Growth by Destination: The Role of Trade in Africa's Recent Growth Episode.

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Abstract

Over the period 1990–2009, Africa has experienced a distinct reversal in its growth fortunes, in stark contrast to its performance in the preceding decades. This paper presents both cross-country and panel-data evidence of the causal factors driving the turnaround in Africa's growth and takes the unique approach of examining the separate growth impacts of Africa's trade with China, Europe and America. We show that although Africa's bilateral trade with China has been a key factor spurring growth on the continent, foreign direct investment and private sector investment are, in relative terms, even more important determinants. On the other hand, foreign aid and bilateral trade openness to Europe are found to have growth-reducing effects, while Africa-US trade has no statistically significant impacts. These results are robust across numerous specifications and persist even after carefully accounting for endogeneity between trade and growth.

1. Introduction

The idea that trade openness is an important causal, contributing factor towards the promotion of economic development and growth has for long been debated by economists and policy makers. Since Ricardo's critique of the Corn Laws in the early 1800s, the debate has not waned. The key argument for free trade, as proposed by Ricardo and dating at least as far back as Adam Smith, is that nations could improve their income and long run growth rate by specializing in the export of goods and services in which they have a comparative advantage. Within nations, resources are more efficiently allocated, output is increased and feasible sets of consumption possibilities are expanded, leading to static gains from trade. Modern trade theories such as those propounded by Helpman and Krugman (1985) and Romer (1986) emphasize the dynamic gains from trade that constantly shift countries' production possibility frontiers outwards. Greater trade openness encourages private entrepreneurship, attracts foreign investment, fosters learning by doing, and encourages acquisition of knowledge and new technologies thus leading to increased productivity and economic growth[1].

Outward oriented and export-led growth policies implemented in the 1960s and 1970s have hailed success in many East Asian countries and contributed to their rapid economic growth over the past three decades. Through greater exposure to international markets, these countries became increasingly competitive and integrated into the global economy, making a swift move from exports of raw materials to one involving more dynamic high technology products (Hammouda, 2004). The African experience, however, has been bleak. Following the failure of inward-looking trade policies implemented in the 1960s and early 1970s, many African nations turned to greater external openness (Hammouda, 2004). Unlike their East Asian counterparts, they continued to experience sluggish growth and became increasingly marginalised in the 1980s. Africa, then tagged the "hopeless continent"[2], registered negative real GDP per-capita growth rate, averaging 0.8% per annum over the 1980 decade. This is portrayed in *Figure 1* which further highlights the relatively sub-par growth performance of Africa until the 1990's. By this time, as displayed in *Figure 2*, the region was surpassed by Asia in terms of real GDP per capita, a rough proxy of average living standards.

The fact that Africa continued to lag behind other regions despite comprehensive trade reforms and other efforts to emulate export-led growth models prompted researchers to reconsider the trade-growth relationship. Many studies subsequently highlighted the contingent aspect of the trade-growth link, implying that trade openness would lead to growth only if appropriate economic, social, institutional and political conditions are in place (Dufrenot et.al., 2010). These include factors like governance, policies, bureaucracy, competition (Dollar and Kraay, 2003; North, 1990) and growth of inputs such as capital, labour, education and infrastructure (Krugman, 1990).

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[1] The growth-enhancing effect of trade openness is supported by a large body of literature (e.g. Ben-David, 1993; Bhagwati and Srinivasan, 2002; Dollar, 1992; Dollar and Kraay, 2001; Edwards, 1998; Frankel and Romer, 1999; Sachs and Warner, 1995; Wacziarg, 2001).
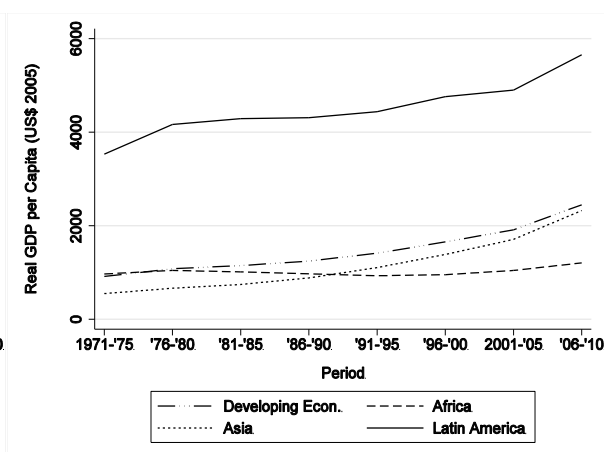
[2] "The Hopeless Continent" was the title of the published version of the The Economist, 13 May 2000.

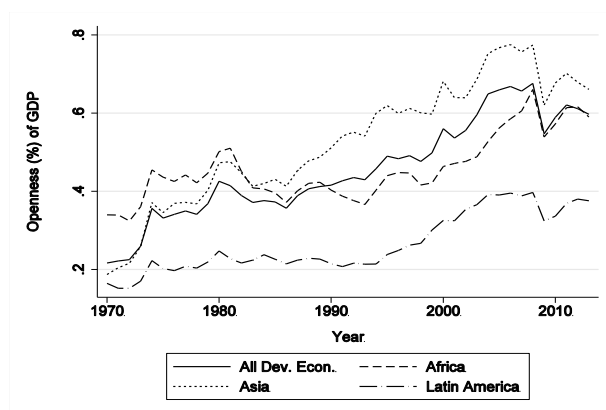**Figure 1. Trends in Real Growth per Capita by Region (5 year averages)**
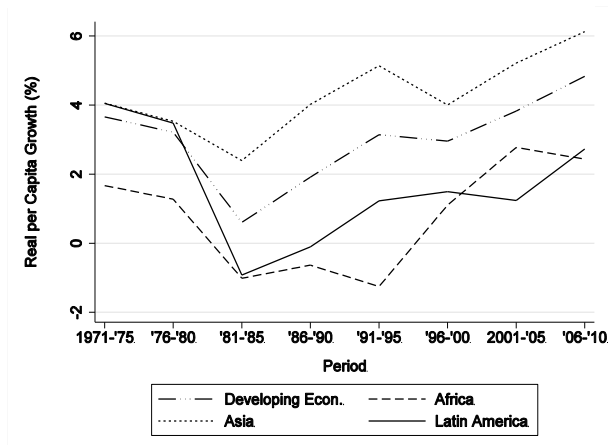
Source:UNCTAD

Figure 2. Trends in Real GDP per Capita by Region

Source:UNCTAD

Figure 3: Regional Openness 1970 -2010

Source:UNCTAD

The pro-growth trade arguments can, therefore, be rebutted if market and institutional imperfections prevail, which may cause openness to induce: i) the underutilization of human and physical capital and natural resources, ii) the concentration of economic production in extractive economic activities or iii) specialization away from technologically advanced, increasing return sectors. Endogenous growth models presented by Eicher (1999), Grossman and Helpman (1991); Lee (1993) and Young (1991) emphasize these more pessimistic possibilities[3].

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[3] In Grossman and Helpman (1991) and Matsuyama (1992) a country may specialize in a non-dynamic sector as a result of openness, thus losing out on the long-run benefits of increasing returns. These models generally include imperfections in financial markets or imperfections in contracts that induce people to follow a limited notion of static comparative advantage. Sachs and Warner (1995, 1999) introduce a model where specialization and trade is extractive. Natural resource sectors divert the economy's resources from achieving technological progress, the key to growth in the long-run. In this case, the underlying imperfection is an institutional weakness that encourages natural resource depletion for quick gains, which are subsequently appropriated away by certain groups in society. Rodriguez and Rodrik (2001) review the theoretical arguments as to why openness can be detrimental to developing countries.

Mid-1990s marked the beginning of a positive reversal in Africa's growth fortunes. In real GDP per capita growth terms, Africa made a noticeable leap from the negative territories to a more reassuring 2% average rate per annum *(Figure 1).* In the first decade of the 21st century, real GDP growth jumped to 5% per annum on average, proving resilient throughout the turbulent mid-2000s, even outstripping that of the EU and the US.

The literature on African growth identifies boom in commodity prices as the driver of the region's recent economic take-off. This explanation, however, loses its appeal in face of evidence that many non-resource dependent countries have also made remarkable strides in economic growth (AfDB, 2012), suggesting that growth in Africa stands on a more diversified base, with sectors other than natural resources gaining importance (McKay, 2013). Researchers also concur that countries across the continent have made significant improvements in macroeconomic management, strengthening of political institutions, investment in physical and human capital and opening up domestic markets to international trade (AfDB, 2012; Rodrik, 2014). Trade as a share of GDP increased from a trough of less than 40% in 1993 to a peak exceeding 60% by 2007, as shown in *Figure 3*. Notably, during the turbulent years of the global financial crisis, the share dropped only slightly and subsequently rebounded in early 2010, showing that Africa's trade remained fairly resilient despite significant external shocks. Exports from African countries expanded annually by an average of 15% during the 2000-2010 period, outstripping the world average of 9.7% and almost doubling the 8% rate in the 1990s. At the same time, African imports grew by 17% per annum on average over the same period.

Beneath the surface of the perceptible stability in Africa's trade flows was a significant shift in the structure of Africa's trade by trading partner. Conclusive evidence of this is provided in *Figure 4.*

Figure 4: African Countries' Trade Shares by Major Trading Partners
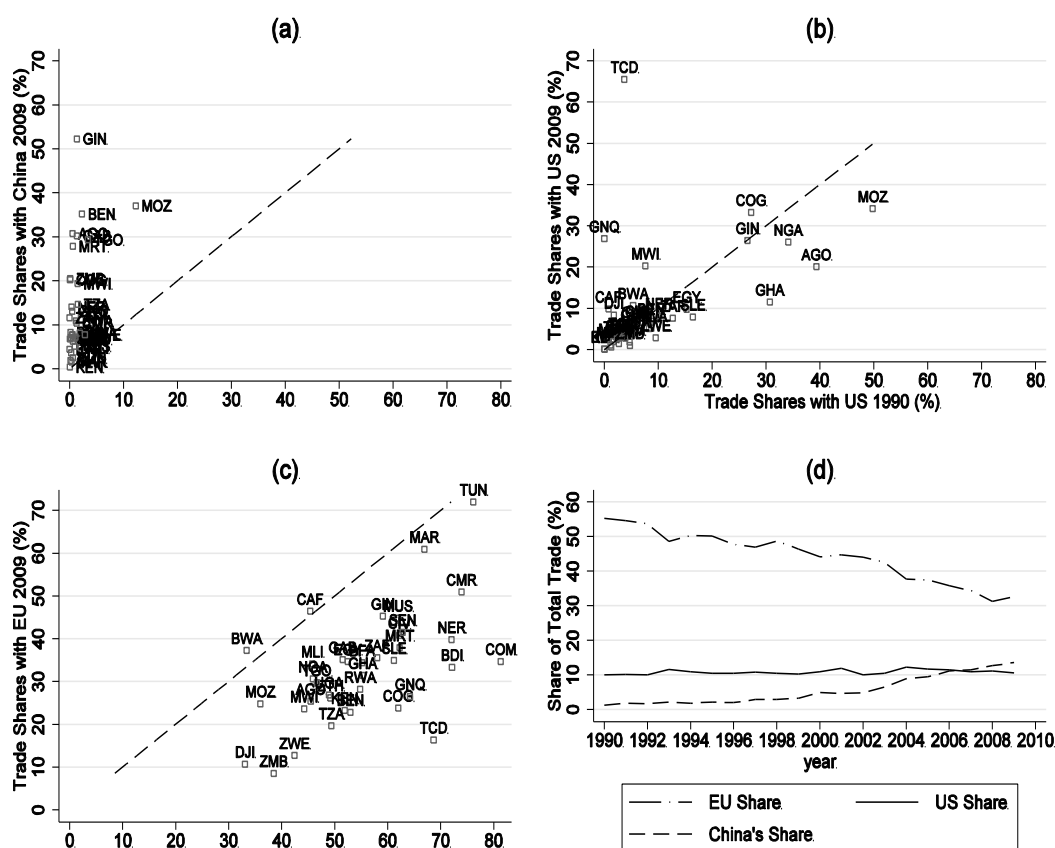
(a) Individual Country Trade Shares with China 1990 and 2009 (b) Individual Country Trade Shares with US 1990 and 2009
(c) Individual Country Trade Shares with EU 1990 and 2009 (d) Individual Country Trade Shares
Source: IMF

The first three panels of the figure plot individual African country's trade share by major trading partner, namely China, US and EU for two years 1990 (beginning period) and 2009 (final period). Any African country which has maintained exactly the same trade share in 1990 and 2009 with a major trading partner will be located on the 45 degree line. Conversely, African countries falling further away from the 45 degree reference line have experienced larger deviations in their trade shares between 1990 and 2009 with the major trading partner.

In *panel (a)*, the cluster of points near the *x*-axis highlights the fact that China's trade penetration in Africa was relatively low in the early 1990's. By the end of the period, however, there appears to have been a marked increase in China's share of trade with most African countries within the dataset, as most trade shares lie above the 45 degree reference line. The greatest inroads appear to have been made in countries such as Guinea, Benin, Mozambique, Angola and Gabon. *Panel (b)*, which displays bilateral trade shares between African countries and the US, show mixed results: the reference line approximately splits the sample in half, with most points remaining very close to the reference line. This implies that bilateral trade remained relatively stable between Africa and US between 1990 and 2009. The most significant increases in trade shares with the US, over the period, occurred in countries such as Chad, Equatorial Guinea and Malawi. Noticeable declines in

trade shares appear in Ghana, Angola and Mozambique. It is interesting that China has made inroads into the latter two countries implying competition for markets between major trading partners and a possible direct pivot away from America towards China in trading ties and allegiances. *Panel (c)* brings into stark relief the significant decline in Europe's bilateral trade shares across the board with all African countries except Central African Republic and Botswana between 1990 and 2009. The largest declines in trade shares were observed in Chad, Comoros, Burundi, Republic of the Congo and Equatorial Guinea. *Panel (d)* depicts a times series of trade shares of the three major trading partners with Africa over the period. It underlines the secular decline in bilateral trade share between Europe, the relatively stability and slight increase in US-African trade and the ten-fold rise of China's trade share with Africa since 1990. The panel also reveals that by 2007 China had overtaken the US as an important trading partner for Africa.

The remarkable coincidence of the reversal of Africa's poor growth outcomes since mid-1990's with its increased openness to China during that same period has re-ignited the debate regarding the role of trade in stimulating growth. Recent studies by the International Monetary Fund, such as Drummond and Liu (2013), point out that China's recent domestic investment, which increased from 34% to 46% over the period 2000-2012, has fuelled its demand for minerals, farm products, timber and oil from all over the world including Sub-Saharan Africa (SSA) and is now the latter's single, largest trading partner. Their study concludes that a 1% increase (decline) in China's domestic investment leads to 0.6% increase (decline) in SSA's export growth with a larger impact for resource-rich countries especially oil-exporters. IMF (2011) concludes that "the increasing role of China in SSA reflects China's increasing share as a major player in world trade and its historic re-orientation toward new markets".

It is worth noting that China's intensified relationship with Africa over the period of interest has occurred despite the existence of major bilateral agreements between Africa and its other major trading partners, Europe and America. Africa shares a longstanding relationship with the European Union, dating back to 1957 with the Treaty of Rome. The Lomé Convention signed in 1975 and its successive rounds offered African, Caribbean and Pacific countries (ACP) generous unilateral preferential access to EU markets. Deemed as a breach of WTO 'most-favoured nation' principle, the convention was replaced by the Cotonou Agreement in 2000, which sets the ground for progressive reciprocal but asymmetric market access, where the EU provides full, duty free market access to ACP countries that ratify Economic Partnership Agreements (EPAs) and the latter commit to progressively open their markets to EU (Ramdoo and Bilal, 2014). Meanwhile, to assist the integration of all least developed countries into the global economy, the EU launched the "Everything but Arms" (EBA) initiative in 2001. This arrangement, initially offered to 33 African countries (among other countries from Asia and the Pacific and the Caribbean), has been designed to meet the needs of least developed countries and grant full duty free and quota-free access to the EU for all their exports with the exception of arms and armaments. At the heart of US-African engagement on trade lies the African Growth and Opportunity Act (AGOA) passed by the US congress in 2000 to further trade relations between the US and Sub-Saharan African. This trade preference program, combined with the US Generalized System of Preferences, grant duty free export access, subject to eligibility requirements, to nearly 6400 product lines coming from 39 countries in Africa (UNECA, 2013) in return for structural reforms.

China's engagement with Africa, initially based on diplomatic and political links, entered a new phase following China's opening up in 1978. Due to limited strength of Chinese businesses in the 1980s, there was heavy reliance on state-sponsored smaller projects to penetrate African markets (Chun 2013). In the 1990s, China's presence in Africa intensified with stronger bilateral trade and heightened investment by Chinese enterprises, particularly large SOEs that contributed towards improving investment environment through aid-funded infrastructure projects on the continent. The more recent phase of involvement entails a growing number of small and medium sized private enterprises (Kaplinsky et al., 2009). The Sino-African ties were further consolidated with the establishment of the Forum on China-African Cooperation (FOCAC), providing a platform for new and mutually beneficial cooperation based on reciprocal respect, support and learning. Broadman (2007) highlights the positive impacts of these agreements on Africa's manufacturing export growth (and the insignificant effect on agricultural export growth).

Taken together, these important developments intensify interest in understanding whether Africa's trade with these regions has impacted on its growth. A recent paper by Baliamoune-Lutz (2011) highlights the "growth by destination hypothesis" by distinguishing between effects of African imports from and exports to China, while controlling for export concentration and openness to trade. Baliamoune-Lutz (2011) suggests that while exports to China do not affect growth unconditionally, export concentration enhances the growth effects, implying that countries exporting one major product to China benefit more (in growth terms) than those that are more diversified. Exports to developed countries (defined as rest of the world, excluding China and Africa) on the other hand, are linked through an inverted-U relationship while imports from China were found to have growth-enhancing effects, providing support to the hypothesis that "where you export matters for economic growth".

We analyse the same hypothesis, albeit, from a different angle. We exploit panel data techniques and, in a unique contribution to the literature, separately estimate the effects of bilateral trade on African growth for each of its major trading partners (Europe, China and US). In so doing, we shed further light on the trade openness-growth nexus when destination of trade is taken into account and add to the discussion of sources of Africa's recently renewed economic growth. We focus on the 1990-2009 period to capture the major developments outlined above.

The paper is organised as follows. *Section 2* outlines the empirical strategy which specifies an appropriate model and estimation method. *Section 3* describes various datasets which are combined for utilization in the estimation of the prescribed models. *Section 4* summarizes the findings and discusses the empirical results. *Section 5* discusses the empirical results within the context of the existing body of literature. Finally, *section 6* concludes and offers some policy implications.

2. Empirical Strategy

Establishing the empirical relationship between trade openness and growth is fraught with challenges. Chang et al. (2009) remarks: "the theoretical ambiguity in models relating trade to economic growth is also reflected in the empirical evidence". On the one hand, influential papers by Dollar (1992), Edwards (1998), Frankel and Romer (1999), Sachs and Warner (1995) point to

strongly positive effects. Lee et al. (2004) point to small positive effects. On the other hand, Harrison (1996), Loayza et al. (2005) and Rodriguez and Rodrik (2001) have cast some doubt on the robustness of these results, citing econometric issues such as omitted variable bias and joint endogeneity bias.

To a certain degree, these studies have sought to address the concerns of such critics by employing more sophisticated econometric techniques such as generalized method of moments (GMM) methods to investigate effects of trade on growth. In fact, many recent papers modelling economic growth have adopted the GMM method for the empirical investigation. As Roodman (2009a and 2009b) point out, this method is not without its pitfalls. Moreover, it is well known that including time invariant variables among the regressors in such models can lead to econometric shortcomings such as the 'weak instruments problem'. We avoid these difficulties with the use of two-stage least squares approach. It is noteworthy however that, yet other estimation methodologies have been employed in the literature in order to estimate the effect of trade on economic growth. For example, Wacziarg and Welch (2003) use event study methodologies to investigate the issue. The findings from their paper suggest that liberalizing countries to international trade tend to have higher growth rates.

2.1 General Model

This paper adopts an empirical model of economic growth in Africa, along the lines of Mankiw et al. (1992), using key variables identified in the literature such as institutions, trade openness, conflict, private sector investment, financial stability, foreign aid and foreign direct investment. It employs a multipronged approach in investigating the relationship between trade and economic growth in Africa by estimating a static model of economic growth for 37 African countries[4], listed in *Table 1*. For this study, we exploit panel data techniques and estimate separate effects of bilateral trade with Europe, China and US on African real per capita growth. This is achieved by including separately within our regressions, proxies of bilateral trade openness with each of the three (aforementioned) major trading partners.

In order to accomplish this task, we entertain a model of the most general form, written as follows:

$$Growth_{it} = \beta_0 + \beta_1 initGDP_i + \beta_2 TO\_CH_{i,t} + \beta_3 TO\_EU_{i,t} + \beta_4 TO\_US_{i,t} + \beta_5' CV_{i,t} \quad (1)$$
$$+ \mu_t + \eta_i + \varepsilon_{i,t}$$

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[4] For another example of a static panel data model investigating economic growth in Africa 1980-2009, see Chang and Mendy (2012). These authors find that there is a strongly positive effect of trade on economic growth in Africa. They, however, find that the effect of savings on growth is negative and also find mixed results for FDI and AID. Brückner and Lederman (2012) were also able to identify significantly positive effects of trade on economic growth in Sub-Saharan Africa 1979-2009. Their study supports endogeniety between trade and growth in Sub-Saharan Africa and the limited (to no statistical) effect of ethnic polarisation and ethnic fractionalisation in affecting growth outcomes on the continent. Baliomoune-Lutz (2011) exemplifies a dynamic panel approach. She finds that investment (as measured by gross fixed capital formation to GDP), and imports from China both have a robustly positive effect on economic growth in Africa.

In *equation (1)*, the subscripts i and t represent country and time period respectively. The dependent variable *Growth* is the logged difference of real GDP per capita, *initGDP* represents the logged value of 1990 real GDP per capita for each country within the sample. The variables *TO_CH*, *TO_EU* and *TO_US* measure the bilateral trade openness of each African country with the major trading partners China, the EU, and US respectively. The trade openness measure employed for the analysis in this paper is the standard measure used in similar studies, such as Edwards (1992, 1998)[5] and Frankel and Romer (1999). Trade openness is measured as the sum total of imports and exports divided by GDP within a given time period for a given country.

The term *CV* in *equation (1)* represents all other control variables which are included in order control for the effect of trade on growth. The choice of variables for inclusion under *CV* pays due attention to two key considerations: 1) their importance in the theoretical and empirical literature as determinants of economic growth and 2) their potential for affecting the degree of trade openness.

The control variables used to estimate *equation (1)* are both time-varying and time-invariant in nature. Key time varying regressors included within our specification are i) *private sector investment to GDP* ratio, (ii) *foreign direct investment (FDI) to GDP* ratio and ii) *AID to GDP* ratio. The role of private sector investment in furthering economic growth has been captured by Romer's (1986) endogenous growth model. The model assumes that private investment positively contributes to technological change, ensuring increasing returns to scale and growth in the steady-state. Foreign direct investment is included although previous empirical studies have found ambiguous effects of FDI on economic growth (Alfaro et al, 2010; Chang and Mendy, 2012; Cipollina et al, 2012; Görg and Greenaway, 2004; Hanson 2001). Foreign aid is included as an independent variable since there is some empirical evidence that aid has a bearing on growth outcomes in Africa (see for example Burnside and Dollar, 2012; Brückner, 2013; Rajan and Subramian, 2011). We also include *inflation* as a simple proxy of financial stability. Following Chang et al. (2009), we calculate this variable as the absolute deviation of the inflation rate from 3% in logs. The time–invariant control variables are *oilprod-* a binary indicator variable which takes a value of 1 for oil- producing African countries and the geographic location binary indicator which indicates whether the country in question is located in *North*, *South*, *East*, *West* or *Middle Africa*. South Africa is adopted as the base category for the subsequent analysis.

Our specification also contains a *conflict* binary indicator, which varies across both country and time and indicates years in which there was a conflict within the African country in question. To capture the degree of institutionalized democracy (autocracy or democracy) within each African country, we use the *polity2* measure. Increases in *polity2* imply an increase in institutionalized democracy over the sample period. This variable measures the extent to which the country in question is democratic or autocratic with a higher score representing the democracy. This variable also varies by country and over time.

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[5] This measure has been criticized in the literature for its failure to take into account trade intensity in the non-tradeable goods sector. See for example (Alcala´ and Ciconne, 2004). However, this variable is sufficient for our purposes.

Unless otherwise stated, binary year indicator variables are employed in all regressions and robust standard errors clustered at the country level are utilized in order to make our statistical inferences and the conclusions drawn from the model robust to heteroscedasticity and autocorrelation within the dataset.

2.2 Estimation Strategy

We pursue a static model to explore the relationship between the variables of interest. The analysis has been carried out in stages, making it possible to test, at each stage the underlying assumptions made regarding the data which are imposed by the various estimation techniques applied. Firstly, pooled-OLS regressions are estimated. The use of pooled-OLS estimator assumes away heterogeneity within the panel of African countries. In particular, this approach serves as a baseline and restricts the coefficients on all countries to be the same. To account for heterogeneity among African countries in the dataset, we then move on to obtain fixed effect panel data estimates of the model for the sample period 1990-2009. The choice of the fixed effect panel data model is justified by a various versions of the Hausman and Taylor (1981) tests on panel data.

The fixed effect procedure, however, ignores endogeneity among regressors included within the model. It is important to note that while we explicitly include in *equation (1)* measures of trade openness for bilateral trade with EU, USA and China, the specification does not ignore the potential role and impact of bilateral trade with other countries in driving real per-capita growth within the sampled African countries. In fact, the omitted and unspecified bilateral trade-openness and all other omitted variables are jointly accounted for, although indirectly, through the inclusion of the intercept term $\beta_0 + \eta_i$. Therefore, factors such as trade with other partners, historical, cultural and geographical factors not explicitly modelled are allowed to shift the estimated, country-specific function for each country within the sample.

In order to address the endogeneity between trade openness and economic growth within the static estimation environment, we employ two strategies (i) a two stage least squares approach and (ii) the Hausman-Taylor (HT) estimator, an instrumental variables estimator, to overcome the problem of inconsistency caused by correlation between the country-specific random effects and some of the explanatory variables (Woolridge, 2010). Employing both methods allows for an essential robustness check on the statistical inferences from the econometric analysis. Altogether, our estimation strategy ensures that both cross-section and time series dimensions of the panel dataset are exploited and allows for the maximal use of the information contained within the data.

To implement the two-stage regression approach, we estimate each of the following first stage regressions following the approach taken by Brückner and Lederman (2012)[6]:

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[6] Barrios et al. (2010), Brückner and Ciccone (2011) and Miguel et al. (2004) exemplify this approach. Barrios et al (2010) show that rainfall's significant effect on GDP is limited to the group of sub-Saharan African countries and in other regions such as Asia and Latin America there is no significant average effect. This may be due to the dependence on primary and agricultural sectors in Africa. Chang et al. (2009) use a similar to the one employed in this paper to instrument for openness, however, their methods relies on gravity- model type variables.

$$TO\_CH_{i,t} = \gamma_0 + \gamma_1 initGDP_i + \gamma_2 Growth_{i,t} + \gamma_3 TO\_EU_{i,t} + \gamma_4 TO\_US_{i,t} \qquad (2)$$
$$+\gamma_5' CV_{i,t} + \omega_{i,t}$$

$$TO\_US_{i,t} = \theta_0 + \theta_1 initGDP_i + \theta_2 Growth_{i,t} + \theta_3 TO\_EU_{i,t} + \theta_4 TO\_CH_{i,t} \qquad (3)$$

$$+\theta_5' CV_{i,t} + \epsilon_{i,t}$$

$$TO\_EU_{i,t} = \alpha_0 + \alpha_1 initGDP_i + \alpha_2 Growth_{i,t} + \alpha_3 TO\_CH_{i,t} + \alpha_4 TO\_US_{i,t} \qquad (4)$$
$$+\alpha_5' CV_{i,t} + \varphi_{i,t}$$

In the second stage regression, the predicted residuals from these equations $\hat{\omega}_{it}, \hat{\epsilon}_{i,t}$, and $\hat{\varphi}_{i,t}$ are then used as instruments for trade openness to China *(TO_CH)*, US *(TO_US)* and EU *(TO_EU)* respectively. These residuals can be viewed as bilateral trade openness measures to each of the major trading partners, after partialling out the effects of growth, trade openness to other major partners and the remaining control variables. In these first stage regressions, therefore, we are retrieving the variation in trade-openness which is not due to the explicitly modelled variables, one of which is economic growth. *Rainfall* is used to instrument for growth in *equations (2)*, *(3)*, and *(4)* consistent with Barrios et al's (2010) result that significant effects of rainfall on GDP are limited to the Sub-Saharan African region; which is not surprising given the significant role played by agricultural sector in these economies. The exclusion restriction used in the two stage least squares estimation of *equations (2) to (4)* is that, conditional on GDP per capita growth, year to year variations in rainfall only affect trade openness through real GDP per capita growth effects. The individual estimates of the error term from *equation (4)*, namely trade openness to US, EU and China are then each used as instruments in the estimation of *equation (1)*.

Yet another method employed within this paper to deal with the endogeniety within a static, panel data framework is the Hausman-Taylor estimator (1981). This estimator assumes the availability of instrumental variables from within the model. One distinct advantage of applying this estimator is that it also allows for some regressors to be correlated with the fixed effects while simultaneously controlling fixed effects estimation. When estimating the model using the HT estimator, we treat the three variables measuring bilateral trade openness, *TO_CH*, *TO_EU* and *TO_US,* as endogenous regressors and thus correlated with the error term. Various other combinations of endogenous variables are employed, though not necessarily presented in this paper. The results are both qualitatively and quantitatively similar across *all* these models and hence our findings are very robust. Employing the HT estimator also provides the opportunity for comparison of this modelling approach with the two-stage least squares approach outlined above thus providing an additional robustness check.

3. Data, measurement and Sources

Real GDP per capita data for the dependent variable and initial income variable is obtained from Penn World Tables version 8 (with 2005 used as the base year). The bilateral trade and GDP data used to construct the trade openness variable between each African country and the major trading

partners EU, China and the US are obtained from the International Monetary Fund's Direction of Trade Statistics (DOTS) and World Development Indicators (WDI) Database respectively. Private sector investment is from Penn World Table 8 while FDI and AID data are both from WDI. Data used to construct the conflict indicator was obtained from version 4-2009 of the Peace Research Institute Oslo (PRIO) dataset. The polity2 measure provided by the Polity IV project of the Integrated Network for Social Conflict Research (INSCR) was also used in our study. Our regressions also control from inflation by including the absolute deviation of inflation from 3 in logs (see Chang et al. 2009). To implement the proposed two stage least squares strategy we use historical precipitation data obtained from the World Bank Climate Research Unit based on 2 degree latitude by 2 degree longitude native resolution ,measured in millimetres, covering the sample period 1990-2009. Variable definitions, data sources descriptive statistics and the country list used within this study are detailed in *Table 1* below.

Regional and year dummy variables are included to our regression specification in order to control for both regional and temporal effects within the sample. Before carrying out our computations we compute non-overlapping 2-year averages spanning 1990-2009. The reason for this transformation is that averaging the dataset helps to capture steady state relationships between the variables on the one hand while simultaneously removing, to a certain degree, measurement error and business cycle effects[7].

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[7] It is standard practice in the literature to use 5- or 10-year averages. Chang et al. (2009) exemplify this approach. The idea is that this will alleviate business-cycle effects and measurement error. Attanasio et al. (2000), for example, argue that using 5- or 10- year averages is such studies is undesirable since it "throws away" too much information. However such studies tend to utilize annual data since 1960, while in this sample we use only 1990-2009 data.

Table 1: Variable Descriptions, Summary Statistics and List of Countries.

Variable	Source	Unit of Measurement	Mean	Overall standard deviation	Between standard deviation	Within Standard Deviation	Minimum	Maximum
Real GDP per Capita	Penn World Tables 8	GDP PPP US$(Yr. 2005)	2334.85	2611.96	2445.93	992.85	227.83	12503..96
Initial GDP(1990)	Penn World Tables 8	GDP PPP US$(Yr. 2005	7.23134	0.1570	0.0795	0.13597	5.782	9.011
Log of Trade openness to China	DOT/WDI	Log of GDP share	-4.501	1.713	1.28	1.16	-9.989	0
Log of Trade openness to USA	DOT/WDI	Log of GDP share	-3.69	1.573	1.464	0.619	-9.699	0
Log of Trade Openness to EU	DOT/WDI	Log of GDP share	-1.652	0.6252	0.559	0.2932	-3.3765	-0.1791
Private Sector Investment	Penn World Tables 8.	Share of GDP	0.1348	0.1868	0.1368	0.1289	-1.1898	0.9101
FDI to GDP ratio	WDI	Share of GDP	0.0371	0.0931	0.0541	0.07617	-0.07217	1
AID to GDP ratio	WDI	Share of GDP	0.1152	0.112	0.0773	0.0815	00012	1
oilprod	African Petroleum Producers Organisation	Indicator Variable	0.3784	0.486	0.4917	0	0	1
Conflict	UCDP/PRIO Armed Conflict Dataset Codebook	Indicator Variable	0.2892	0.454	0.3733	0.2649	0	1
Polity2	PolityIV-	Integer Variable	-0.1622	5.1997	4.273	3.037	-9	10
inflation	WDI	Log of absolute deviation from 3	1.533	1.3917	1.006	0.9742	-5.046	7.603
lrainfall	World Bank Climatology Unit	Log of rainfall in mm	4.116	0.8969	0.0936	0.08889	1.1559	5.362

Countries:
East Africa: Kenya (KEN), Mauritius (MUS) ,Malawi (MWI), Rwanda (RWA), Tanzania (TZA) ,Zambia (ZMB), Zimbabwe (ZWE), Burundi (BDI), Comoros (COM), Ethiopia (ETH), Uganda (UGA)
North Africa: Djibouti (DJI), Egypt (EGY), Morocco (MAR), Tunisia (TUN),
Middle Africa: Angola (AGO), Cameroon (CMR), Central African Republic (CAF), Chad (TCD), Congo Rep (COG)., Equatorial Guinea(GNQ), Gabon (GAB)
South Africa: Botswana (BWA), Mozambique(MOZ), South Africa (ZAF)
West Africa: Benin (BEN), Burkina Faso (BFA), Cote d' Ivoire (CIV), Ghana (GHA), Guinea(GIN), Mali (MLI), Mauritania (MRT), Niger (NER), Nigeria (NGA), Senegal (SEN), Sierra Leone (SLE), Togo (TGO)
EU Countries:
 Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the UK.
Oil Exporters:
Angola, Benin, Cameroon, Chad, Congo, Rep. Cote d'Ivoire , Egypt, Equatorial Guinea, Gabon, Mauritania, Niger, Nigeria, South Africa.

Table 2a: Bivariate correlation between growth and determinants

	Growth	Initial GDP(1990)	Log rainfall	Trade openness to China	Trade openness to USA	Trade Openness to EU	Private sector Inv. Share	FDI to GDP ratio	AID to GDP ratio
Growth	1								
Initial GDP(1990)	-0.1691	1							
Log rainfall	0.0015	-0.1448	1						
Trade openness to China	0.2488	0.0112	0.1382	1					
Trade openness to USA	0.1940	-0.1064	0.1316	0.5552	1				
Trade Openness to EU	-0.0048	0.2931	0.0292	0.2377	0.3005	1			
Private Investment Share	0.3602	0.2754	0.0747	0.3522	0.3253	0.2557	1		
FDI to GDP ratio	0.4349	-0.2130	0.0877	0.2730	0.3058	0.2365	0.2816	1	
AID to GDP ratio	-0.1765	-0.4718	0.0868	-0.0651	0.0171	-0.2270	-0.5126	-0.0538	1

Table 2b: Bivariate correlation between growth and determinants

	Oilprod	Conflict	Polity2	Inflation	E_A	W_A	M_A	N_A
Growth	0.1853	-0.0660	-0.0170	0.0680	-0.0939	-0.0829	0.1490	0.0135
Initial GDP(1990)	0.0333	-0.2519	0.0631	-0.1216	-0.0846	-0.2258	0.0175	0.2975
Log rainfall	-0.1234	0.0775	0.1186	0.2471	0.2386	-0.0023	0.2789	-0.6084
Trade openness to China	0.2297	-0.1636	0.0116	0.0852	-0.2859	0.1160	0.1490	-0.0007
Trade openness to USA	0.4563	0.0298	-0.0494	0.3164	-0.4556	0.1519	0.2740	-0.0258
Trade Openness to EU	0.2505	-0.2270	-0.1598	-0.0379	-0.4199	0.1883	0.1471	0.2694
Private Sector Investment Share	0.3701	-0.1123	-0.1015	0.1888	-0.2542	-0.2059	0.4412	0.0461
FDI to GDP ratio	0.2316	0.0228	-0.1289	0.1783	-0.1419	-0.1035	0.3256	-0.0225
AID to GDP ratio	-0.2775	01963	0.0278	0.1817	0.2324	0.0251	-0.1942	-0.1946
Oilprod	1	0.0007	-0.1363	0.1239	-0.5075	0.1737	0.4769	-0.0922
Conflict		1	-0.1524	0.1433	0.0983	-0.0826	0.2042	-0.1343
Polity2			1	-0.0556	0.0950	0.1040	-0.2606	-0.3006
Inflation				1	0.1195	-0.1466	0.2066	-0.2527
East Africa					1	-0.4506	-0.3142	-0.2265
West Africa						1	-0.3347	-0.2412
Middle Africa							1	-0.1682
North Africa								1

Summary measures from the compiled dataset are presented in *Table 1* and *Table 2*. *Table 1* contains variable definitions in addition to the sources of all key variables, their units of measurement, means, standard deviations (overall, between and within countries), and minimum and maximum values. It can be seen from *Table 1* that all variables excluding "*oilprod*" the binary indicator capturing whether the country is an oil producer or not, have some within variation. *Tables 2a and 2b* provide the correlation coefficients between for all variable pairs within the dataset. A preliminary analysis of the pairwise correlations suggests that they are, in general, acceptable. These results, though preliminary, do not highlight any difficulties with our method of estimation.

4. Results

Table 3 below contains pooled ordinary least squares (OLS) estimates of the model, presented under various specifications. The regression results show an unambiguous negative effect of initial GDP on the real per capita growth rate across all specifications, implying that countries with lower real GDP per capita in 1990 grew relatively faster between 1990 and 2009. Trade openness with China and EU are the only two statistically significant coefficients across all specifications of the model. Trade-openness with China, in this basic specification, appears to have a positive effect on GDP growth; the opposite effect of trade openness with the EU. The magnitude of the coefficient implies that if openness to China increases by 1%, then growth per capita will increase by between 0.01-0.04 percent if the pooled OLS estimates are to be believed. On the other hand, an increase in openness to the EU by 1% leads to decrease in growth of between 0.03-0.057 percent. Africa-US trade appears, from these results, to have no statistically significant effect on real output growth.

Across all other coefficients, the largest marginal contributor to real economic growth in Africa, over the period was foreign direct investment. According to *Table 3,* an increase in FDI to GDP ratio of 1% leads to an increase in growth of real GDP per capita of 0.62% to 0.68%. This result suggests that, ceteris paribus, the effect of an increase in FDI on economic growth is more than 10-fold the effect of an equi-proportionate increase in Africa's bilateral openness with China. The pooled OLS estimates reveal that the next important factor, in terms of magnitude, influencing real growth in Africa is the private sector investment to GDP ratio. According to the preliminary results presented in *Table 3*, a 1% increase in private investment share increases real per capita GDP growth by between 0.25 and 0.28 percent depending on the specification one prefers.

On the other hand, increases in AID to GDP ratio in African countries appear to have a statistically significant negative effect on economic growth. Holding all other factors equal, were aid to GDP ratio in Africa to increase, on average by 1% the regression results imply that economic growth would decrease by 0.21% to 0.3%. The results also reveal statistically significant, negative effects of some regional indicator variables. In particular, the findings are consistent with the statistically significant and relatively slower growth in Central and Western Africa when compared to Southern Africa over the sample period. In one specification, where year dummies are not included, the coefficient on "*oilprod*" is positive and significant, implying that

Table 3: Pooled Ordinary Least Squares Estimates: Static Model

Dependent Variable: Logged Difference of Real GDP per Capita				
Estimation Method	OLS(robust) (i)	OLS(robust) with year dummies only (ii)	OLS (robust) with both year and country dummies (iii)	OLS(robust with country dummies only) (iv)
Control Variables				
Initial GDP(1990)	-0.051*** (0.0116)	-0.052*** (0.01)	-0.043 (0.0310)	-0.099*** (0.029)
Trade openness to China	0.009* (0.005)	0.0113* (0.0062)	0.0375*** (0.0128)	0.0136* (0.008)
Trade openness to USA	-0.0026 (0.006)	-0.0042 (0.006)	-0.0149 (0.0154)	-0.0088 (0.0156)
Trade Openness to EU	-0.0336*** (0.0111)	-0.0361*** (0.0122)	-0.05691** (0.02913)	-0.0563** (0.0262)
Private Sector Investment	0.2468*** (0.0569)	0.234*** (0.0508)	0.254** (0.1192)	0.2777** (0.1083)
FDI to GDP ratio	0.666** (0.272)	0.6753*** (0.2493)	0.6229** (0.2677)	0.6185 (0.3502)
AID to GDP ratio	-0.217* (0.1122)	-0.2495*** (0.1278)	-0.3087 (0.2308)	-0.21* (0.2124)
Oilprod	0.0248 (0.0177)	0.0250 (0.0185)	-0.0363 (0.0243)	0.1262*** (0.0372)
Conflict	-0.01888 (0.0138)	-0.0183 (0.0143)	-0.0088 (0.03332)	-0.0089 (0.0306)
Polity2	0.0011 (0.0022)	0.0013 (0.0023)	0.0033 (0.0059)	0.0015 (0.0055)
Inflation	-0.0031 (0.006)	-0.002 (0.0059)	-0.00337 (0.0072)	-0.0027 (0.0075)
East Africa	-0.026 (0.0216)	-0.0273 (0.0228)	-0.0568 (0.117)	0.0667 (0.0876)
West Africa	-0.0475** (0.0232)	-0.0479* (0.0243)	0.1138* (0.0655)	-0.039 (0.0758)
Middle Africa	-0.0678*** (0.0241)	-0.0672** (0.0252)	-0.0742 (0.0701)	-0.1465** (0.0538)
North Africa	-0.0103 (0.0321)	-0.0123 (0.0345)	0.0718 (0.093)	-0.0268 (0.0661)
Constant	0.3706*** (0.094)	0.394*** (0.0919)	0.4027*** (0.2557)	0.629*** (0.2067)
R^2	0.3420	0.3781	0.4409	0.3931
Observations	333	333	333	333

Notes: *** means significant at the 1% level
** means significant at the 5% level
* means significant at the 10% level

oil-producing countries tend to grow faster on average than countries which are not oil-producing.

One important disadvantage of employing the pooled OLS regression as an adequate estimation strategy for this model is that it ignores heterogeneity within the sample. For this reason, methods that explicitly take heterogeneity are more desirable. This econometric problem is appropriately addressed by exploiting standard panel data methods below.

Before undertaking panel data analysis however, statistical tests are undertaken in order to assess whether random effects panel data methods or fixed effects methods should be more appropriately applied to model the cross-country heterogeneity within the data. The Hausman specification test performed on the data yields a test statistic of 20.28 and an exact level of significance of 0.016[8]. This result implies that at the 5% level of significance we cannot accept the null hypothesis that cross-country random effects are uncorrelated with the regressors, casting doubt on the appropriateness and relevance of the random effects model to the sample data.

Consistent with the Hausman specification test results, fixed effect estimates of the coefficients of the model are provided in column *(i)* of *Table 4.* The estimate of the coefficient on Africa's bilateral trade openness to China is positive and statistically significant, albeit at the 10% level. The coefficient on the variable bilateral trade openness with the EU is negative and statistically significant at the 1% level. This indicates that, ceteris paribus, a 1% increase in EU-African trade reduces growth in Africa by 0.06%.

These findings corroborate the earlier pooled OLS results (*Table 3*) that FDI to GDP ratio and private sector investment are major positive contributors to economic growth in Africa. Moreover, the orders of magnitude of each of these coefficients are similar to the values obtained in the pooled OLS case. For example, a 1% increase in FDI to GDP ratio leads to a 0.62% increase in GDP growth, which is precisely the range predicted by the pooled OLS model. By constrast, however, AID to GDP ratio does not have a statistically significant impact on economic growth. As expected, all time invariant, country-specific regressors are excluded from the fixed effect model.

Column (*ii*) of *Table 4* provides fixed effects estimates using the two-stage estimation strategy described earlier. Recall that the idea behind this technique is to control for endogeneity between trade and bilateral openness variables. Using this approach, the elasticity of economic growth with respect to bilateral trade openness with China is 4%, implying that a 1% increase in trade-openness to China will lead to an increase in real GDP per capita growth of 0.04%. This coefficient is statistically significant at the 1% level. The two-stage procedure also reveals that increasing bilateral trade openness with the EU by 1%, ceteris paribus, also has a statistically significant but opposite effect on economic growth. It appears to reduce economic growth in Africa by 0.08%. The results further confirm that FDI has had the largest positive impact on economic growth in Africa between 1990-2009 and that an increase in domestic private

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[8] Another version of the Hausman specification test usually attributed to Yair Mundlak and outlined in Woolridge (2010) involves augmenting the model using time averages of the time-varying explanatory variables. The basic idea of this test is that if there is a systematic relationship between the individual country specific effects and the time-varying regressors it may show up as a relationship between the individual effects and the country averages. The statistical decision of the standard Hausman test is also robust for Mundlak's specification test.

Table 4: Fixed Effects and Instrumental Variable Estimates
Dependent Variable: Logged Difference of Real GDP per Capita

Estimation Method	Fixed Effects Estimation	Instrumental Variable Approach (Brückner and Lederman Approach) Fixed Effects	Hausman Taylor Estimator Year dummies Included	Hausman Taylor Estimator Amimiya-Mcurdy Estimation Year dummies Included
	(i)	(ii)	(iii)	(iv)
Initial GDP(1990)	-	_	-0.0534*** (0.0146)	-0.0525*** (0.0136)
Log of Trade openness to China	0.0136* (0.0073)	0.0412*** (0.0137)	0.0381*** (0.0115)	0.0148** (0.008)
Log of Trade openness to USA	-0.0088 (0.0147)	-0.0064 (0.0154)	-0.0110 (0.0117)	-0.006 (0.008)
Log of Trade Openness to EU	-0.0564*** (0.0247)	-0.085*** (0.0297)	-0.0581** (0.0237)	-0.0415** (0.0172)
Private Sector Investment	0.2777** (0.1021)	0.3328*** (0.0902)	0.1979*** (0.0695)	0.2401*** (0.063)
FDI to GDP ratio	0.6185* (0.3301)	0.7316** (0.2879)	0.6397*** (0.1229)	0.6641*** (0.1138)
AID to GDP ratio	-0.21001 (0.2002)	-0.2083 (0.2172)	-03495*** (0.1241)	-0.265** (0.1133)
oilprod	-	-	0.0252 (0.0249)	0.0254 (0.0236)
Conflict	-0.0089 (0.0288)	-0.0054 (0.031)	-0.0079 (0.0203)	-0.0161 (0.0194)
Polity2	0.0015 (0.0052)	0.0035 (0.0056)	0.0024 (0.002)	0.0016 (0.0019)
inflation	-0.0027 (0.0071)	-0.0057 (0.0071)	-0.003 (0.0071)	-0.0021 (0.0066)
East Africa	-	_	-0.0141 (0.0411)	-0.0256 (0.0384)
West Africa	-	-	-0.0142 (0.0420)	-0.0447 (0.0393)
Middle Africa	-	-	-0.0548 (0.0453)	-0.0641 (0.0434)
North Africa	-	_	0.0351 (0.0506)	0.0189 (0.0480)
Constant	-0.0692 (0.0701)	-0.0222 (0.044)	0.5018*** (0.1704)	0.404*** (0.139)
R^2	0.1906	0.2610	-	-
Chi-squared	-	-	163.90***	161.40***
Observations	333	333	333	333

Notes: *** means significant at the 1% level
** means significant at the 5% level
* means significant at the 10% level

investment also played an important role in this regard. The orders of magnitude are also more or less similar to those implied by the pooled OLS *(Table 3)* and fixed effects model in column *(i)*. Neither AID to GDP ratio nor the remaining variables appear to matter as factors driving real GDP per capita growth, however, under this specification of the model.

Hausman-Taylor estimates of the model's parameters can be found in columns *(iii)* and *(iv)* of *Table 4*. As mentioned above, the Hausman and Taylor estimator allows for the inclusion of time

invariant regressors and also controls for endogeneity through the use of internal instruments. The estimates in columns *(iii)* and *(iv)* were derived using bilateral trade openness variables as the endogenous parameters[9]. Column *(iii)* displays the results of the Hausman-Taylor estimation and column *(iv)* displays the variant of the Hausman Taylor estimator due to Amemiya-MaCurdy (1986).

Interestingly, the results across both estimators are similar. Initial GDP, trade openness to China, FDI to GDP ratio and private sector share of the economy are again found to be the key determinants of economic growth per capita in Africa, while bilateral trade openness to the EU and AID to GDP ratio show a negative and statistically significant effect. Again the results show unequivocally that FDI to GDP ratio is the key driver of growth on the continent.

Importantly, the sign and significance of the coefficients are generally similar across both models. The main difference across the HT estimates, is in the magnitudes of the coefficients. In particular the Amemiya-MaCurdy variant of the HT estimator provides estimates of a lower order of magnitude for the coefficients on bilateral trade openness and AID-to-GDP ratio. The magnitude of the coefficients is, in general, consistent with prior findings that Sino-African trade increase of 1% increases GDP growth of between 0.01% to 0.03%. A similar increase in bilateral trade to the EU leads however to a reduction in GDP growth of between 0.04% and 0.05% according to the HT estimates.

Evidence across various specifications in our analysis suggests that over the 1990-2009 sample period examined, the turnaround observed in the growth fortunes of African economies can be traced to a combination of factors namely: an increase in FDI, private investment and openness to trade. Interestingly the results clearly reveal, however, that there is a noticeable distinction between the effects of trade openness conditional on the particular trading partner. More trade with the United States does not contribute to African growth; increased trade with China had positive real growth effects, while trade with EU reduced growth despite the existence of special trade relations between the two. This result is consistent with prior research which have indeed questioned the effectiveness of the Lomé conventions and EBA initiatives. One-way preferences, they argue, have perpetuated dependency on a single market and production of over-priced primary products that have no comparative advantage and stand little chance to compete in a more open trade environment (Arts and Byron, 1997; Bhantia, 2007). The EBA initiative is also thought to have flaws in its conception, notably in relation to its complicated and restrictive rules of origin, to deliver a tangible impact on growth (Kohnert, 2008).

5. Discussion

It is useful to compare our findings with existing studies from the literature examining the impact of trade on growth in Africa. As can be expected, a certain degree of caution should be exercised in establishing direct comparisons between earlier research papers and the results we present here. In particular, differences in i) the sample period analysed, ii) the actual countries included within the estimation sample, iii) the variables included within the empirical model and the measurement

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[9] Alternative assumptions regarding the set of endogenous variables produce qualitatively identical and quantitatively similar findings.

of such variables, iv) the frequency of the variables employed to carry out the analysis and v) the estimation methods and model specification are only a few reasons why direct comparison between empirical results cannot be made.

Of recent research papers on trade and growth in Africa, arguably the one that bears the closest methodological similarity to our paper is the IMF study by Brückner and Lederman (2012) which makes use of an unbalanced panel of annual data for a similar sample of 40 Sub-Saharan African countries over the period 1980-2009. Brückner and Lederman (2012) test the hypothesis that trade causes economic growth in Africa, employing a two-stage least squares approach and using an identical definition of the dependent variable and trade-openness employed in our paper. The authors conclude that "a one percentage point increase in openness in Sub-Saharan Africa is associated with a short run increase in growth of 0.5% per year". They infer further that the long run effect of a one percentage point increase in trade openness on growth reaches to approximately 0.8% percent after 10 years. The results of the regression results presented earlier in our paper reveal the *regional* effects of increases in bilateral trade openness over the period 1990-2009 (20 years) of an order which is less than one tenth of Brückner and Lederman's (2012) estimates. Our results therefore do not contradict their findings and are, in fact, arguably consistent. By way of comparison, the two stage least squares estimates of the positive effects of an equi-proportionate increase (a 1% increase) in Africa's bilateral openness to China was 0.04% per year, roughly one tenth of Brückner and Lederman's (2012) estimates. Given Brückner et al's (2012) findings, our results suggest that trade between Africa and China and also Europe are key determinants of trade related real economic growth in Africa. The growth effects of Africa's trade will therefore depend, to a large degree, on the structure, composition, terms and nature of trade between its major trading partners.

Chang and Mendy (2012) also investigate the effect of trade openness on economic growth in Africa using a sample of 36 countries over the period 1980-2009. Included among the regressors in their empirical model along with trade-openness, measured in a similar fashion as the one we use, are measures of investment and aid. Firstly, Cheng and Mendy (2012) find that openness and FDI positively and significantly influence economic growth in Africa. This result concurs with our findings. Finding mixed results on signs of aid and investment, however, the authors conclude that these variables positively affect growth conditional on whether there are complementary growth-inducing policies in place within the specific countries or region of Africa being examined. Our study represents an improvement on the results of these authors since we explicitly account for the endogeneity which can reasonably be expected in the data. Our findings may also be of greater practical importance to policymakers hoping to make decisions regarding trade diversification and the nature and impact of the economic relationships between the major economies of the world and Africa's economic growth. The preferred specification of the model presented in this paper also differs from that employed in the Cheng and Mendy (2012) paper in the sense that the authors limit themselves to the popular fixed effects panel data methods which does not allow them to make use of potentially useful information which results from the correlation between independent variables and the country-specific fixed effects.

Baliamoune-Lutz (2011) employs a range of panel data techniques including the dynamic GMM approach to investigate the hypothesis that "where you export matters" using 1995-2008 data. The

paper concludes that imports from China has a robust positive effect on growth in Africa and that there is an inverted U-shape function relating exports to developed countries and economic growth in Africa. However the actual regression results show very little evidence of exports to China influencing growth outcomes in Africa. Moreover, several signs on the coefficients are counterintuitive or insignificant suggesting that the model chosen might not have been the most appropriate for the data. Despite these concerns, the overall conclusion from Baliamoune-Lutz's (2011) empirical model is that the trade partner mix is an important determinant of growth in general. Our empirical results support this view by confirming that bilateral trade with China is an important determinant of African growth.

6. Conclusion

This paper investigates the main factors driving the reversal of the economic growth fortunes of African economies over the period 1990-2009. This study extends the literature in two main ways. Firstly, it disentangles the effect of trade by disaggregating the trade openness variable to account separately for Africa's openness with its three main trading partners: China, USA and the EU, three major economic players in the world economy. Consequently, we find that among these three major trading partners, Africa's trade with China has been more conducive to economic growth compared to its trade with America and Europe. In fact, of all these trading partners explicitly modelled, China is the only partner which robustly and significantly positively causes growth in Africa. When one views our results in the context of the broader literature, our findings suggest that over the period 1990 – 2009, up to one-tenth of the economic growth in Africa directly attributable to foreign trade is due to Africa's trade with China. On the other hand, our results suggest that Africa's bilateral trade with Europe has the opposite effect. We interpret this loosely that the European bilateral trade with the continent is of an extractive nature. By this we mean that we cannot find evidence that Euro-African trade significantly contributes to real economic growth per capita in Africa. One limitation of our modelling approach is that we are unable to explicitly identify the specific factors that lead to the negative effect of European trade on economic growth in Africa or that drive China's positive influence. It has been suggested in the literature that special trade arrangements between Africa and EU have not yielded expected results due to some inherent flaws. However, we do not explore these issues directly here.

Nevertheless, our conclusions suggest that shifting trade alliances (trade diversification over the partner space) can significantly affect growth outcomes and that diversifying trade away from Europe and towards China has, in fact, been playing a key role in reversing poor real growth outcomes in Africa over the period 1990-2009.

Secondly, our results imply that, *ceteris paribus*, Africa has been gaining more through growth by focussing on foreign direct investment and savings than through its trade policy. This implies that implementing further policies which encourage increased FDI and domestic savings and strengthening institutions which facilitate the efficient allocation of these resources to productive enterprises throughout the economy should be growth inducing. Furthermore, the study confirms earlier findings that aid dependence is not a viable medium- or long-term growth-inducing strategy for Africa. We also find very little evidence of systematic intra-regional geographic growth spillovers once heterogeneity is explicitly modelled. The latter finding suggests that there

may be further scope for improving intra-regional economic relationships within the continent. Remarkable heterogeneity between African economies, as evidenced within the data, suggests however that there is no "one size fits all" policy for economic development in Africa and the specific circumstances of the country for which policy is being formulated must be judiciously taken into account.

Finally, while recent growth outcomes have been positive and encouraging for the continent it must be borne in mind that African economies are highly susceptible to any reversal in recent trends in their bilateral trade with China. In particular, on the basis of our results, a potential slowdown in the Chinese economy which affects the external sector would potentially be more harmful to African economies than an equivalent downturn in Europe. Policy-makers, therefore, need to ensure that foreign direct investment and domestic saving are directed to sectors within African economies that can help to insulate the African economies against such potential shocks. If not, there are serious risks of a return to the poor growth trends of prior decades.

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