

**Growth by destination (where you export matters):
Trade with China and growth in African countries***

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Abstract

I perform Arellano-Bond GMM estimations using panel data over the period 1995-2008 and explore the growth effects of Africa's trade with China, distinguishing between the effect of imports and the effect of exports, and controlling for the role of export concentration. Four important results are obtained from the empirical analysis. First, there is no empirical evidence that exports to China enhance growth unconditionally. Second, the results suggest that export concentration enhances the growth effects of exporting to China, implying that countries which export one major commodity to China benefit more (in terms of growth) than do countries that have more diversified exports. Third, contrary to the widely held view that increasing imports from China would have a negative effect, the empirical results show that the share of China in a country's total imports has a robust positive effect on growth. Finally, the evidence suggests that there is an inverted-U relationship between exports to developed countries and growth in Africa. Overall, the results seem to provide support for the hypothesis of *growth by destination* (i.e., that where a country exports matters for the exporting country's growth and development). I draw on these findings to outline some policy implications.

JEL classification: F1, F41, O2, O4

* This paper is a part of an ongoing research on the contribution of trade to long-term growth and development. A more extensive study titled "development by destination versus development by origin: theory and evidence on how trade may determine development patterns" is in Baliamoune-Lutz (*forthcoming*). I am grateful to the *International Center for Economic Research (ICER)*, Turin, Italy, for a fellowship that supported my research in this area.

By offering aid without preconditions, China has presented an attractive alternative to conditional Western aid, and gained valuable diplomatic support to defend its international interests. However, a generally asymmetrical relationship differing little from previous African–Western patterns, alongside support of authoritarian governments at the expense of human rights, make the economic consequences of increased Chinese involvement in Africa mixed at best, while the political consequences are bound to prove deleterious
Tull (2006, p. 459)

1. Introduction

David Ricardo's comparative-advantage theory implies that countries do better by specializing as opposed to diversifying exports. With the publication of some seminal work on specialization in primary products in the 1950s (Prebisch, 1950 and 1959; and Singer, 1950), development economists have been stressing the link between concentration, especially in primary products, and the terms-of-trade deterioration (Sachs and Warner, 1999, 2000 and 2001; Sachs and Rodriguez, 1999). In the case of Africa (and Latin America), the bulk of the empirical evidence (Sachs and Warner 2001; Balamoune-Lutz and Ndikumana 2007; Balamoune-Lutz 2009a; Collier and Goderis, 2009), at least until recently, has been, more in favor of the Prebisch-Singer proposition. Given the recent developments in the markets for primary commodities (higher global demand for many) it would be interesting to explore whether recent African trade data, particularly data on trade with China, still validate the Prebisch-Singer proposition

The composition of trade can be determined by many factors including ties to former colonial powers and the needs of major trading partners (which often are also former colonizers) and proximity to large markets (for example, Africa's exports to Europe). It is quite plausible that the *destination* of exports could play an important role in determining a country's trade patterns and, hence, its development trajectory. In theory, there are various channels through which the destination of a country's export could influence long-term growth and the patterns of development (Balamoune-Lutz, *forthcoming*). One channel may stem from export-related inward foreign direct investment (FDI targeting specific export sectors) in mineral and mining sectors, for example. When countries invest in these sectors in a developing country and use their own firms (or MNCs) in the host country, it is likely that such firms would have an influence on labor markets. For example, they may have an effect on labor standards, labor union bargaining power, or the extent of social protection, with implications for asset ownership, education and health, and thus may have—at least for the region where the investment is taking place—an important impact on long-term growth and development. Certain types of FDI may also have a negative effect on the quality of institutions and governance. Finally, export-related FDI in mineral rich countries may crowd out other sectors (in particular manufacturing) that may be vital to long-term growth. The level of development in the importing country also may matter (Arora and Vamvakidis, 2005). An economy (especially one as large as the Chinese economy) that is in its medium stages of development would in general have a growing manufacturing sector and plausibly increasing wages for the labor employed in the expanding sectors. Hence, demand for consumption goods and natural resources (especially fuel) would be growing. On the other hand, import of manufactures (and, later on, industrial goods) would be restricted. Yet when its trade partners are also developing countries, they may want to expand the manufacturing sector but would not be able to do so if export markets are limited. This, indeed, seems to be the current situation of the trade relationship between most African countries and China.

There is currently a significant debate about China's increased engagement in Africa. While many stress that China's interest in Africa is new and focuses primarily on the continent's wealth of natural resources (including land), historical facts indicate that Sino-African relations go back to ancient times and China has played an active diplomatic and political role in Africa for over 50 years now,¹ and its current engagement in Africa involves more than just trade in natural resources. As argued by Gill and Reilly (2007), "China's current engagement in Africa is rooted in more than 50 years of friendly, respectful, and supportive relations between China and African countries. Beijing was quick to assist the emergent nations of postcolonial Africa even at a time when China was itself isolated, poor, and beset with internal upheavals." Moreover, China's policy of noninterference which has served to safeguard China's own sovereign rights (Anshan, 2007) is appealing to many (perhaps most) African leaders and Africa's citizens who maintain that China treats them as equal and, something they feel, the West has generally failed to show in its dealings with Africa.

Yet, there is a large pool of skeptics mainly in the West (and among some Africans) that China's hunger for natural resources implies that it would do anything to get them including helping maintain tyrannical regimes that benefit from natural resource revenues, and thus would retard or prevent political and economic reforms in those countries. In addition, there are some who fear that China's growing economic engagement in Africa may have a severe negative impact on the environment. However, without any empirical testing, these hypotheses may remain mere speculations.

For economists undertaking research on Africa in particular a major question that is frequently being raised nowadays is the impact of the Sino-African trade on development and growth in Africa.² Since labor costs in China are generally lower than wages in most of the rest of the world, and given the way GDP is computed and the large body of literature on exports and growth, it is often tempting to focus the debate on the impact of imports (from China) and take as given that the impact of export to China is positive. Recent studies have focused on the effects of increased imports on African firms and workers, and growth (see, for example, Gebre-Egziabher, 2007). Interestingly, Maswana (2009) uses Toda-Yamamoto's version of Granger causality and tests whether trade with China could trigger economic growth in Africa, focusing on South Africa and Kenya as a proxy for African economies. The author obtains evidence suggesting that it is imports from —not exports to— China that seem to have positive effect on growth in two countries. Indeed, in the case of Africa increasing exports to China may raise at least two particularly pertinent questions. First, given the evidence reported in the literature on the impact of export diversification on development and growth, Africa's high concentration in primary commodities implies that the continent may or may not benefit from increasing exports to China. Export concentration in primary commodities has been linked to conflict, inefficiency of institutional and policy reforms (Baliamoune-Lutz and Ndikumana, 2007), macroeconomic instability, and ineffectiveness of aid (Fosu, 1990 and 1996; Baliamoune-Lutz, 2009a). Second, in the past, exports of large amounts of natural resources went to highly developed countries. Certainly, China has recently been growing at a fast rate but it is still far from being a developed country, at the level of Africa's rich trade partners (EU and U.S., for example). This highlights two important points: (1) China's demand for natural resources will not fall or even stop increasing any time soon, and (2) because it is still a developing country (based on per-capita income) and one

¹ In the early 1990s, there was still debate whether Africa matters to China (see Segal 1992).

² There is an emerging body of research on this topic. See for example, Goldstein et al., (2006), Broadman, (2007), Zafar (2007), and Maswana (2009).

with a vast pool of unskilled labor, China will still (for many years to come) compete and mostly win against other developing countries on the basis of labor costs, especially unskilled labor wages. Thus, we should expect its exports to the world, including Africa, to keep on growing which may contribute to preventing or at least delaying production (and export) diversification in Africa. Therefore, given these issues and the fact that a substantial portion of Africa's exports to China consists of primary commodities, it would be more interesting to study the impact of exports to China on growth (and development) in Africa.

In this paper I primarily try to explore this point by using annual data over the period 1995-2008 and examining the effects of exports to China (measured as the share of exports to China in the exporting country's GDP) on growth. More specifically, I try to address the following two questions. First, do exports to China promote growth in Africa? Second, does export concentration matter to the relationship between exports and growth? To do so, I use the Arellano-Bond GMM estimator to take into account the issue of endogeneity. I control for other major factors that could influence growth, particularly export diversification and the share of exports to the rest of the world (developed countries). Four important results are obtained from the empirical analysis. First, there is no empirical evidence that exports to China enhance growth unconditionally, while there is strong evidence that exporting to the rest of the world has a positive impact on growth in Africa. Second, the results suggest that export concentration (using two different measures) enhances the growth effects of exporting to China, this implies that countries which export one major commodity to China (such as Angola or Sudan) benefit more (in terms of growth) than countries that have more diversified exports (for example South Africa). Third, contrary to the widely held view that increased imports from China would have a negative effect, the empirical results indicate that the share of China in a country's total imports has a robust positive effect on growth. Finally, the evidence suggests that there is an inverted-U relationship between exports to the rest of the world (excluding China) and growth in Africa. Overall, the results seem to provide support for the hypothesis of *growth by destination*— that where a country exports matters for the exporting country's growth and development—(Baliamoune-Lutz, *forthcoming*), in the sense that exports to more developed countries have (at least up to a threshold) a positive impact on growth but no such effect is unambiguously (unconditionally) shown in the case of exports to China.

This study aims to make a novel and significant contribution to the literature on growth and development in Africa. To the best of my knowledge, this is the first attempt to examine the impact of export destination on growth, focusing on Africa's exports to China and controlling for export concentration. The remainder of the paper is organized as follows. Section 2 briefly reviews the main characteristics of trade between Africa and China since 1995. Section 3 presents the variables and methodology. Section 4 discusses the estimation results. The final section summarizes and comments on the policy implications of the findings.

2. Trade between Africa and China: An overview

Africa-China trade has seen an impressive increase since 2000 (Figure 1). However, trade with China does not involve all African countries to a similar extent. China's major imports from Africa tend to be concentrated on a small group of countries. In 2008, 62 percent of Africa's trade with China involved five countries (China's major trade partners in Africa), Angola (24% of total Africa's trade with China), South Africa (17%), Sudan (8%), Nigeria (7%) and Egypt (6%). Figure 2 portrays the evolution of trade between China and each of the five countries over the period 1995-2008. We note that Angola and (since 2000) Sudan are

mainly exporters to China. On the other hand, Egypt and Nigeria are significant net importers, while South Africa seems to maintain a balanced trade with China. In terms of the proportion of trade with China in each country's GDP, the countries differ significantly. For example, in 2008, Angola's exports to China represented about 25 percent of its GDP, while Sudan's exports were about 11 percent of its GDP.

In general, exports from most African countries trading with China are predominantly from their top one or two commodities. In 2008, imports of crude oil from Africa constituted over 70 percent of total Chinese imports from the continent. More than 50 percent of total imports by China from Africa in 2008 came from two suppliers of crude oil, Angola (40%) and Sudan (11%). Indeed, crude oil represents nearly 100 percent of Angola's and Sudan's exports to China. Cotton constituted 100 percent of Burundi's exports to China. Even countries that export a variety of commodities to China, such as South Africa, have exports that are concentrated in a relatively limited group of commodities. The share of the top 5 exported commodities is generally around 70 percent (or higher) of their total exports to China. On the other hand, imports from China are quite diversified as African countries import a wide variety of Chinese products. In 2008 the top 20 exported commodities to Africa constituted only about 35 percent of China's total exports to the continent. The top 20 imported products imported (from China) by South Africa and Egypt accounted for a mere 34 percent of each country's total imports from China. For many other African countries this percentage is lower than 50 percent. Thus, a main feature of the Sino-African trade is the high concentration of African exports to China and strong diversification in Africa's imports from China. While it is expected that China will for many years to come continue to need primary commodities to implement its industrialization strategy, it is nonetheless interesting and useful to African policymakers to explore the growth effects of the growing trade with China, in the presence of high export concentration.

3. Export concentration and growth: A brief review

The structure of trade can be critical to long-term growth (Baliamoune-Lutz and Ndikumana, 2007). Some studies examined the effect of exporting manufactures on growth if all (or most) developing countries try to export manufactures—the fallacy of composition (Cline 1982, 1984, and 2008; Ranis, 1985; Martin; 1993). Others focused on the composition of exports and its impact on growth and development. For example, Hausmann, Hwang and Rodrik (2007) show that the specialization patterns of otherwise similar countries can result in differences in economic development. Mazumdar (1996) posits that the composition of trade is a major determinant of the strength of the 'engine of growth.' Other studies, including Lewer (2002), and Lewer and Van den Berg (2003) find evidence suggesting that countries that export consumer goods and import capital goods grow faster than those that export capital goods. In the case of Africa, as argued in Baliamoune-Lutz and Ndikumana (2007), this implies that “the recent export boom which is driven by capital-intensive sectors such as oil is not likely to generate growth that is sustainable, especially because of the low gains in employment creation and limited spillover effects on non-oil sectors.”

Hesse (2008) presents empirical evidence in support of a nonlinear link between export diversification and per capita income, with developing countries benefiting from diversifying their exports, whereas most advanced countries perform better with export specialization. Baliamoune-Lutz and Ndikumana (2007) find that export diversification enhances the growth effects of trade in Africa, especially at high levels of openness to trade. The authors note that the findings may suggest “diversification allows a country to sustain higher growth

by increasing its resilience to shocks due to, among others, the vagaries of international commodity markets and weather changes.” Similarly, Balamoune-Lutz (2009a) obtains empirical evidence suggesting that openness to trade may have adverse effects in fragile states (in Africa) in the presence of high export concentration. Carrère et al. (2009) find an inverted-U relationship between economic development and export diversification where the turning point occurs around \$24,000 per capita (PPP). This implies that there is a re-concentration of exports above a threshold income of \$24,000; i.e., in more developed countries. Finally, Agosin (2008) finds that export diversification alone and interacted with the volume of export has a highly significant positive impact in a sample including Asian and Latin American countries

Hausmann et al. (2007) show that, in the presence of (information) externalities, endowments may not fully determine a country’s specialization patterns. The authors develop a theoretical model where local cost discovery generates knowledge spillovers and show that specialization patterns become partly indeterminate, and conclude that the mix of goods that a country produces may have important implications for economic growth. They construct an index of the ‘income level of a country’s exports’ and use it to show that the empirical evidence validates their proposition; the index indeed predicts subsequent economic growth. Based on their findings, Hausmann et al. (2007) argue that “[c]ountries can get stuck with lower-income goods because entrepreneurship in cost discovery entails important externalities. Countries that are able to overcome these externalities—through policies that entice entrepreneurs into new activities—can reap the benefits in terms of higher economic growth” (p. 24).

However, other studies find that there is no evidence of a negative impact (Lederman and Maloney, 2003) or that the relationship between resource abundance and output level is actually positive (Ng, 2005). Countries like the United States, Finland and Sweden for example, successfully achieved growth as a result of natural resource-based production (Wright and Czelusta, 2002; Blomström and Kokko, 2003). Bebczuk and Berrettoni (2006) try to explain export diversification using data for 56 developed and developing countries including six African economies (Algeria, Egypt, Kenya, Morocco, South Africa and Tunisia) covering the period 1962-2002. Surprisingly, Bebczuk and Berrettoni find that variables such as exports, GDP, investment rate, credit, infrastructure, which are normally associated with good macroeconomic performance, “act in favor of more concentration rather than more diversification.” This result suggests that export concentration may increase with development

4. Empirical Analysis

4.1 Data and methodology

This paper uses variables that are typically used in growth equations (see for example Mankiw et al., 1992). In the growth literature, these variables include initial income (GDP) per-capita, investment (% of GDP), and an indicator of human capital. However, in the present study the latter is omitted because the data on our indicator of human capital (secondary schooling rate) are not collected on a regular basis for most countries and this makes the sample too small. In addition, the literature reports high correlation between initial income and human capital and this study controls for initial income. The study covers all African countries for which there are data on all the relevant variables. Unless otherwise

specified, Africa refers to the entire continent (including North Africa). A description of the variable is provided in Appendix A.

The growth equation used in this paper also accounts for the role of other relevant variables. First, I control for trade with China, using the share of exports and imports in the (African) country's GDP. This would help elucidate the first question I address in this study (do 'exports to China' promote growth in Africa?). I also control for openness to international trade (*open*) and for exports to the rest of the world (*exp_ROW*). In general, the existing empirical evidence does not provide unequivocal support for a positive impact of trade on growth, especially in the case of African countries. Recent empirical research shows either that trade liberalization is not significantly associated with growth or that trade liberalization may, in fact, have an adverse effect on growth (Mukhopadhyay, 1999; Baliaoune-Lutz, 2002 and 2009b; Rodriguez and Rodrik, 2001; Addison and Baliaoune-Lutz, 2006; Baliaoune-Lutz and Ndikumana, 2007). Mukhopadhyay (1999) finds that the liberalization of imports for some SSA countries caused growth to fall in the late 1980s and early 1990s. Baliaoune (2002 and 2009) finds that openness to trade in Africa led income in poorer countries to grow slower relative to higher-income countries, hence leading to income divergence, rather than convergence, within the continent. Thus, determining the overall effect of trade remains an empirical question. Second, I control for the quality of institutions and the quality of government using an indicator of the rule of law and an indicator of government effectiveness. There is a large body of empirical literature on the important role of institutions in development and growth (see for example, Rodrik et al., 2004, Acemoglu et al., 2003, Dollar and Kraay, 2003, and Baliaoune-Lutz, 2009a). Third, I control for the level of financial development in the country by including a measure of credit to the private sector (*credit*). While in theory financial development contributes positively to growth, and stylized facts show a positive correlation between the two, the empirical evidence on the direction of causality remains mixed. Fourth, I control for export concentration in primary commodities. There exists an important body of empirical work on the role of natural resources in development. In the case of Africa, most empirical studies find a negative relationship between natural resources and development (Humphreys, 2005; Collier and Hoeffler, 2004; Fearon, 2005; Baliaoune-Lutz and Ndikumana, 2007) through various channel, including low investment in education and infrastructure, conflict, corruption, and poor institutions. I use two indicators of export concentration: the ratio of primary products in the top 5 exports (*primary*) and a dummy variable for oil exporting (*oil*), taking the value of 1 if the country is a major oil exporter and zero otherwise. Including indicators of export concentration may provide evidence that could help answer the second question in this paper (does 'export concentration matter' to the relationship between export to China and growth?). If there is evidence for a significant positive impact of export diversification in Africa then this would suggest introduction of new exports could be a source of growth which would have significant implications for the need of advancement on the technological frontier and for trade policy, education reform, and the type of products imported by African countries.

I focus in particular on the relationship between growth in GDP per-capita and the share of exports to China as a ratio of the exporting country's GDP using the following basic model

$$y_{i,t} = \alpha y_{i,t-1} + \mathbf{X}_{i,t} \beta + \eta_i + \xi_t + \varepsilon_{i,t} \quad (1)$$

where y is growth income per capita in log form and \mathbf{X} is a row vector of the factors determining growth, some of which are endogenous, η_i is the individual (country) fixed

effect, ξ_t is a time-specific effect, and $\varepsilon_{i,t}$ are disturbances assumed (initially) to be serially uncorrelated.

This paper uses the Arellano-Bond GMM-DIF estimator to estimate the relationship between exports to China and growth in Africa, controlling for several relevant variables. Since we are using panel data we have to deal with random and fixed effects. The presence of random effects creates correlation between the error term and the lagged dependent variable. The Arellano-Bond GMM estimator (Arellano and Bond. 1991) minimizes this problem. It differences the endogenous and predetermined variables and uses lags of their own levels as instruments. We treat investment, openness to trade, exports to China, imports from China, exports to the rest of the world (developed countries), institutions and financial development as endogenous variables.

4.2 Estimation results

Table 1 shows the correlation coefficients among relevant variables. We note that the correlation between exports to China and growth (and initial income) in Africa is very weak (0.16), while the correlation of exports to China and the two indicators of institutional quality is significant and negative. There is a positive and statistically significant correlation between exports to China and openness (0.32) and export concentration (0.24). On the other hand, export to the rest of the world has a stronger association with initial income (exceeding 0.5), investment (0.32), openness (0.9) and positive, but weak in magnitude, correlation with institutional quality. Interestingly, the correlation between exports to China and exports to the rest of the world is only 0.28.

Table 2 reports the results from the Arellano-Bond GMM estimations. In the basic equations (columns 1 and 2) the focus is on trade with China distinguishing between imports and exports. The only coefficient that is strongly statistically significant (at the 1-percent level) is the one on imports to China, implying imports to China have a positive influence on growth in Africa. Interestingly, exports to the rest of the world (*exp_ROW*) do not appear to have an impact (including imports—not shown—from the rest of the world does not change the results). In columns 3 and 4, I account for the effect of export concentration in primary commodities (including crude oil). Again, there is no evidence that exports to China have a positive impact. In fact the coefficient on the variable '*exp_to_China*' is negative (in all four equations) but statistically insignificant. Surprisingly, export concentration seems to have a positive effect on growth. The coefficient on the variable *primary* is positive and significant at the 10-percent level. In column (5), I include the interplay of exports to China and export concentration. The results indicate that higher export concentration actually enhances the growth effects of exporting to China. The independent effect from exporting to China is negative and statistically significant at the 10-percent level.

The results reported in Table 3 are from estimations including a dummy variable for oil exporters (*oil*) instead of the variable *primary*. The results regarding the growth impact of China-bound exports are similar to the ones reported in Table 2. There is no direct (independent) positive effect from exporting to China. Exporting crude oil, in general, has a negative impact. This result is consistent with the evidence in the empirical literature on growth and natural resources in Africa. However, the growth effects in countries that export primarily crude oil to China are positive. This seems consistent with the recent growth in oil exporting countries, since we observe high GDP growth in countries that have high volume of exports of crude oil to China, such as Angola and Equatorial Guinea.

Further specifications are carried out in order to test the robustness of these results. In the equations shown in column (1) under the headings '*CON = primary*' and '*CON = oil*' in Table 4, and after dropping most of the insignificant variables (estimating the same equations with these variables does not change the results), I try to assess the presence of nonlinearities by including the squared export to China and the squared export to the rest of the world. The results indicate that no matter which measure of concentration is used, there is no evidence of this type of nonlinearity in the case of export to China. On the other hand, the statistical evidence suggests an inverted-U relationship between exports to the rest of the world and growth in African countries. In column (2) under both headings, I include time dummies but the coefficient associated with '*time*' is statistically insignificant. We note that the coefficient on the variable *invest* (investment ratio) now has better statistical significance. In addition, there is some evidence that there may be a growth momentum, as the coefficient on the lagged dependent variable (growth) is positive and significant at the 10-percent level. Importantly, the evidence related to the impact of trade with China is quite robust.

5. Summary and policy implications

Four important results are obtained from the empirical analysis. First, there is no empirical evidence that exports to China enhance growth unconditionally, while there is strong evidence that exporting to OECD countries has a positive impact on growth in Africa. This seems to provide support for the hypothesis of *growth by destination* (i.e., that where a country exports matters for the exporting country's growth and development) in the sense that exports to more developed (OECD) countries is (at least up to a threshold) growth enhancing but no such effect is unambiguously (unconditionally) shown in the case of exports to China. Second, the evidence suggests that export concentration enhances the growth effects of exporting to China. This implies that countries which export primary products to China (such as Angola or Sudan) benefit more (in terms of growth) than countries which have more diversified exports (such as South Africa). Third, contrary to the widely held view that increased imports from China would have a negative impact on growth in Africa, the empirical results indicate that the share of China in a country's total imports has a robust positive effect on growth. Finally, the evidence suggests that there is an inverted-U relationship between exports to the rest of the world and growth in Africa. This last result should raise concern, as it suggests that above a threshold level, the effect of exports on growth is negative, which is particularly significant as African countries further increase their exports to China. Using the results in Table 2, it turns out that the turning point occurs when exports are 67% of GDP (or 70% using the results in Table 3). The list of countries that had a share of exports greater than two-thirds of GDP for three or more years during the period 1995-2008 includes Angola, the Republic of Congo, Equatorial Guinea, Seychelles, and Swaziland.

The statistical evidence suggests that trade with China has an ambiguous effect. The results also suggest that the effects would be different for different countries, which has been stated in other studies (see, for example, Jenkins and Edwards, 2006). Interestingly, there is a significant positive (linear) effect from importing from China and it works (at least partly) through investment (see Table 5). This seems to be consistent with the evidence in the empirical literature on African countries (see for example Maswana, 2009). Thus, African policymakers should promote policies that aim at facilitating imports of investment (and investment aiding) goods from China. Equatorial Guinea, for example, already has over 70% of its imports from China in this type of goods.

On the other hand, the effect from exporting to China is more complicated. The evidence derived in this paper indicates that only countries with highly concentrated exports seem to benefit from exporting to China. Does this mean that African countries should stay away from diversifying their exports to China? Or should Africa join other developing and emerging countries and boost the manufacturing sector? These are important policy questions that in order to be seriously tackled will very likely require different strategies for different countries in the continent.

While the diversification of trading partners may, in theory, be good as it could minimize the risk of relying on a very small number of export markets, its benefits may be greatly diminished (or reversed) in the presence of high export concentration in natural (especially non-oil) resources. On the other hand, the experience of many Latin American countries with diversification clearly shows that the relationship between diversification and growth is not automatic, as Latin America has for the most part failed to replicate the export-led growth of Asia's (fast-growing) emerging economies. Interestingly, Lall et al. (2005) find that on the aggregate export sophistication does not have a strong relationship with growth rates. Moreover, exporting manufacturing products may require a strong trade capacity—to sell products in developed countries—which is still lacking in many African countries. Rankin et al. (2006) use micro-data from manufacturing firms in Ghana, Kenya, Nigeria, South Africa and Tanzania and explore the causes of poor exporting performance. The authors find that firm size is a robust determinant of the decision to export and find foreign ownership and skills to be significant determinants of exporting. Given that skilled labor is still in short supply, many African countries may find it difficult to boost export diversification through promoting manufacturing. In addition, the dependence on primary product export can be linked to low absorptive capacity (Habiyaemye and Ziesemer, 2006; Wood and Mayer, 2001). Thus, with the exception of countries that are already on a somewhat steady path of manufacturing-based export diversification (e.g., South Africa, Mauritius and Tunisia), African countries should try to explore other ways of boosting exports. For example, enhancing agriculture through adoption of new technologies should be high on the list of options for a number of African countries. Chandra and Osorio Rodarte (2007) argue that “Ghana's path to a middle income status does not have to be paved with only manufactured products.” The authors suggest that a policy challenge for Ghana is to facilitate a “comprehensive package of sector specific policies dedicated to fostering the technological capabilities and specific nontradable public inputs.” Indeed, African countries may need to pursue what Brenton et al. (2007) identify as a policy portfolio approach to export diversification, involving the expansion of the range of markets into which existing products are sold (geographic diversification, including regional markets), the upgrading of the quality of existing products, including agricultural exports, and expanding the export of services.

It is important to note that the widely held claim that trade with (and FDI from) China may be exacerbating the poor levels of institutional quality and governance in Africa (see Tull, 2006; quoted on page 1 of this paper) seems to miss a crucial point: Africa seriously needs to develop its infrastructure and China seems willing (in exchange for trade relations) to provide significant contribution in this area. Since their independence, many African countries have gone through decades of very low investment in infrastructure and other crucial sectors of the economy. Quite often, aid conditionality played a role in this situation. No wonder then that when China offers aid and investment projects without the traditional types of conditionality, many African leaders (and their citizens) are happy to accept. As noted by a spokesman of the Kenyan government, “[y]ou never hear the Chinese saying that they will not finish a project because the government has not done enough to tackle

corruption. If they are going to build a road, then it will be built “(cited in *USA Today* on June 6, 2005).

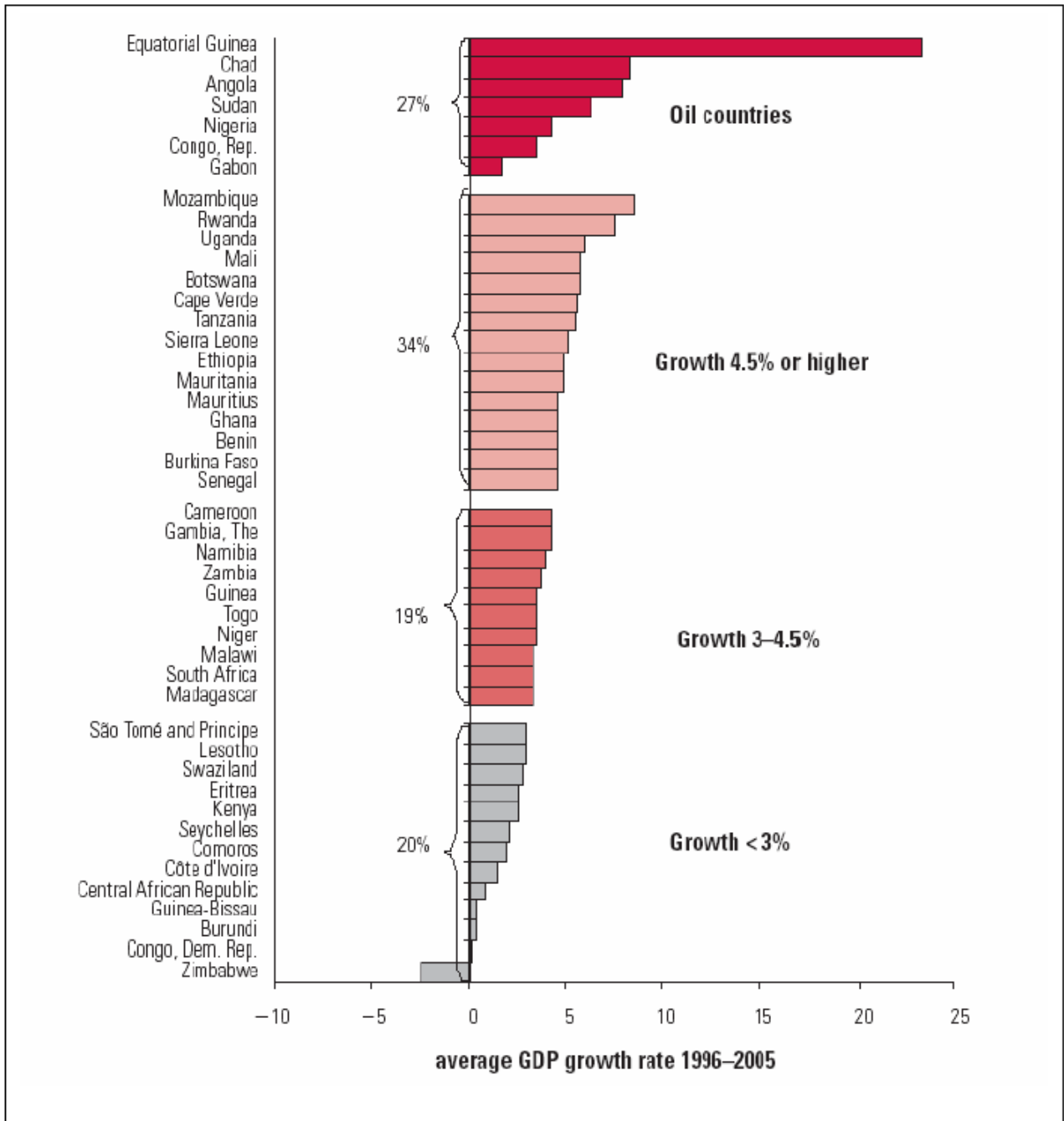
In a recent study of Africa’s growth turnaround, John Page (2009) argues:

The fall in economic declines since 1995 is largely due to better macroeconomic policies, but changes in such “growth determinants” as investment, export diversification, and productivity have not accompanied the growth boom. Lack of change in these variables—and the significant role played by natural resources in sparking growth accelerations—suggest that Africa’s growth recovery was fragile, even before the recent global economic crisis.

Thus, Africa’s trade and investment relationships with China should be aimed at enhancing infrastructure, human capital, and investment. Africa should promote production sectors capable of absorbing the large surplus of unskilled labor but at the same time invest in the creation of human capital (skilled labor). African countries should exploit their position (and their growing market power) as world suppliers of much-needed primary commodities, and identify the type of natural resource management, export sophistication, and skill enhancement that would promote long-term growth.

Appendix B

Figure B1. Average GDP growth in Africa (exc. North Africa)



Source: Broadman (2006, p. 7)

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Appendix A

Variable description

Growth: Growth in GDP per capita, purchasing power Parity (ppp) value using (international \$).

exp_to_China: The share of exports to China in GDP (%), from UN-COMTRADE.

Imp_from_China: The ratio of imports from China from GDP (%), from UN-COMTRADE

Invest: Gross fixed capital formation as a ratio of GDP (%).

Open: The sum of total imports and exports to GDP (%).

Credit: The ratio of domestic credit to the private sector (%).

income80: 1980 real income (GDP, ppp) per capita in log form.

income90: 1990 real income (GDP, ppp) per capita in log form.

gov_eff: Index of government effectiveness, from the World Bank database on governance.

law: Index of the rule of law, from the World Bank database on governance.

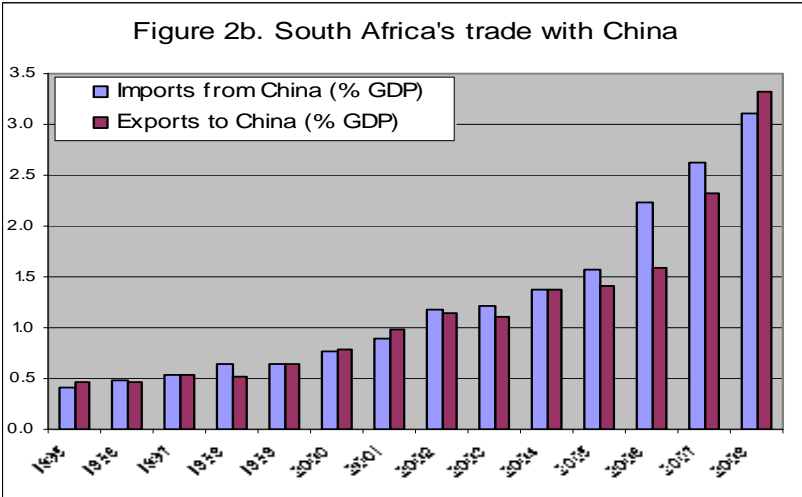
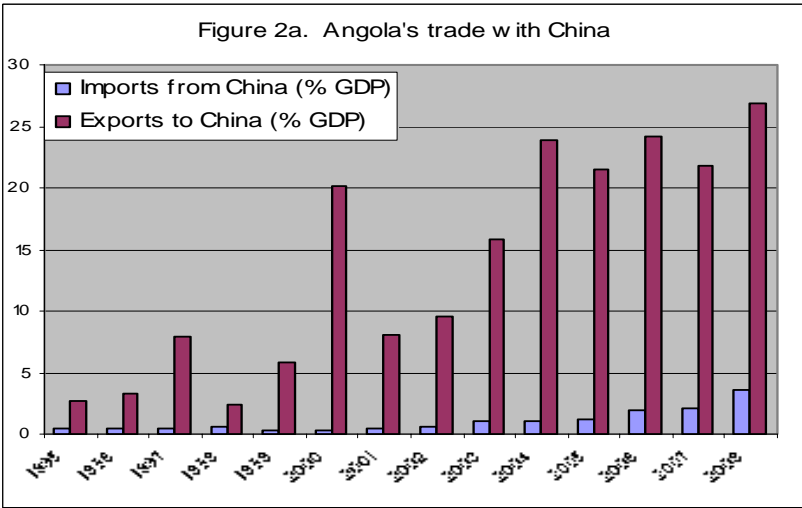
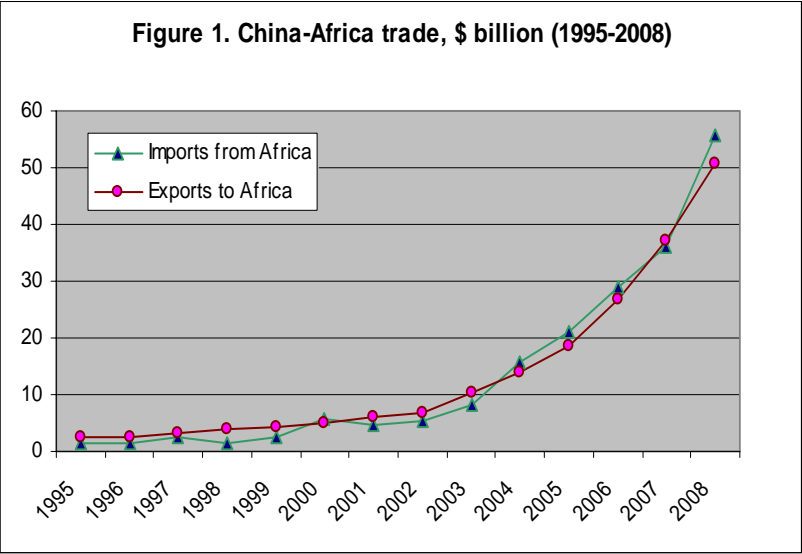
primary: The ratio of primary products in the country's top 5 exports.

Exp_ROW: The ratio of exports to OECD countries to GDP (%), from UN-COMTRADE

north: Dummy variable taking the value of 1 if the country is in North Africa and zero otherwise.

oil: Dummy variable taking the value of 1 if the country is an oil exporter and zero otherwise.

Source: Unless noted otherwise, all data are from the World Bank World Development Indicators database.



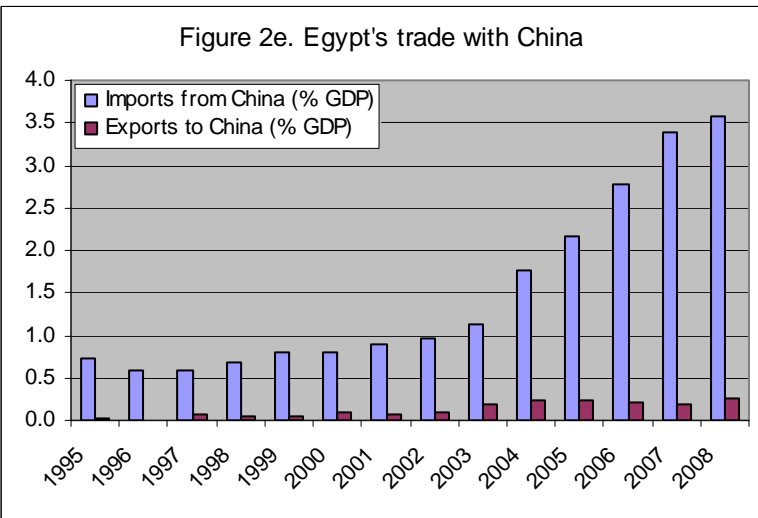
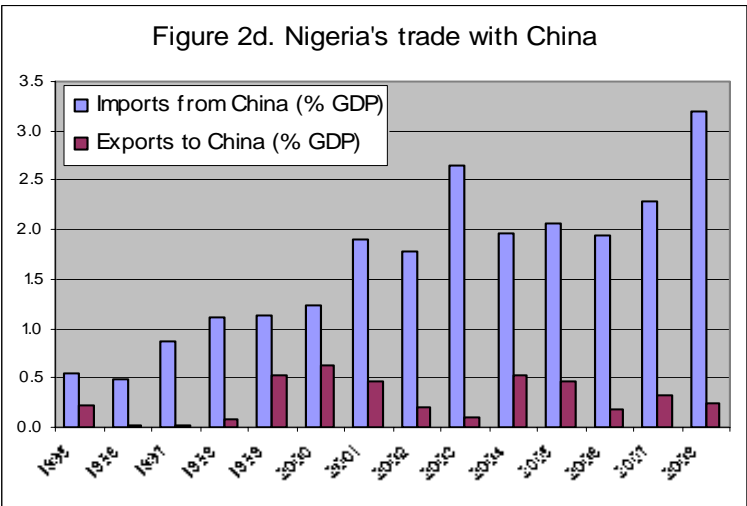
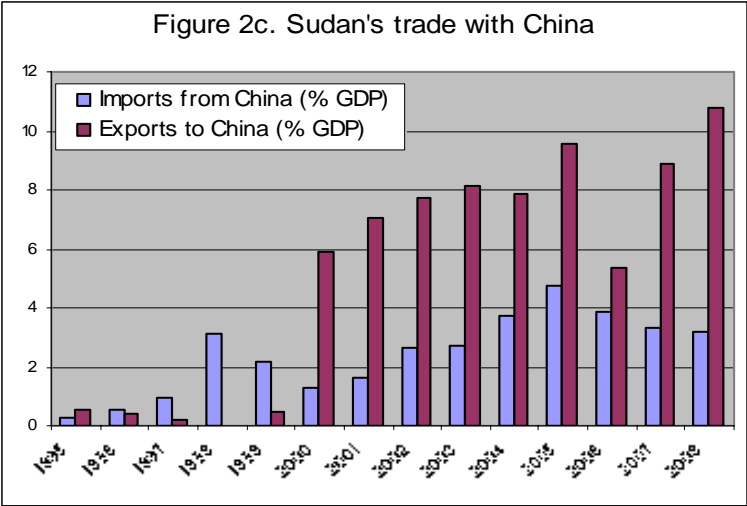


Figure 3a. Exports to the world, excluding China, and growth in Africa

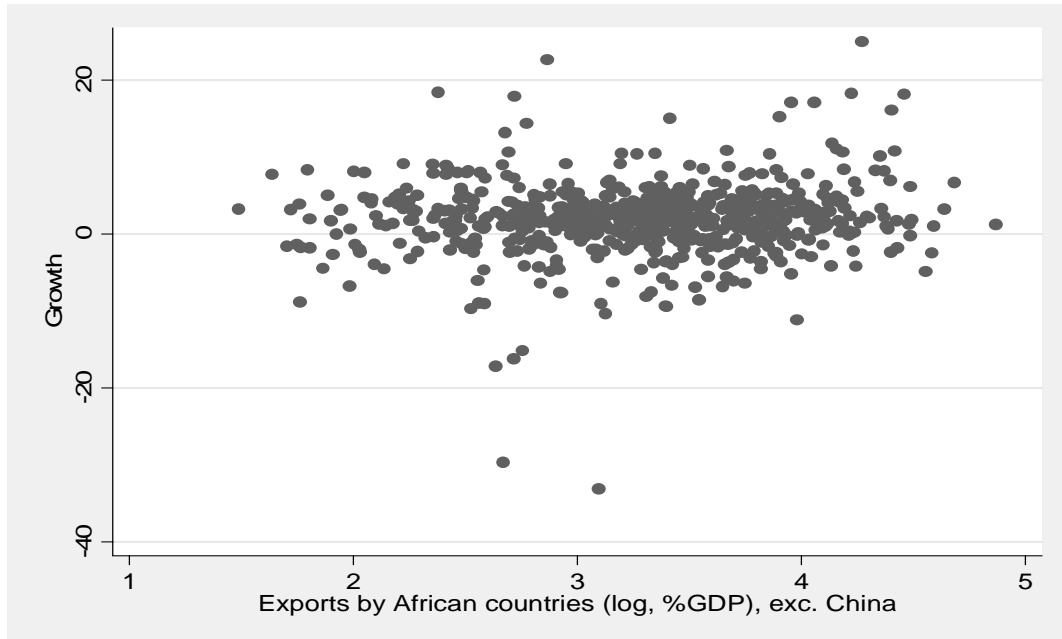


Figure 3b. Exports to China, and growth in Africa

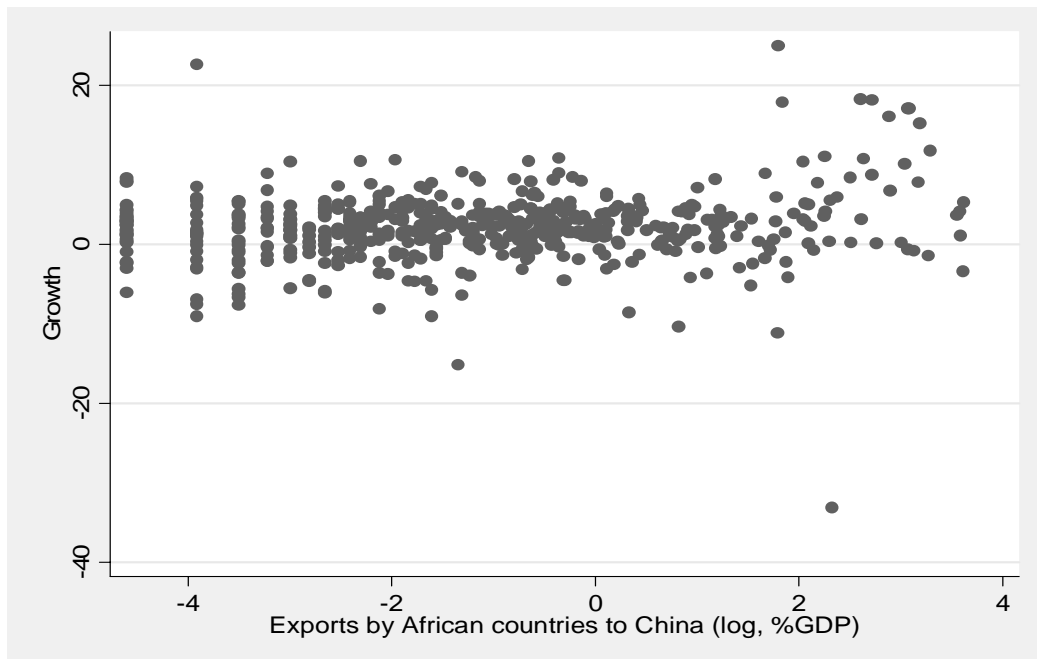


Figure 3c. Imports from China and growth in Africa

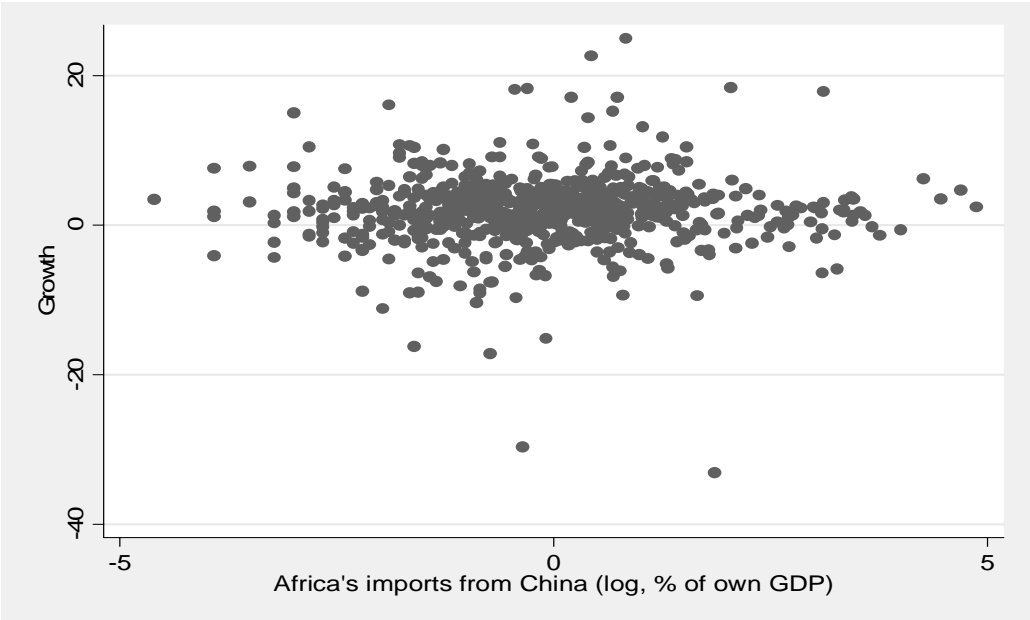


Table 1. Correlations

	<i>exp_to_China</i>	<i>imp_from</i> <i>-China</i>	<i>growth</i>	<i>invest</i>	<i>open</i>	<i>credit</i>	<i>income80</i>	<i>income90</i>	<i>gov_eff</i>	<i>law</i>	<i>primary</i>
<i>imp_from-China</i>	-0.01										
<i>growth</i>	0.16	0.01									
<i>invest</i>	0.19	-0.01	0.33								
<i>open</i>	0.32	0.09	0.15	0.54							
<i>credit</i>	-0.00	-0.01	0.05	0.19	0.18						
<i>income80</i>	0.13	-0.09	-0.01	0.22	0.34	0.33					
<i>income90</i>	0.09	-0.12	0.01	0.17	0.40	0.30	0.96				
<i>gov_eff</i>	-0.23	-0.12	0.18	0.32	0.17	0.56	0.37	0.43			
<i>law</i>	-0.31	-0.06	0.10	0.41	0.21	0.47	0.32	0.38	0.84		
<i>primary</i>	0.24	0.04	0.10	0.03	0.09	-0.19	0.01	-0.02	-0.17	-0.17	
<i>exp_ROW</i>	0.28	-0.038	0.11	0.32	0.90	0.19	0.50	0.57	0.19	0.19	0.13

Table 2. GMM estimates

Dependent variable = **growth in per-capita GDP** (*growth*)

	(1)	(2)	(3)	(4)	(5)
<i>growth (lagged)</i>	0.076 (0.074)	0.082 (0.074)	0.073 (0.076)	0.079 (0.076)	0.087 (0.075)
<i>exp_to_China</i>	-0.039 (0.134)	-0.065 (0.143)	-0.035 (0.136)	-0.059 (0.145)	-2.452* (1.137)
<i>imp_from-China</i>	0.381*** (0.130)	0.396*** (0.130)	0.363*** (0.135)	0.378*** (0.136)	0.413*** (0.137)
<i>invest</i>	0.117* (0.069)	0.110 (0.067)	0.127* (0.071)	0.122* (0.068)	0.119* (0.068)
<i>open</i>	0.002 (0.029)		0.0303 (0.030)		
<i>credit</i>	-0.027 (0.069)	-0.030 (0.069)	-0.021 (0.070)	-0.025 (0.071)	-0.016 (0.070)
<i>Income1980</i>	0.079 (0.167)	0.096 (0.163)	0.101 (0.171)	0.116 (0.168)	0.152 (0.169)
<i>gov_eff</i>	0.079 (0.082)	0.081 (0.083)	0.035 (0.087)	0.036 (0.087)	0.031 (0.088)
<i>law</i>	-0.101 (0.095)	-0.106 (0.096)	-0.112 (0.100)	-0.117 (0.101)	-0.113 (0.100)
<i>NorthAfrica</i>	-0.004 (0.416)	0.057 (0.423)	0.049 (0.423)	0.104 (0.429)	0.102 (0.428)
<i>exp_ROW</i>		-0.027 (0.053)		-0.025 (0.054)	-0.042 (0.055)
<i>primary</i>			2.516* (1.372)	2.486* (1.372)	2.201 (1.379)
<i>primary X exp_to_China</i>					2.451* (1.437)
<i>exp_to_China squared</i>					
<i>exp_ROW squared</i>					
Obs.	201	201	193	193	193
Arellano-Bond test [pr>z]	-0.94 [0.35]	-0.91 [0.36]	-1.07 [0.28]	-1.04 [0.30]	-1.02 [0.31]

All specifications pass the Sargan test (not reported).

Equations are estimated with a constant (not shown).

Standard errors are in parentheses

*, ** and *** represent significance at the 10-percent, 5-percent and 1-percent levels, respectively.

Table 3. GMM estimation
controlling for oil

Dep. Variable: **growth in per-capita GDP** (*growth*)

	(1)	(2)	(3)	(4)	(5)
<i>growth</i>	0.059 (0.073)	0.061 (0.074)	0.060 (0.073)	0.061 (0.074)	0.063 (0.074)
<i>exp_to_China</i>	0.029 (0.134)	0.017 (0.147)	-0.552* (0.304)	-0.540 (0.328)	-0.559* (0.328)
<i>imp_from-China</i>	0.376*** (0.126)	0.382*** (0.129)	0.285** (0.129)	0.290** (0.138)	0.291** (0.138)
<i>invest</i>	0.090 (0.065)	0.086 (0.067)	0.086 (0.067)	0.092 (0.072)	0.086 (0.067)
<i>credit</i>	-0.047 (0.069)	-0.048 (0.069)	-0.026 (0.069)	-0.026 (0.070)	-0.025 (0.070)
<i>Income1980</i>	0.126 (0.155)	0.133 (0.159)	0.138 (0.159)	0.038 (0.166)	0.025 (0.169)
<i>gov_eff</i>	0.082 (0.081)	0.083 (0.082)	0.080 (0.081)	0.080 (0.082)	0.079 (0.081)
<i>law</i>	-0.112 (0.094)	-0.113 (0.095)	-0.102 (0.094)	-0.101 (0.095)	-0.105 (0.095)
<i>oil</i>	-0.835** (0.405)	-0.823** (0.410)	-1.010** (0.411)	-1.013** (0.411)	-1.020** (0.420)
<i>exp_ROW</i>		-0.011 (0.051)	-0.004 (0.052)	-0.006 (0.054)	-0.006 (0.054)
<i>oil X exp_to_China</i>			0.685** (0.321)	0.669* (0.341)	0.691** (0.324)
<i>oil X exp_ROW</i>				0.007 (0.053)	
<i>North Africa</i>					0.174 (0.420)
<i>exp_to_China squared</i>					
<i>exp_ROW squared</i>					
Obs.	201	201	201	201	201
Arellano-Bond test [pr>z]	-1.02 [0.31]	-1.01 [0.31]	-0.92 [0.36]	-0.94 [0.35]	-0.92 [0.36]

All specifications pass the Sargan test (not reported).

Equations are estimated with a constant (not shown).

Standard errors are in parentheses

*, ** and *** represent significance at the 10-percent, 5-percent and 1-percent levels, respectively.

Table 4. GMM estimation
Robustness checks

Dep. Variable: **growth in per-capita GDP (PPP)**

	<i>CON = primary</i>		<i>CON= dummy for oil</i>	
	(1)	(2)	(1)	(2)
<i>growth</i>	0.081* (0.043)	0.075* (0.043)	0.077* (0.043)	0.070 (0.044)
<i>exp_to_China</i>	0.124 (0.201)	0.174 (0.199)	0.197 (0.204)	0.245 (0.203)
<i>imp_from-China</i>	0.229** (0.101)	0.214** (0.101)	0.219** (0.101)	0.206** (0.101)
<i>invest</i>	0.094** (0.043)	0.098** (0.043)	0.101** (0.043)	0.104** (0.043)
<i>Income1980</i>	0.071 (0.065)	0.043 (0.064)	0.096 (0.066)	0.072 (0.065)
<i>CON</i>	1.396* (0.792)	1.518* (0.789)	-0.356* (0.212)	-0.376* (0.212)
<i>exp_ROW</i>	0.227*** (0.074)	0.235*** (0.074)	0.266*** (0.076)	0.273*** (0.076)
<i>exp_to_China squared</i>	-0.003 (0.005)	-0.004 (0.006)	-0.0023 (0.006)	-0.003 (0.005)
<i>exp_ROW squared</i>	-0.0017*** (0.0005)	-0.0017*** (0.0005)	-0.0019*** (0.0005)	-0.0020*** (0.0006)
<i>time</i>		0.035 (0.031)		0.034 (0.032)
Obs.	418	418	418	418
Arellano-Bond test [p>z]	-0.14 [0.89]	-0.21 [0.83]	-0.19 [0.85]	-0.25 [0.80]

All specifications pass the Sargan test (not reported).

Equations are estimated with a constant (not shown).

Standard errors are in parentheses

*, ** and *** represent significance at the 10-percent, 5-percent and 1-percent levels, respectively.

Table 5. GMM estimation

Dep. Variable: **Investment ratio**, % GDP (invest)

	(1)	(2)	(3)
<i>invest</i>	0.379*** (0.040)	0.379*** (0.041)	0.387*** (0.041)
<i>growth</i>	0.024 (0.046)	0.027 (0.047)	0.029 (0.046)
<i>exp_to_China</i>	-1.058 (0.091)	-0.088 (0.091)	-0.190* (0.097)
<i>imp_from-China</i>	0.235*** (0.089)	0.243*** (0.090)	0.331*** (0.092)
<i>credit</i>	0.003 (0.049)	0.004 (0.050)	0.033 (0.049)
<i>Income1990</i>	0.438*** (0.112)	0.392*** (0.106)	0.359*** (0.110)
<i>law</i>	0.276*** (0.053)	0.273*** (0.054)	0.244*** (0.054)
<i>oil</i>	-12.190*** (1.967)	-11.872*** (1.964)	-9.734*** (2.118)
<i>North Africa</i>	-0.427 (0.319)		
<i>time</i>		0.031 (0.107)	
<i>exp_ROW</i>			-0.303*** (0.077)
<i>exp_ROW squared</i>			0.0017*** (0.0005)
Obs.	243	243	243
Arellano-Bond test [pr>z]	-1.55 [0.12]	-1.53 [0.13]	1.53 [0.11]

Adapted from Balamoune-Lutz (*forthcoming*).

All specifications pass the Sargan test (not reported).

Equations are estimated with a constant (not shown).

Standard errors are in parentheses

*, ** and *** represent significance at the 10-percent, 5-percent and 1-percent levels, respectively.