving this goal {see Roy and Rayhan (2011); Subasat and Bellos (2011); Kahouli and Maktouf (2014); Kahouli and Maktouf (2015); Paniagua (2015)}.

In the case of a gravity model, we must take into account the existence of less or more pronounced individualities between the elements of the sample and the relationships they maintain between them.

In fact, it is shorthand to consider that the set of bilateral relations between the elements of the sample can be represented in a single equation with common criteria. For this reason, it is necessary to take into account the diversity of individuals and their respective bilateral relations that we admit that it is rational to introduce into the equation, additional elements reflecting the diversity of the population composing the panel.

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[1] Afghanistan, Armenia, Azerbaijan, Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Iran, Kazakhstan, Malaysia, Nepal, Oman, Pakistan, Philippines, Saudi Arabia, Sri Lanka, Tajikistan, Thailand, Timor-Leste, Turkmenistan, United Arab Emirates and Vietnam
[2] The choice of the sample's size and the period of study depend on the ratification of data.

Theoretically, the question is whether to specify the equation according to the panel data methodology with fixed individual effects or random individual effects.

Our purpose here is not to expose the whole theory of different forms of individual effects or different types of specifications in the context of panel data analysis. We will attempt to describe the two types of individual effects most used in the literature, namely fixed effects and random effects.

The most widely used theoretical solution to determine which of the two types of estimates (fixed effects or random effects) would be more appropriate is the Hausman test.

4. Empirical analysis

Before the presentation of the empirical results, there is some pre-tests of data are generally considered very essential to provide some prerequisites or information about the relevance of the targeted variables.

Table 1 Descriptive statistics individual sample

	Y	DI	FDI	P	FCE	X	M
Mean	1.23E+15	6.22E+13	3.429202	1.35E+09	5.29E+14	6.41E+14	2.41E+14
Median	1.36E+11	2.91E+10	2.021002	67369469	9.65E+10	4.27E+10	4.39E+10
Maximum	6.90E+16	1.29E+16	55.07590	2.90E+10	3.80E+16	1.90E+17	5.02E+16
Minimum	8.25E+08	80179365	-3.152789	606399.0	6447688.	27340249	17.23491
Std. Dev.	8.41E+15	8.62E+14	5.304190	4.00E+09	3.97E+15	9.89E+15	2.98E+15
Skewness	6.950733	13.89076	5.940680	3.832544	7.690102	18.49390	14.17589
Kurtosis	50.39616	195.2468	51.72907	18.52210	62.31085	353.2161	220.4746
Jarque-Bera	39034.35	603690.3	40251.02	4795.026	60069.24	1984311.	769584.1
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	4.73E+17	2.39E+16	1316.813	5.20E+11	2.03E+17	2.46E+17	9.27E+16
Sum Sq. Dev.	2.71E+34	2.84E+32	10775.49	6.13E+21	6.05E+33	3.75E+34	3.40E+33
Observations	384	384	384	384	384	384	384

According to Table 1, all variables have a probability of refusal of less than 5%, which indicate that they are all considered during the study period. Skewness and Kurtosis other statistical measures reflect the either focused variables are following the normal distribution or not. Skewness individually measures the strength of outlier. All given variables are positively skewed. As far as the matter of kurtosis it measures the peakedness or flatness of targeted variables relative to a normal distribution. Kurtosis coefficients values of all variables reflect the peakedness. Overall skewness and kurtosis coefficients attest the variables are following the normal distribution.

Table 2 reports the results of the Pearson correlation between all the panel series of variables. The correlation coefficients insinuate that the fetched regression model will not be earnestly biased by multicollinearity.

Table 2 Pearson correlations

	Y	DI	FDI	P	M	X	FCE
Y	1						
DI	0.82	1					
FDI	-0.10	-0.05	1				
P	0.22	0.31	-0.01	1			
M	0.48	0.56	-0.20	-0.15	1		
X	0.73	0.86	-0.004	0.27	0.46	1	0.
FCE	0.70	0.70	-0.04	-0.06	0.38	0.68	1

Table 2 shows that economic growth correlates positively with domestic investment, population, imports, exports, and final consumption expenditure. Also, economic growth correlates negatively with foreign direct investment.

In Table 3 and 4, we commence by interpreting the findings of static models for the fixed effect estimator and random effect.

Table 3. Estimation of Fixed Effect Model

Dependent Variable: Y				
Method: Panel Least Squares (Fixed Effect)				
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.88899	3.070461	4.197738	0.0000
DI	0.696479	0.073301	9.501613	0.0000***
FDI	-0.051395	0.015761	-3.260862	0.0012***
P	0.067956	0.114443	0.593801	0.5530
M	0.025908	0.057700	0.449014	0.6537
X	-0.269859	0.058238	-4.633747	0.0000***
FCE	0.035093	0.050677	0.692490	0.4891
R-squared		0.847204		
Adjusted R-squared		0.834687		
Durbin-Watson stat		1.738893		
F-statistic		67.68319		
Prob(F-statistic)		0.000000		
***; ** and * indicate significance at 1%, 5% and 10%, respectively*				

The results of the estimation of the Fixed Effect Model are presented in Table 3. The coefficient of domestic investment is positive and statistically significant at 1 percent. This suggests that domestic investment strongly influences economic growth.

The coefficients of foreign direct investment and exports are negative and statistically significant at 1 percent level. Also, the coefficients of the population, imports, and final

consumption expenditure are statically insignificant. This suggests that foreign direct investment, exports, population, imports, and final consumption expenditure are not a source of economic growth.

Table 4. Estimation of Random Effect Model

Dependent Variable: Y				
Method: Panel EGLS (Cross-section random effects)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.482784	1.913737	2.864962	0.0044
DI	0.750138	0.070635	10.61996	0.0000***
FDI	-0.045398	0.015249	-2.977079	0.0031***
P	0.093448	0.070551	1.324536	0.1861
M	0.061926	0.039173	1.580839	0.1148
X	-0.171348	0.053986	-3.173945	0.0016***
FCE	0.134296	0.043205	3.108317	0.0020***
R-squared	*0.346927*			
Adjusted R-squared	*0.336533*			
Durbin-Watson stat	*1.591700*			
F-statistic	*33.37842*			
Prob(F-statistic)	*0.000000*			
***; ** and * indicate significance at 1%, 5% and 10%, respectively*				

Concerning the estimation of Random Effect Model, Table 4 shows that the coefficients of domestic investment and final consumption expenditure are positive and statistically significant at 1 percent. Random Effect Model suggests that domestic investment and final consumption expenditure strongly influence economic growth.

The coefficients of foreign direct investment and exports are negative and statistically significant at 1 percent level. Also, the coefficients of population and imports are statistically insignificant. This suggests that foreign direct investment, exports, population, and imports don't have any effect on economic growth.

In Table 6 we will apply the Hausman Test. The aim of this test is to state and choose our most appropriate model, whether fixed or random[3].

Table 5. Hausman Test

Hausman Test			
Test Summary	*Chi-Sq. Statistic*	*Chi-Sq. d.f.*	*Prob.*
Cross-section random	22.731740	6	0.0009
***; ** and * indicate significance at 1%, 5% and 10%, respectively*			

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[3] If the probability of the Hausman Test is minimal than 5%, in this case, the fixed-effect model is significant and will be kept. However, if the probability of the Hausman Test is major than 5%, in this case, the random effect model is significant and will be possessed.

Table 5 shows that the probability of the Hausman Test is fewer than 5% to a value equal to 0.0009%. This means that the fixed effect model is significant and will be retained. Based on the output of the estimation of the Fixed Effect Model, diagnostic tests indicate that the results of our estimate are acceptable and our model is well treated.

5. Conclusion

Due to the importance of trade openness, FDI, and domestic investment which are greatly contribute to the great economic performance of the Asian economies. Indeed, we attempt to investigate the impact of trade openness, foreign direct investment inflows, and domestic investment on economic growth for a sample of 24 Asian economies over the period 2002-2017 by applying the fixed effects or random effects models.

With respect to the fixed effects regression results, our empirical results pointed out that the domestic investment positively influences economic growth. However, we found that foreign direct investment and exports are negatively affecting the growth path. Also, the population, imports, and final consumption expenditure have no real impact on economic growth.

With respect to the random effects regression results, our results recorded that the domestic investment and final consumption expenditure have a positive impact on economic growth. However, we reported a negative influence of foreign direct investment and exports on growth. Also, the foreign direct investment, exports, population, and imports have no real impact on growth.

Our empirical results provide important policy implication, hence the trade openness and foreign direct investment inflows with their positive externalities (in terms of technology transfer bias, financial capacities, human expertise, large markets size, and spillover effects) added to the domestic capacities and the national investment, justify the phenomenal economic performance of the Asian economies.

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