Article

Economic Development in Africa and the Shifting Epicenter of Global Growth to Asia

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Abstract

As the epicenter of the global economy is shifting towards East Asia, this paper aimed at quantifying the extent to which bilateral trade between East Asia and Africa is an "engine" of economic growth in Africa. Results based on fixed-effects estimation using panel data suggest significant positive impacts in sub-Saharan Africa. Another finding implies that not only what African countries trade matters but also their bilateral trade interactions with East Asian economies do also matter. At the end, the findings imply a boost in human capital in Africa as the necessary condition for materializing the growth potentials from their trade interactions with East Asia.

Ⅰ. Introduction

In the 1980s and early 1990s, the United States and western Europe had been the center of the global economy with some emerging economies from Asia including Japan and South Korea along with Latin America and Africa on the periphery. In the 2000s, Asian economies especially China's economy, have grown much faster than their western counterparts, which resulted in a rapid shift of the center of the global economy to the eastern hemisphere and Asia (Quah, 2011). This has led China to own far greater spillovers to the rest of the world than in the past, particularly in developing countries such as those in sub-Saharan Africa. For many African countries, China has become an essential export market for African raw-material exporters, which has benefited from both economies of scale and unprecedented trade growth since the early 2000s (Maswana, 2009). In addition to the mere export revenues, African exporting firms benefit from economies of scale while accessing new technologies through cheaper imported intermediate goods, which ultimately improves productivity. Therefore, the ongoing eastward global economic shift and its impact on the economic growth of African countries are now too large to ignore.

Although the standard Solow's growth model (Solow, 1956) predicts income convergence

among similar countries in autarky, later studies show that international trade may enhance the growth process, either through the diffusion of technology (e.g., Jovanovich and Lach, 1990) or knowledge (e.g., Grossman and Helpman, 1991). Hence, examining the role of bilateral trade in per capita income growth is vital in the era of unprecedented deepening economic interactions between Africa and Asia.

The question that arises is how the rise of Asia as the world economic epicenter conditioned economic development in Africa. This paper used panel fixed-effects regressions to analyze this question of the contribution of East-Asia-Africa's bilateral trade to the process of economic growth in a sample of 42 sub-Saharan African countries.

The present paper departs from the majority of empirical studies of economic growth that focus on broad trade openness and thus ignore the contributions of bilateral trade with the fast-growing trading partner or region. Not only what countries trade matters (see, Hausmann et al., 2007), but also with whom they trade do matter. In the context of Africa, Baliamoune-Lutz (2019) indicated that the destination of a country's exports is an important factor in the exporting country's growth. This corroborates the observation by Mendoza (2010) that "whom you trade with matters, as richer and more technologically advanced trading partners offer more scope for trade-induced learning."

The structure of the paper is organized as follows: Section 2 reviews the literature. Section 3 describes the theoretical model while Section 4 describes the data and presents the empirical results. Section 5 discusses policy implications and concludes.

Ⅱ. Theoretical consideration

Much has been written about the empirics of the trade-growth nexus. Several studies support a positive relationship between international trade and economic growth. Among these studies include Romer (1990) which indicated that international trade is a source of innovation, productivity, and economic growth. International trade is thought to allow developing countries to benefit from modern technologies in the developed world, and access to intermediate goods, which is vital to their economic growth process. There have been arguments that developing countries receive more benefits by trading with the developed world, and there will be convergence in the future (Rodriguez & Rodrik, 2000). It goes without saying that accelerated technological progress could be driven by increased imports of capital goods, increased technology transfer, increased foreign direct investment, and/or increased incentives for imitation and innovation. All of these factors are empirically positively correlated with international trade (Ismail, 2008). Also, through learning-by-doing and technology transfer, the country experiences technological progress, its production becomes more efficient, and its productivity increases.

With the emergence of endogenous growth theories, economic growth theories moved to recognize that countries differ in many aspects including the tendency to save, working hours, and accessibility to foreign markets. As Islam (1995), among others, suggested, if these aspects are controlled, the convergence applies only in a conditional sense. Although much of the scholarly contribution of the trade-growth nexus comes from the endogenous growth models, most of which focus on innovation, their relevance in the African countries' context is doubtful. Scholars such as Grossman and Helpman (1991) emphasized the importance of R&D and new inventions in improving the growth rate through international spillovers; however, no innovation has been involved in the African context. The most plausible spillovers through which the world stock of knowledge might have affected African economic growth are likely to be international trade channels. This type of transfer of knowledge is qualitatively different from new inventions that are considered critical in the endogenous-growth models (Findlay, 1996). Moreover, international trade has indeed been found to play a role in the economic growth of African countries in fostering technological progress via a form of imitation embedded in imports of intermediate goods (Maswana, 2015). International trade could make technical progress, leading to more permanent economic growth.

There have been scholarly attempts in testing theoretical growth models and alternative determinants such as international trade or human capital. For instance, Mankiw et al. (1992) performed an empirical evaluation of a Solow (1956) growth model augmented with human capita, as a factor of production, using a multi-country dataset for the period 1960–1985, and ended up with strong evidence for conditional convergence. Still, empirical investigations have yielded inconclusive results. In contrast to the largely dominant argument in favor of trade benefits, other studies argue that certain types of trade openness are harmful to economic growth. Baliamoune-Lutz and Ndikumana (2007), for example, indicated that higher trade openness negatively affects economic growth in Africa. Furthermore, Rodriguez and Rodrik (2000) explain the hurdles in figuring out definitive evidence in the trade-growth nexus. This warrants further investigation, especially in the case of African countries where more data is becoming available in recent years.

Importantly, most studies in the literature related to trade-growth nexus are built on standard growth models of either Solow (1956), or its variants (e.g., Mankin et al., 1992), or even variants of endogenous growth model (e.g., Grossman and Helpman, 1991). Clearly, each perspective is based on specific sets of assumptions and predictions made either for tractability purpose or relevance with real-world facts. Accordingly, the present study follows this perspective in setting up the theoretical model.

Ⅲ. Basic Model Setup

Our point of departure is the Augmented-Solow model by Mankiw et al. (1992) where output is produced using physical capital, K, human capital, H, and labor, L, given the available technology, A. Moreover, it is assumed that the production function exhibits constant returns to scale. The Cobb-Douglass production function is specified as in the following panel form:

$$Y_{i,t}=(K_t)^{\alpha}A((H_t)^{\beta}(L_t)^{1-\alpha-\beta}) \qquad \alpha>0,\ \beta>0,\ 0<\alpha,\ \beta<1 \tag{1}$$

Population and particularly capital are assumed to growth exogenously, as follows (see, Mankiw et al., 1992). Assuming that the fraction of national income is invested in physical capital, human capital and maintenance, represented respectively by s_k, s_h, and s_m. The following two extended and empirical dynamic equations, expressed in quantities per unit of effective labor, can be used to determine the evolution of the economy (cf., Mankiw et al., 1992).

$$L_t=L(0)e^{nt} \tag{2}$$

$$A_t=A(0)e^{gt} \tag{3a}$$

Following Rivera-Batiz and Romer (1991), it is assumed that the world stock of knowledge is available for any country via international trade. From Mankiw et al. (1992), trade effects can be modelled as a technology-shifting variable, as in Knight et al. (1993) in which productivity A grows exogenously according to the rates of technological progress and trade openness, given as follows:

$$A_t=A_0e^{gt}T^{\theta} \tag{3b}$$

where g is the exogenous rate of technological progress, T can be seen as capturing the determinants of the development of technology such as international trade, which differ across countries (Gundlach, 2005), and θ is the trade elasticity. This modification is important when considering economies in developing countries "where technological improvement tends to be absorbed domestically through imports of capital goods and where the productive sector's efficiency may depend heavily on the level of fixed investment undertaken by the government" (Knight et al., 1993, p. 516).

Moreover, it should be noted that the Solow's growth model (1957) assumed that the rate of saving in any economy is the same as the rate of investment in physical capital, as expressed in units of effective labor. Furthermore, the following redefinition in terms of effective labor is in order. Output per unit of effective labor is defined as: $y=Y/AL$; Physi-

cal capital per unit of effective labor as: $k=K/AL$; and the human capital per unit of effective labor as: $h=H/AL$.

Furthermore, contrary to the Solow model that only derives a steady-state level of physical capital, Mankiw et al. (1992) built on the idea that savings can be used not only to build physical capital, but also to build human capital. They assumed that the total level of savings can be broken down between s_k and s_h. where s_k is the proportion of income invested in physical capital and s_h is the percentage of income that is invested in human capital. Consequently, their model currently has two steady states and describes two separate dynamics of capital accumulation.

$$\triangle h_t = s_h y_t - (\eta + g + \delta) h_t \tag{4}$$

$$\triangle k_t = s y_t - (\eta + g + \delta) k_t \tag{5}$$

The respective steady state of human capital and physical capital are given by:

$$h^* = \left\{ \frac{s_k^{\alpha} s_h^{\beta}}{(\eta + g + \delta} \right\}^{\frac{1}{1-\alpha-\beta}} \tag{6}$$

$$k^* = \left\{ \frac{s_k^{1-\beta} s_h^{1-\alpha}}{(\eta + g + \delta} \right\}^{\frac{1}{1-\alpha-\beta}} \tag{7}$$

Substituting equation (6) and (7) into the production function (Equation 1) and expressing the variables in logarithmic form, the steady state empirical long-run growth equation can be expressed as follows:

$$lny_{i,t} = lnA(0) + g_t + T_t + \frac{\alpha}{1-\alpha-\beta} ln(s_k) + \frac{\beta}{1-\alpha-\beta} ln(s_h) - \frac{\alpha+\beta}{1-\alpha-\beta} ln(\eta + g + \delta) \tag{8}$$

We assume that $ln\ A(0) = a + \varepsilon$, where a is a constant and ε is a country-specific shock. Therefore, the log per capita income at time t can be rewritten as

$$lny_{i,t} = a + g_t + T_{i,t} + \frac{\alpha}{1-\alpha-\beta} ln(s_k) + \frac{\beta}{1-\alpha-\beta} ln(s_h) - \frac{\alpha+\beta}{1-\alpha-\beta} ln(\eta + g + \delta) + \varepsilon_{i,t} \tag{9}$$

Finally, the theoretical growth equation capturing the dynamics toward the steady state, with some algebra, becomes:

$$lny_{i,t} = a + g_t + T_{i,t} + \frac{\alpha}{1-\alpha-\beta} ln(s_k) + \frac{\beta}{1-\alpha-\beta} ln(s_h) - \frac{\alpha+\beta}{1-\alpha-\beta} ln(\eta + g + \delta) + \varepsilon_{i,t} \tag{10}$$

Equation 10, thus, shows how the long-term income per capita is dependent on the accumulation of physical capital and human capital stock; a Harrod-neutral (or labor-augmenting) technological factor, expressed by the linear trend variables, g_t and T_t, and factors that enhance their efficiency—population growth. In this respect, Knight et al. (1993) argued that economic efficiency is greatly and positively affected by the degree of openness to international trade.

Importantly, the model uses the extent of trade openness promotion as a component of the technological shifting factor, not as a factor of production. It uses bilateral trade as an efficiency-enhancing variable under the assumption that it promotes the absorption and imitation of technology through learning by importing. That generates spillover effects from the world stock of knowledge. Lastly, the model does not assume that the economy is always in a steady state. Instead, it is assumed that the economy is close enough to the steady state that a linearization of the transition path is reasonable.

Ⅳ. Empirical analysis and results

Rearranging terms to get the change in the natural logarithm of output and referring to the usual additional assumptions in Mankiw et al. (1992), notably that countries do not differ in δ and g (as in Equation (8)), yield clear implications for the specification of a testable regression given by:

$$lny_{i,t}=\beta_0+\beta_1 lny_{i,t-1}+\beta_2 g_t+\beta_3 \ln(n_{i,t}+g+\delta)_t+\beta_{4ln} lns_{K,t}+\beta_{5ln} lns_{H,t} +\beta_6 X_{i,t}+\varphi_t+\mu_i+\varepsilon_{i,t} \quad (11)$$

where φ_t is the time-specific effects, μ_i represents the country-specific effects; X_t represents the control variables; β_0 through β_6, and are parameters to be estimated; and $\varepsilon_{i,t}$ is the error term under the i.i.d. $N(0, \sigma^2)$ assumption.

Moving to data consideration, the sample consists of 42 sub-Saharan African countries, which are listed in Table A1 in Appendix, and lists all interpersonal trust values for the included country observations in our dataset.

Data description and sources are presented in Table 1. As shown in Table 1, data on initial GDP and growth are based are drawn from the World Development Indicator Database 2022. Particularly, the initial stock of capital is proxied by the logarithm of GDP per capita of country i at the beginning of each period ($Y_{i,t-1}$, initial GDP per capita). The ratio of the total value of external trade (exports plus imports) to GDP is equivalent to trade openness. Tertiary education is used as the proxy for human capital. The rationale here is that the absorption of technology spillovers from imports requires high skills commonly accumulated through higher education. In addition to the key determinants of eco-

Table 1. Variables Description and Source

Variable	Description	Source
GDP per capita growth rate	Annual growth of GDP per capital	WDI; World Bank
Initial per capital GDP	GDP per capita at the initial year of data (2000)	WDI; World Bank
Log Trade Value	The log of trade value (sum of export and import with China, Hong Kong, Japan, North Korea, South Korea)	UN Comtrade
Log Export Value	The log of annual export value to the above countries	UN Comtrade
Log Import Value	The log of annual import value from the above countries	UN Comtrade
Labor force (% of total pop.)	The annual percentage of workers in total population	WDI; World Bank
G. fixed capital formation %	Gross fixed capital formation as a percentage of GDP	WDI; World Bank
Tertiary school enrollment %	Annual percentage of tertiary school enrollment	WDI; World Bank
Government expenditure %	Government consumption expenditure to GDP	WDI; World Bank
KOF fin. Globalization index	KOF financial globalization index (de facto and de jure)	KOF Globalization Index
Law and order	Effectiveness of the legal system (higher value is better)	Int. Country Risk Guide
Investment profile	Assessment of factors of investment (higher is better)	Int. Country Risk Guide

nomic growth discussed so far, pertinent control variables were recently identified in the literature (e.g., government expenditures, law and order, investment profile, globalization index, labor force, and investment profile) have been added *de facto* to the empirical regression model.

The descriptive statistics for the variables are presented in Table 2. One can see the average values of the variables considered in the study; notably, the mean of 1.48 for GDP per capita and 19.6% mean for trade. The mean for globalization index is quite higher at 46.4.

Based on Table 3 which shows all correlations are at low to moderate levels, we can assume that multicollinearity would not pose any problems for the fixed-effect estimations. Arguably, the impact of Asia's growth on growth in Africa can be quantified by estimating a fixed-effects panel regression, as in Islam (1995). The fixed-effects estimation with the use of a longer time period makes it possible to examine the time series dimension of the Africa's economic growth effect after controlling for other growth factors. It also allows other explanatory variables in the growth regression and testing of the robustness of the estimated growth impact.

Estimation results have been organized in terms of the two alternatives to African countries' bilateral trade with East Asia, namely "trade value" and "import value". The results from the alternative model using exports are not reported here since they are closely aligned with the results for the model with trade value. Moreover, results from fixed ef-

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP per capita growth rate	968	1.48	5.38	−47.59	56.79
Level of initial per capita GDP	945	1693.76	2151.57	262.03	11178.13
Log Trade Value	768	19.61	2.07	12.81	24.53
Log Export Value	736	17.49	3.09	5.89	24.25
Log Import Value	766	19.28	1.93	12.81	23.82
Labor force (% of total pop.)	987	45.06	5.92	28.41	55.33
Gross fixed capital formation %	852	21.7	9.21	1.1	81.02
Tertiary school enrollment %	560	8.3	7.58	.35	44.39
Government expenditure %	842	14.84	6.98	.95	54.8
KOF fin. Globalization index	940	46.47	12	21.24	86.74
Law and order	672	2.85	1.02	.5	6
Investment profile	672	7.14	1.81	1	11.5

Table 3. Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
GDP per capita growth rate	1.00											
Level of initial per capita GDP	−0.12	1.00										
Log Trade Value	−0.01	0.15	1.00									
Log Export Value	−0.06	0.22	0.87	1.00								
Log Import Value	0.04	0.04	0.96	0.76	1.00							
Labor force (% of total pop.)	0.17	−0.17	−0.08	−0.00	−0.11	1.00						
Gross fixed capital formation %	0.07	0.07	0.28	0.25	0.22	−0.05	1.00					
Tertiary school enrollment %	−0.10	0.67	0.45	0.44	0.40	−0.15	0.17	1.00				
Government expenditure %	−0.10	0.47	−0.15	−0.04	−0.22	0.09	0.03	0.36	1.00			
KOF fin. Globalization index	−0.07	0.47	−0.04	−0.00	−0.08	−0.05	0.05	0.35	0.37	1.00		
Law and order	0.18	0.09	−0.22	−0.17	−0.21	0.08	0.18	−0.04	0.13	0.15	1.00	
Investment profile	−0.12	0.40	−0.17	−0.12	−0.20	−0.14	0.08	0.19	0.23	0.40	0.21	1.00

fects estimations are presented in Tables 4 through 8 for both the full sample and the time-split version for robustness checks.

Overall, throughout the following tables, we can see that the coefficients for the standard determinants of economy, namely physical capital (proxy by gross fixed capital formation) and labor, are largely significant and correctly signed. The same observation can be seen for the coefficient of initial income. The coefficient of this variable is supposed to be negative and significant in the hypothesis of conditional convergence (Barro & Martin, 1995; Solow, 1956). Noticeably, the evidence provided here is that of a conditional convergence, which contradicts the absolute convergence predictions of the neoclassical growth model.

Importantly, the coefficient for trade is positive and significant at either the 1% or 10% significance level. This implies for instance that on average a 1 percentage point increase in the value of their bilateral trade with East Asia is associated with a 0.84 percentage point higher DDP per capita in African countries.

Surprisingly, the coefficient of human capital (tertiary education) turned out to be insignificant in all specifications in Table 4. Overall, except for government expenditure, most of our control variables, namely, globalization, rule of law, and investment profile, are signifi-

Table 4. Fixed Effect: Trade Value

	(1) △ GDPPC	(2) △ GDPPC	(3) △ GDPPC	(4) △ GDPPC	(5) △ GDPPC	(6) △ GDPPC
Initial per capita GDP	−.026 (.01)	−.03*** (.01)	−.02** (.01)	−.02** (.01)	−.05*** (.01)	−.04*** (.01)
Log Trade Value	.74 (.47)	.84** (.38)	.71* (.35)	.72* (.35)	1.28*** (.37)	1.44*** (.32)
Labor force %	.46** (.21)	.49** (.18)	.44** (.19)	.43** (.2)	.48** (.17)	.36** (.16)
GFCF %	.09** (.04)	.14*** (.02)	.14*** (.02)	.12*** (.02)	.11*** (.04)	.11*** (.03)
Tertiary Educ		.14 (.09)	.13 (.09)	.11 (.08)	.02 (.18)	.02 (.18)
Govt Expenditure			−.07 (.05)	−.05 (.06)	−.05 (.07)	−.03 (.07)
Fin. Globalization				.03 (.02)	.1** (.04)	.09* (.05)
Law and Order					3.09*** (.6)	
Investment profile						.64* (.36)
No. of Obs.	665	429	422	411	277	277
No. of countries	40	39	39	39	29	29
R-squared	.15	.21	.22	.14	.21	.21
Country FE	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES

*Standard errors are in parentheses; ***p<.01, ** p<.05, * p<.1*

cant and positively signed. Interesting to note, with the inclusion of these significant control variables, both the coefficient and the speed of convergence became relatively higher.

Turning to Table 5, which uses import values instead of total trade, it can be seen that the coefficients of interests are significant and positively signed. Particularly, the coefficient of imports is highly significant in all regressions and suggests a stronger impact on economic growth of African countries, compared to the impact of total trade in Table 4. This could be interpreted to suggest that imports of capital goods (which represent much of the African imports from East Asia) represent a channel of technology progress. This interpretation is line with Ismail (2008) and Maswana (2015). Also, it is apparent from Table 5 that the speed of convergence among sample countries is relatively faster compared to those in the model involving total trade value as presented in Table 4. What is interesting in this result is that the highest coefficient of imports is found in Colum 5, which also has a significant coefficient (5% significance level) of human capital and that of law and order (1% significance level).

The regression results indicate that there is a significant positive relationship between per capita income of Africa's trade with Asia as the economic importance of Asia keeps growing over time. This finding agrees with Rodriguez and Rodrik (2000) in that developing countries receive more benefits by trading with countries whose level of development

Table 5. Fixed Effect: Import Value

	(1) △ GDPPC	(2) △ GDPPC	(3) △ GDPPC	(4) △ GDPPC	(5) △ GDPPC	(6) △ GDPPC
Initial per capita GDP	−.03** (.01)	−.03*** (.01)	−.03*** (.01)	−.03*** (.01)	−.05*** (.01)	−.04*** (.01)
Log Import Value	1.18* (.59)	1.1** (.42)	.95** (.39)	.92** (.39)	1.48*** (.42)	1.35*** (.37)
Lab force %	.52** (.21)	.53*** (.17)	.47** (.19)	.46** (.19)	.53*** (.18)	.41** (.17)
GFCF %	.07** (.03)	.13*** (.02)	.13*** (.02)	.12*** (.02)	.1*** (.03)	.1*** (.03)
Tertiary Educ		.14 (.09)	.13 (.09)	.1 (.08)	0.23** (.18)	.016* (.18)
Govt Expenditure			−.08 (.05)	−.05 (.06)	−.05 (.07)	−.04 (.07)
Fin. Globalization				.03 (.02)	.09* (.05)	.08 (.05)
Law and Order					3.13*** (.58)	
Investment profile						.57 (.36)
No. of Obs.	663	428	421	410	276	276
No. of countries	40	39	39	39	29	29
R-squared	.16	.22	.23	.15	.21	.2
Country FE	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES

*Standard errors are in parentheses; ***p<.01, **p<.05, *p<.1*

is higher than theirs, which ultimately ensures growth convergence within and between groups. One last note is the unanticipated finding is that the proxy for human capital was mostly insignificant. A possible explanation for this might be that the local absorptive capacity in most African countries remains lower than the minimum required for trade-induced technology from East Asia.

Turning now to the robustness checks, we split the sample into two sub-periods, namely 2000–2010 and 2011 to 2020 to test whether the effect will differ across these time periods. Tables 6 through 9 present the estimation results. Particularly, compared with the coefficient estimates in previous tables, we see that the effect of trade value or that of imports on economic growth remains significant. However, the effect of trade is slightly larger in the post-2010 period (almost 0.7% point, as seen in Column (6) in Tables 6 and 7). However, the coefficient estimates for control variables in the post-2010 (Table 7) become insignificant; nevertheless, they still have positive signs.

Like the previous results of the trade-based robustness checks, those by imports before and after 2010, mostly confirm the confidence we can accord to our panel estimations. We see that the positive relationship between imports-growth holds for both periods. Lastly, we can also see that most control variables still maintain their relevance (especially in Table 8), as in the full sample. However, as it can be seen in Table 8, except for the coefficient

Table 6. Fixed Effect Up to 2010: Trade Value

	(1) △ GDPPC	(2) △ GDPPC	(3) △ GDPPC	(4) △ GDPPC	(5) △ GDPPC	(6) △ GDPPC
Initial per capita GDP	−.01** (.01)	−.03** (.01)	−.02** (.02)	−.02*** (.02)	−.04** (.01)	−.06** (.02)
Log Trade Value	.23 (.46)	.67** (.48)	.67** (.48)	.76*** (.45)	1.3** (.46)	1.53** (.49)
Lab force %	.1 (.42)	.52** (.34)	.43*** (.34)	.25** (.34)	.36** (.24)	.59** (.33)
GFCF %	.03* (.05)	.09** (.07)	.09** (.07)	.06** (.08)	.04*** (.14)	.08** (.14)
Tertiary Educ		−.32** (.11)	−.29** (.1)	−.43*** (.12)	−.31 (.25)	−.26 (.24)
Govt Expenditure			−.07 (.11)	−.02 (.11)	−.02 (.12)	−.07 (.12)
Fin. Globalization				.14** (.05)	.11 (.14)	.13 (.13)
Law and Order					2.97*** (.79)	
Investment profile						1.57*** (.48)
No. of Obs.	331	202	198	198	126	126
No. of countries	37	33	32	32	23	23
R-squared	.06	.17	.17	.19	.3	.34

*Standard errors are in parentheses; ***p<.01, **p<.05, *p<.1*

Table 7. Fixed Effect Post 2010: Trade Value

	(1) △ GDPPC	(2) △ GDPPC	(3) △ GDPPC	(4) △ GDPPC	(5) △ GDPPC	(6) △ GDPPC
Initial per capita GDP	−.07*** (.02)	−.06** (.02)	−.04*** (.01)	−.05*** (.01)	−.06*** (.01)	−.06*** (.01)
Log Trade Value	2.56* (1.24)	1.79* (.86)	1.22 (.91)	.93 (.7)	2.23** (.77)	2.26** (.76)
Lab force %	.69* (.31)	.92 (.6)	.74* (.35)	.96*** (.28)	.72** (.27)	.71** (.27)
GFCF %	.12 (.08)	.16*** (.05)	.15*** (.04)	.14*** (.04)	.1* (.05)	.1* (.05)
Tertiary Educ		−.21 (.3)	−.33 (.29)	−.3 (.29)	−.25 (.44)	−.26 (.42)
Govt Expenditure			−.06 (.15)	.02 (.12)	.01 (.17)	.01 (.15)
Fin. Globalization				.12* (.05)	.12 (.07)	.12 (.07)
Law and Order					.5 (1.06)	
Investment profile						0 (.39)
No. of Obs.	334	227	224	213	151	151
No. of countries	37	36	36	36	26	26
R-squared	.26	.33	.35	.21	.22	.22

*Standard errors are in parentheses; ***p<.01, **p<.05, *p<.1*

Table 8. Fixed Effect Up to 2010: Import Value

	(3) △ GDPPC	(4) △ GDPPC	(5) △ GDPPC	(6) △ GDPPC	(7) △ GDPPC	(8) △ GDPPC
Initial per capita GDP	−.02 (.02)	−.04** (.02)	−.03* (.02)	−.03* (.02)	−.05*** (.01)	−.06*** (.02)
Log Import Value	1.13* (.52)	1.43** (.58)	1.45** (.59)	1.5** (.55)	1.72** (.59)	1.87*** (.49)
Female lab force %	.23 (.45)	.6* (.32)	.51 (.32)	.33 (.32)	.39 (.24)	.62* (.32)
GFCF %	.02 (.05)	.08 (.07)	.08 (.07)	.05 (.08)	.03 (.14)	.07 (.14)
Tertiary Educ		−.31** (.11)	−.28** (.1)	−.42*** (.13)	−.29 (.24)	−.24 (.23)
Govt Expenditure			−.06 (.11)	−.02 (.11)	−.04 (.12)	−.08 (.12)
Fin. Globalization				.14** (.05)	.1 (.14)	.13 (.13)
Law and Order					2.71** (.86)	
Investment profile						1.46** (.5)
No. of Obs.	329	201	197	197	125	125
No. of countries	37	33	32	32	23	23
R-squared	.08	.2	.2	.22	.32	.35

*Standard errors are in parentheses; ***p<.01, **p<.05, *p<.1*

of globalization, the rest of the control variables become insignificant. This could be interpreted to suggest that the impacts of imports from East-Asia on economic growth of Africa might have made irrelevant the effects of institutional factors in the process as African countries became more open to globalization.

Another significant finding worth highlighting here is that imports from East-Asia alone might be the most important channel through which both regions under investigation influence economic development in Africa. This influence of imports has grown even stronger as globalization proceeds. This can be seen as on average the magnitude of imports coefficient becomes larger in post-2010 period (Tables 8 and 9). Although there is no direct evidence, it can be inferred that not only what countries trade matter (see, Hausmann et al., 2007) but also with whom they trade do matter.

All in all, our findings suggest that the ongoing global economic shift towards China and the rest of East Asia has significant impacts in developing countries such as those in sub-Saharan Africa. Nevertheless, despite our effort in conducting this study, some limitations should be admitted. First, the bilateral total trade value, measured by imports plus exports and commonly used in empirical research (e.g., Levine & Renelt, 1992), was used in this present study. This measure is sometimes criticized because it only considers the volume of trade and disregards the nature of trade policies in a given country. Second, too much short-term volatility in the time series for exports of primary commodities in which most

Table 9. Fixed Effect After 2010: Import Value

	(1) △ GDPPC	(2) △ GDPPC	(3) △ GDPPC	(4) △ GDPPC	(5) △ GDPPC	(6) △ GDPPC
Initial per capita GDP	−.06**	−.06***	−.04***	−.05***	−.07***	−.07***
	(.02)	(.02)	(.01)	(.01)	(.01)	(.01)
Log Import Value	1.79	1.72**	1.02	.99**	2***	2.06***
	(1.52)	(.6)	(.59)	(.41)	(.55)	(.57)
Lab force %	.86**	1.1*	.87**	1.08***	1.03***	1.03***
	(.31)	(.59)	(.35)	(.27)	(.28)	(.3)
GFCF %	.08	.16***	.15***	.14***	.1**	.1**
	(.06)	(.04)	(.04)	(.03)	(.03)	(.04)
Tertiary Educ		−.18	−.32	−.28	−.21	−.21
		(.31)	(.3)	(.3)	(.46)	(.45)
Govt Expenditure			−.06	.02	0	0
			(.15)	(.12)	(.16)	(.14)
Fin. Globalization				.12*	.12*	.13*
				(.05)	(.07)	(.07)
Law and Order					.53	
					(.85)	
Investment profile						−.05
						(.4)
No. of Obs.	334	227	224	213	151	151
No. of countries	37	36	36	36	26	26
R-squared	.24	.33	.35	.21	.21	.21

*Standard errors are in parentheses; ***p<.01, **p<.05, *p<.1*

African countries are specialized can be a drawback of using panel data. Although this problem could have been avoided by using multi-year averages, we did not use these data for technical convenience. Despite these points, our empirical results corroborate those in previous studies.

V. Concluding remarks

This paper has given an account of the contribution of East-Asia-Africa bilateral trade on economic growth of African countries using a panel fixed-effect regression. One of the more significant findings to emerge from this study is that the ongoing global economic shift towards China and the rest of East Asia has significant impacts in developing countries such as those in sub-Saharan Africa. The second major finding is that not only what African countries trade matter but also their bilateral trade interactions with East Asian economies do also matter.

Another finding worth mentioning is that the local absorptive capacity in most African countries might have remained below the minimum required for trade-induced technology spillovers from East Asia. Although the empirical evidence pertains to some growth potentials for African countries resulting from their trade interactions with East-Asia, it is im-

perative that human capital in Africa be further supported to fully materialize the trade potentials.

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Appendix

Table A1. List of Countries

Angola	Kenya
Benin	Lesotho
Botswana	Madagascar
Burkina Faso	Malawi
Burundi	Mali
Cabo Verde	Mauritania
Cameroon	Mauritius
Central African Republic	Mozambique
Comoros	Namibia
Congo, Dem. Rep.	Niger
Congo, Rep.	Nigeria
Cote d'Ivoire	Rwanda
Eritrea	Senegal
Eswatini	Seychelles
Ethiopia	Sierra Leone
Gabon	South Africa
Gambia, The	Sudan
Ghana	Tanzania
Guinea	Togo
Guinea-Bissau	Uganda
Zimbabwe	Zambia