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Julius A. Agbor and Olumide Taiwo

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Julius A. Agbor† and Olumide Taiwo‡

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Abstract

This study investigates the drivers of competitiveness in African economies. While the macroeconomic perspective focuses on the behavior of the real effective exchange rate (REER), and the international competition framework emphasizes export market shares (EXPS), the business strategy framework emphasizes high-value production by means of domestic and foreign factors in a way that is consistent with global supply chains. In this paper, we assess competitiveness in the business strategy framework through a Trade-Weighted Value added index (TWV). The empirical section estimates fixed effects models explaining the measures of competitiveness by a set of factors using a panel dataset of African countries during 1980-2010. The results show that the TWV is the most consistent with the framework underlying the Global Competitiveness Report (GCR) in comparison with the other measures. Evidence based on the TWV suggests that the CFA franc zone economies are not less competitive than their sub-Saharan African counterparts as the exchange rate framework suggests. Indeed, movements in the REER are the least connected to the components of the GCR. The evidence also suggests that although there is no one-size-fits-all prescription for improving competitiveness in African economies, human capital stands out as a fundamental driver. In terms of policy, African states need to invest importantly in human capital, maintain a stable macroeconomic framework, while actively pursuing a

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†(Corresponding author): Alcohol and Tobacco Tax & Trade Bureau/Energy Enterprise Solutions, Washington DC. Department of Economics, Stellenbosch University, South Africa. Email: jabor1970@gmail.com

‡Center for the Study of the Economies of Africa (CSEA), Abuja Nigeria. Email: otaiwo@gmail.com

number of regional and structural-context specific non-price competitiveness enhancing policies.

1 Introduction

The concept of international competitiveness has gained prominence in both policy and academic circles specifically in the search for factors that are necessary to ensure external macroeconomic performance, sustained economic growth, and improvement in living standard of the population (Ramirez and Tsangarides 2007). This search is particularly important for African economies, most of which are small open economies aiming to provide their citizens with opportunities to improve their living standards and quality of life through employment and productivity gains.

Scott (1985) defines competitiveness as "a nation state's ability to produce, distribute, and service goods in the international economy in competition with goods and services produced in other countries, and to do so in a way that earns a rising standard of living". In Fagerberg (1988)'s view, competitiveness refers to the ability of a country to achieve the twin goals of raising the living standards of its citizens by way of sustained growth in income and employment, and doing so without running into balance of payment difficulties. The OECD Program on Technology and the Economy (1992) defines competitiveness as "the degree to which, under open market conditions, a country can produce goods and services that meet the test of foreign competition while simultaneously maintaining and expanding domestic real income" (p. 237).

These definitions emphasize two important points. First, competitiveness in exports does not translate into national competitiveness if it is not accompanied by rising standard of living. That is, being the most efficient producer of internationally traded goods does not automatically translate into rising living standards of a population (Reinert 1995). Second, the definitions emphasize strategic competitive advantage achieved through high value addition and economies of scale rather than comparative advantage based on resource endowments.[1] We take these issues seriously.

The economic literature on competitiveness in Africa is focused mainly on the CFA franc zone, principally due to the fixed exchange rate regime operational in those countries, and assesses competitiveness through the REER. This practice (of assessing competitiveness) anchors on two premises namely 1) that a low REER attracts foreign demand and increases a country's share of world market, which in turn leads to improvement in external positions, 2) the resulting consequence of rising incomes in the traded sectors of the economy would enforce labor migration from the non-traded sectors, thereby ensuring that external performance translates into rising domestic living standards. However, recent experiences with rising unemployment, rising inequality and unyielding poverty rates despite strong external performance, macroeconomic stability and

[1] This also marks a distinction between the emphasis on increasing returns to scale in the new trade theory and comparative advantage in the conventional trade theory.

impressive economic growth in many African countries suggest implausibility of these assumptions.

In addition to these challenges, the emergence of global value chains manifested in growing trade in intermediate goods poses an analytical challenge to the framework. While the framework assumes that final goods are produced entirely by domestic factors of production, movement of intermediate goods across boundaries imply that final goods traded by a country could reflect both domestic and foreign factors of production. This development has two implications for assessment of competitiveness. First, the growing trade in intermediate goods aided in part by multinational corporations contributes to weakening the sensitivity of exports to exchange rates, further limiting the utility of the macroeconomic framework. Second, competitiveness needs to be evaluated more on the basis of value addition than on exchange rates.

In this paper, we explore the business strategy framework of competitiveness that circumvents the assumptions of the macroeconomic framework and emphasizes the factors that enable value addition. We analyze the generalized double diamond model[2] and adopt the TWV proposed by Agbor and Taiwo (forthcoming) in measuring competitiveness. In the empirical section, we estimate models consistent with the diamond model and compare the performance of TWV, REER and EXPS using panel data for a sample of African countries spanning 1980-2010.

While emphasizing a "no-size-fits-all" approach, our empirical findings show that human capital is central to competitiveness. The evidence also suggests that when alternate measure of competitiveness emphasizing value addition is taken into account, CFA franc zone economies are not necessarily less competitive than their sub-Saharan African counterparts. The policy prescription to improve competitiveness is that African states need to invest importantly in human capital, maintain a stable macroeconomic framework, while actively pursuing a number of regional and structural-context specific non-price competitiveness enhancing policies.

The remainder of the paper is structured as follows. Section 2 reviews the literature and compares alternative competitiveness frameworks. Section 3 outlines the theoretical competitiveness framework and examines the suitability of each index while section 4 presents the empirical framework. Section 5 discusses the empirical findings and section 6 concludes the study.

2 Literature Review

Three major perspectives on competitiveness have been identified in the literature namely, macroeconomic, international competition, and business strategy perspectives. A discussion of these frameworks and their merits follow below.

[2] The model is an extension of Porter (1990) which underlies the annual competitiveness rankings including the Global Competitiveness Report (GCR) of the World Economic Forum (WEF), the World Competitiveness Scoreboard of the International Institute for Management Development (IIMD) as well as the African Competitiveness Report (ACR).

2.1 The Macroeconomic or Exchange Rate Perspective

The macroeconomic perspective originated from macroeconomic theory and policy and is influenced by the framework outlined in Corden (1994) and Boltho (1996). In the framework, competitiveness entails maintaining internal and external balance in the short-run (Wignaraja 2005). Internal balance is usually defined in terms of full employment (the lowest possible rate of unemployment that is consistent with an acceptable rate of inflation) while external balance is defined in terms of current account equilibrium (or some desirable level of the current account). In this context, international competitiveness is defined as the level of the real exchange rate that, in combination with the requisite domestic economic policies, achieves internal and external balance (Boltho 1996). Thus, competitiveness policy is synonymous with exchange rate policy and competitiveness is assessed through the real exchange rate. This approach emphasizes the exchange rate as the strategic variable and hinges on the link between the real exchange rate, balance of payments, resource allocation across sectors and competitiveness. For example, large current account deficits are related to exchange rate appreciations which in turn hamper the development of tradables including manufactured exports (Wignaraja, 2005).

Economic theory (in particular trade theory) defines the real exchange rate as the ratio of domestic prices of non-tradables to tradables, $e = p_n/p_t$. An increase in the ratio denotes an appreciation of the exchange rate while a decrease denotes depreciation. However, this definition of the real exchange rate faces two empirical challenges. First, because the measure uses domestic prices, it lumps exports and imports into the same category as tradables. Boltho (1996) argues that the measure is only appropriate for small open economies where the terms of trade are set by the world market. Second, regular data on tradable and non-tradable prices are hardly available (Wignaraja 2005; Boltho 1996). These challenges have led scholars to rely on proxies for the real exchange rate.

The first set of proxies is indicators of relative consumer prices. These include the Consumer Price Index (CPI) and other indices relating to the cost of living, and are readily available in most countries. However, the drawbacks associated with these measures are: inclusion of a range of goods and services that are not subject to international competition such that components and their weights vary across countries. Relative indicators based on GDP deflators are sometimes used as alternatives but these also beset by the same limitations.

The second set of proxies are those measuring relative producer prices of traded manufactured goods and are usually collected from declarations at the customs. Although these measures have some merits in the sense that the data is easy to collect and they relate to actual trade, they also suffer many setbacks. First, by focusing on actual trade, they ignore potential trade and therefore fail to cover all tradable goods and sectors. Such exclusion may be problematic by not taking into account possible loss of competitiveness of excluded goods as they become too highly priced to be traded. Second, there are variations in the quality of the measures across countries as well as lack of homogeneity in weighting and coverage. These shortcomings make international comparisons

less meaningful. Third, changes in competitiveness tend to be heavily influenced by changes in prices of intermediate goods. Fourth, by focusing on relative price changes, these indices are only meaningful in markets with differentiated products. In perfectly competitive settings where prices are given, competitiveness manifests in terms of profits rather than prices (Boltho, 1996).

The third set of proxies is those measuring relative costs. The most commonly used is the index of Unit Labor Cost (ULC) in the manufacturing sector, defined as labor cost per unit of manufactured output. The advantage of this measure is that improvements in competitiveness, through increase in labor productivity, fall in wages or nominal exchange rate depreciation, are associated with "either declines in tradable prices or with increases in profitability, or with a mixture of the two, depending on what strategies firms follow and on the nature of the markets in which they compete" (Boltho 1996, p.3). The challenge with the ULC is that it is an aggregate concept that focuses on labor cost and productivity while ignoring other costs of production. This selective focus on labor is justified on two grounds. First, it is assumed that all non-price factors and other costs relevant to competitiveness are embodied in the production function and are therefore captured in labor productivity.[3] However, Monga (2013) argues that if things were that simple and levels of transaction costs induced by non-price factors are unimportant, then manufacturing firms would have been moving from China, Brazil and other emerging economies where unit labor costs are already rising into low-wage labor intensive African countries such as the Democratic Republic of Congo, Ethiopia and Tanzania. Second, it is argued that labor costs are more important determinants of competitiveness than the cost of capital and other inputs that are assumed to be equalized across countries through international trade. For example, Boltho (1996, p.3) argues that "cost of capital and other raw materials will be more similar across countries due to capital mobility and the existence of international commodity markets." However, although the assumption of capital mobility may hold among the group of industrialized countries, extending it to the global economy may be implausible given higher cost of capital in less developed countries than industrialized countries.

The idea that increases in a country's relative ULC leads to loss of competitiveness could be weaker than portrayed for many reasons. For example, differential changes in non-labor costs will affect competitiveness but might not be reflected in ULC. Also, higher capital-labor ratio, which entails higher capital costs and lower labor costs, could lead to relative ULCs that overstate competitiveness.[4] Fagerberg (1988) notes that countries which achieved the fastest growth in terms of exports and GDP in the early post-war period were those that also experienced much faster growth in relative ULC. This phenomenon, referred to as "Kaldor's Paradox" in reference to Kaldor (1978), implies that the focus on relative unit labor costs as an important determinant of competitiveness is rather too simplified, and could be sometimes misleading.

[3] These include other costs of doing business notably those related to the state of infrastructure, institutions, access to capital, quality of human capital and governance institutions.

[4] This insight is credited to Scott Rogers.

In addition to these shortcomings, recent developments in global trade, notably the growing importance of global value chains, are challenging the validity of conventional measures of REER. The models underlying the REER assume that final goods traded in international markets are wholly produced by domestic factors (and therefore ignore trade in intermediate goods) which explains why competitiveness has been measured using domestic consumer prices and gross trade data. The increasing prominence of trade in intermediate goods arising from globalization of value chains imply that competitiveness needs to be evaluated both on the basis of value addition and on prices reflecting also the cost of intermediate inputs.

There have been two major efforts to revise the macroeconomic framework in the light of these developments. Bems and Johnson (2012) proposes a Value-Added Real Effective Exchange Rate (VAREER) that uses value-added trade and prices of factors of production with a view to tailoring the assessment toward competitiveness in the segment of the value chain (denoted as "tasks") that drives a country's trade in international markets. Further, Bayoumi et al (2013) proposes a Goods Real Effective Exchange Rate (GOREER) that is a product of two components. One component measures competitiveness in domestic value-added content of goods traded while the other measures competitiveness in foreign value added content. Saito et al (2013) examines the two measures and concluded that they both exhibit tradeoffs in different contexts.

Notwithstanding, the macroeconomic framework of competitiveness faces four principal limitations when applied to African economies. First, the framework rests on, among others, the fundamental assumption of harmony between external and internal sectors, that is, once external balance is achieved, internal balance would follow. It is taken as given, that physical and human resources are freely mobile internally, ensuring that factors of production will be easily reallocated to the competitive tradable sector, and other conditions such as the quality of skills, adequate infrastructure and other conditions for achieving full employment are guaranteed. To put it mildly, this assumption is far-fetched in most African countries. Second, the framework is more suitable for economies exporting manufactured goods rather than for exporters of raw materials, owing to the fact that prices of raw materials are determined in international commodity markets and therefore not significantly influenced by either exchange rate or labor costs of the countries of origin. In other words, export demand for a primary product is neither sensitive to producer's exchange rate nor to its domestic cost of production, but rather depends on international market prices. Given that most African countries export mainly raw materials and are price-takers in the markets, this framework is of little relevance.

Third, improvements in non-price factors – which may raise the level of productivity in the economy and thus improve its overall competitiveness – may not lead to increases in the volume of international trade but might instead show up in improvements in the terms of trade. This may be more important for developing countries with large non-traded sectors and may cause the REER to

miss important gains in competitiveness.[5] Incidentally, most African economies are dominated by services sectors that are largely informal and non-traded. Fourth, movements in the REER of small open economies hardly reflect the state of the countries' competitiveness owing to the preponderant influence of external shocks (favorable and unfavorable) arising from international goods and capital markets. To the extent that adjustments in these economies are sluggish, changes in competitiveness indices might well reflect those exogenous factors rather than actual changes in domestic conditions of production and value addition.

The focus on exchange rate has also been criticized as being narrow. Fagerberg (1988, 1996) and Dosi et al. (1990) concluded that a competitive real exchange rate alone does not deliver international competitiveness if backward institutions, deficient technology, inefficient business environment, poor infrastructure and low human capital exist in an economy. Wignaraja (2005) argues further that these factors could be more important for competitiveness of developing countries, especially those in Africa. Thus, adequacy of relative price-cost measures in assessing competitiveness in the presence of substantial structural and capacity constraints is questionable.

2.2 The International Competition Perspective

Given the shortcomings of the macroeconomic approach, economists began to turn to the Schumpeterian notion of competitiveness wherein competition arises from *"the new commodity, the new technology, the new source of supply, the new type of organization"* and *"strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives"* (Schumpeter, 1943, p. 84).

The competition approach focuses on domestic factors that affect the ability of countries to compete in international markets, rather than on price-cost measures, as the core determinants of competitiveness. This approach marks a shift from exchange rate and labor costs as indicators of international competitiveness to world market shares attainable by a country. In describing the approach, Fagerberg (1988) notes that a theory of international competitiveness must establish the links between the growth and balance-of-payments position of an economy and the factors that influence the process. His model of international competitiveness relates growth of market shares to the set of factors that determine ability to compete in technology, ability to compete in price, and ability to compete in delivery. Using data from 15 OECD countries, the results from the model show that factors relating to technology and capacity are very important for long-run differences across countries in growth of GDP and market shares while price factors play a more limited role than is assumed in the macroeconomic perspective.

However, two issues limit the usefulness of this approach in analyzing African economies. First, the measure is developed for analyzing manufactured goods,

[5] This point is emphasized by Durand and Giorno (1987, p. 149)

whereas manufactures constitute negligible fractions of exports of most African countries. Second, conceptual issues relating to measurement of market shares of developing countries, as well as difficulties in obtaining suitable proxies for most of the explanatory variables in the model (in particular, proxies for the relative unit labor cost) render this approach less appealing.

2.3 The Business Strategy Perspective

This approach originates from the business studies literature and was pioneered by Porter (1990) who, in his study of eight developed and two newly industrializing countries, attempted to explain why some countries are more successful in particular industries than others (Moon *et al.* 1998; Smith 2010). In contrast to the macroeconomic approach, this approach considers a nation as an aggregation of industries and applies micro-level business strategy concepts in studying international competitiveness. In effect, the approach implies that continuous upgrade is the key to sustaining a competitive edge and competitive advantage of a country is the result of firm-level innovations and successes in gaining large shares of world markets. Further development in the microeconomic literature on innovation and learning in the development process has given rise to extension of the initial framework to emphasize creation and adoption of technology as the drivers of competitive advantage. The basic underlying model, referred to as the "Diamond Model," classifies economies into four stages that are reminiscent of the Rostow stages of development, namely factor-driven, investment-driven, innovation-driven and wealth driven stages,[6] and casts competitiveness as outcome of interaction among four critical endogenous components of a nation's diamond namely:

a Factor conditions: this component relates to the country's position in factors of production such as skilled labor and infrastructure necessary to compete in a given industry;

b Demand conditions: this component captures the nature of home-market demand for the industry's product or service;

c Related and supporting industries: this component refers to the presence of supplier industries and other related industries that are internationally competitive;

d Firm strategy, structure and rivalry: this component captures the conditions governing how firms are created, organized and managed and the intensity of domestic competition;

and two exogenous parameters namely: e) government and f) chance.

[6] Wignaraja (2005) notes that the diamond model was influential in the development of the Global Competitiveness Indicator (GCI) published regularly by the World Economic Forum, and that Professor Porter served as advisor in the process.

Porter's approach has been criticized by economists and business strategists. Krugman (1994) objects to the idea that countries compete in international markets like corporations. He contends that international trade is not a zero sum game but one in which specialization and trade according to comparative advantages yield welfare gains to all nations. Waverman (1995) also described the model as too general in that it tries to explain every aspect of international trade and competition but eventually describes nothing. However, Grant (1991) contends that the model does better in understanding the patterns of trade and investment in the new world economy than existing theories. On the international business side, most of the criticisms have focused on what is missing in the model. Critics point out that the model ignores the attributes of a country's largest trading partners and is flawed if applied to small trading economies (Rugman 1991, 1992). Others point to omission of the role of multinational corporations (Dunning 1993).

There have also been concerns about how competitiveness should be measured in the diamond model. Gray (1991) suggests that Porter's definition of national competitiveness comes down to the rate of growth of GDP. Reinert (1995) disagrees with Gray and contends that the definition is hardly operational. In his view, competitiveness is divorced from issues of productivity and efficiency, and high productivity levels do not necessarily lead to competitiveness. He contends that "[a]lthough it is difficult to be competitive if you are not efficient and have a high productivity, it is by no means obvious that being the most efficient producer of an internationally traded product makes a country competitive - i.e. enables it to raise the standard of living" (p.26).

While the measurement challenge is far from settled, the framework has been modified to take into account the various criticisms. The model has been extended to account for the role of external diamonds, resulting in the double diamond model (Rugman and D'Cruz 1993; Rugman and Verbeke 1993), the generalized double diamond model (Moon *et al* 1998) as well as multiple diamond models (Bellak & Weiss 1993; Cartwright 1993)[7]. The enriched model now serves as the underlying framework for the most widely referenced measure of competitiveness, the Global Competitiveness Index (GCI) prepared by the World Economic Forum, as well as other competitiveness rankings produced by other institutions.[8] Consistent with the diamond model, the GCI framework defines competitiveness as: "the set of institutions, policies and factors that determine the level of productivity of a country," and analyzes competitiveness based on both "microeconomic and macroeconomic foundations of national com-

[7] An equally legitimate concern would be an attempt to distinguish between price and non-price factors, however, even in its most expansive form the diamonds model has not done that yet, only contending thus far to differentiating between external and internal diamonds.

[8] Other competitiveness ratings include World Competitiveness Yearbook (WCY), Irish National Competitiveness Council (NCC), Doing Business Index (DBI) and Africa Competitiveness Report (ACR). The WCY framework identifies four main aspects of competitiveness: economic performance, government efficiency, business efficiency and infrastructure, and produces a ranking of countries along those lines. The Irish NCC distinguishes between inputs to national competitiveness (over which policy-makers have considerable leverage) and so-called "essential conditions" that must be present.

petitiveness."[9] The African Competitiveness Report (ACR) complements these efforts by underscoring the continent's competitiveness challenges while highlighting "areas requiring policy action and investment to ensure Africa lay the foundation for inclusive and sustained growth."

The business strategy framework differs from the macroeconomic perspective in terms of the role of public policy. While the macroeconomic perspective prescribes a narrow but direct influence of public policy, the business strategy approach suggests a broader but indirect role. In the former, government institutes controls and protections, and intervenes in the currency exchange market. In the latter, public policies can play a role in skill and infrastructure development, industrial clusters reinforcement and promotion of free trade as well as domestic competition.[10]

3 Theoretical Framework

In this section, we explore limited labor mobility and elements of global value chains in the exchange rate framework with a view to providing justification for our approach to measuring competitiveness.

In the imperfectly competitive framework underlying international trade, economies of scale leads to reduced costs and lower trading prices. However, the benefits are not passed entirely onto global consumers as would be the case under perfect competition, but are partially kept back as surpluses in the supplier countries and distributed in the form of higher wages, profits, and, ultimately, government income through taxation. Countries gain competitiveness by reallocating resources into "high-value" industries, leading to rising national living standards while at the same time producing goods that meet the test of international markets. **In effect, a country becomes competitive as it: (a) strategically accumulates value by selling low-priced goods to the rest of the world (more importantly its trading partners), and, (b) does so by reallocating more of its human and physical resources into the value-creating sectors and industries.** Alternatively, the latter requires that labor in non-traded sector be in the position to participate and benefit from productivity growth in the traded sector. The first condition is the relative price or efficiency requirement while the second condition is the equity or inclusivity requirement.

[9] The index is built on twelve pillars grouped into three categories that reflect the key drivers of competitiveness in economies at different stages of development: the factor-driven, efficiency-driven and innovation-driven stages. The GCI is sensitive to these differences by varying the weights assigned to the sub-indexes in the computation of national competitiveness along the stages of development. The World Bank Doing Business Index (DBI) also examines some of the components of the GCI framework. Although the DBI rankings are not in lockstep with the GCI's, a correlation coefficient of 0.83 was established between the rankings in GCI 2012/13 and DBI 2013 (taken from an analysis credited to Scott Rogers).

[10] The idea of indirect government role in competitiveness has been supported by some authors in the business strategy literature. Yip (1992) emphasizes the role of government in promoting free trade and privatizing state-owned enterprises while Ohmae (1994) emphasizes defence against external threats and removal of controls on trade and investment.

The exchange rate framework emphasizes the efficiency condition but assumes away the inclusivity condition. Indeed, while emphasizing efficiency of production, the exchange rate approach assumes perfect linkages between traded and non-traded sectors, homogeneity of labor markets and perfect labor mobility as espoused in the Balassa-Samuelson (BS) model.[11] According to BS, wage increase arising from productivity increase in the traded sector will raise labor demand, leading to wage equalization in both sectors through free movement of labor between sectors and increased labor productivity in the non-traded sector. If technology in non-traded sector does not change, then relative non-traded prices will rise to equalize wages.[12] Empirical evidence cast substantial doubt on the prediction, and shows that wages are higher in exporting sectors than in non-exporting sectors.[13] By ignoring equity considerations in the distribution of surplus, the exchange rate perspective falls short in its assessment of competitiveness. This shortcoming is particularly relevant in economies where segmentation, persistent sectorial technological gaps, insufficient investment in human capital and other impediments to internal mobility of labor constraint reallocation of resources across sectors. The more important these factors are, the more important is the inclusivity concern, and the less reliable is the exchange rate framework for assessing competitiveness.

Production sharing through global supply chains imply that goods traded by a country in the international market are not produced solely by means of domestic factors but could also have trading partners' factors embedded in them. As Bayoumi et al (2013) demonstrate, a country could experience loss of competitiveness in domestic factors but may not lose competitiveness in the pricing of traded goods due to the moderating influence of trading partners' factors. This raises the likelihood of concurrence of competitive pricing of exports and noncompetitive internal conditions, generating disharmony between external position and internal conditions, and further limits the utility of the exchange rate approach to competitiveness.

We illustrate this problem using the BS framework as laid out by Schmillen (2011). Consider a model of two small open economies, two homogeneous goods with one traded and the other non-traded, and one factor of production (labor). In order to highlight the inclusivity considerations, we make two important assumptions. First, the combined effects of globalized supply chains and foreign direct investment and trade (interactions between domestic and foreign diamonds) lead to similar technologies and productivities in the traded sectors of

[11] The Balassa-Samuelson (1964) model predicts that relative productivity increase of 1 percent in the traded sector raises the relative price of non-traded good by 1 percent but leaves the ratio of non-traded wage to traded wage unchanged.

[12] As Iversen and Soskice (2010) demonstrate, this prediction is based on several implicit assumptions including large-scale skill formation and perhaps wage restraint that requires some form of centralized labor unionization.

[13] Schmillen (2011) and Cardi and Restout (2013) provide a good overview of the studies. In general, relative non-traded wages fall and relative non-traded prices rise by more than predicted in BS. In particular, Schmillen (2011) emphasizes the need to amend conventional models of exchange rate determination to account for heterogeneity of labor markets acros sectors.

the two countries Second, Purchasing Power Parity (PPP) holds in the traded sector. Under these conditions, we proceed to decompose the real exchange rate using the standard definition (in logarithm form)

$$q = p^h - p^f - e, \tag{1}$$

where p denotes prices, superscripts h and f represent home and foreign country respectively, and e is the nominal exchange rate defined in terms of units of h's currency per unit of f's. An increase in q reflects an appreciation of the real exchange rate. We define the price index as the geometric average of traded and non-traded prices and assume homogeneous preferences for non-traded and traded goods across countries. Thus, consumption expenditure shares for non-traded and traded goods, given by θ and $1-\theta$ respectively, is same at home and abroad. The price indices are given by

$$p^h = \theta p_n^h + (1-\theta) p_t^h; \tag{2}$$

$$p^f = \theta p_n^f + (1-\theta) p_t^f \tag{3}$$

where subscripts n and t represent non-traded sector and traded sector respectively Substituting (2) into (1) yields

$$q = (p_t^h - p_t^f - e) + \theta(p_n^h - p_n^f) - \theta(p_t^h - p_t^f) \tag{4}$$

Equation (4) implies that the real exchange rate is the sum of three components: (a) the relative price of tradables, (b) the relative price of non-tradable in home country in terms of non-tradables in foreign country, and (c) the corresponding relative price of tradables. Under the assumption that PPP holds in the traded sector, the first component is zero. The assumption of similar technologies and productivity of traded sectors (through global supply chains and shared diamonds) also imply that prices and wages in the traded sectors are equalized[14] in the two countries, making the third component of (3) equal to zero. These substitutions lead to a real exchange rate that depends mainly on the second component,

$$q^1 = \theta(p_n^h - p_n^f). \tag{5}$$

Equation (5) focuses on the internal (non-traded) sector and allows an examination of how value creation affects the exchange rate. In the standard BS framework, sectorial price and productivity are related in the form $p_i^j = w_i^j - a_i^j$, where w is the nominal wage rate, a is labor productivity, and $i = t, n; j = h, f$. Rewriting (4) in terms of wages and productivities yields

[14] We assume that foreign direct investments are motivated by factor-price differentials. Thus, productivity and wages are equalized at the task level in the two countries. Since technology is similar, the tasks are similar and therefore wage indices are similar in both countries. In standard practice, these translate into constant unit labor cost (real wage divided by labor productivity) and relative unit labor cost of 1.

$$q^1 = \theta[(w_n^h - a_n^h) - (w_n^f - a_n^f)] \tag{6}$$

The real exchange rate in (6) reflects essentially the ratio of domestic to foreign non-traded wages adjusted by labor productivities[15] According to BS, wage equalization between traded and non-traded sectors is achieved through either technological change or price increase in non-traded sector This equilibrium outcome rests on assumption of mobility of labor between the sectors. If labor is not freely mobile, for instance if skills required in the traded sector are scarce, then wage equalization may fail to hold, and non-traded wage adjustment will involve elements of price adjustment and nominal wage rent depending on the strength and coordination of wage-setting institutions[16] Because such nominal wage rents will simply reduce profits (transfer more resources out of profits into wages), a higher value of q^1 is thus associated with more equitable distribution of operating surplus in the economy In addition, a country with better technology and more skilled workforce in its non-traded sector will record higher profits, higher rents and consequently, higher adjusted non-traded wages in equation (6)[17] These instances raise the possibility, and induce the oddity that a more competitive economy could have higher real exchange rate, rendering invalid the idea that a higher real exchange rate reflects loss of competitiveness[18]

To incorporate these realities, we define ω_n^j as the (latent) non-traded nominal wage that simply adjusts actual non-traded productivity level a_n^j for price changes induced by rising wages in traded sector. That is, $\omega_n^j - \tilde{p}_n^j = a_n^j$ where $\tilde{p}_n^j$ is pure adjustment for price level Substituting into (6) yields an equation

$$q^1 = \theta[(w_n^h - \omega_n^h) - (w_n^f - \omega_n^f) + (\tilde{p}_n^h - \tilde{p}_n^f)], \tag{7}$$

which has three components: a) difference between the observed non-traded nominal wage and the productivity-indexed counterpart in the home country, b) the corresponding measure in the foreign country, and c) relative price adjustments in home country compared to the foreign country. The first two components translate to transfers from profits to wages, or, *rents* earned by workers in the non-traded sector.[19] Denoting $r^j = w_n^j - \omega_n^j$ leads to

[15] Ordinarily, a high real exchange rate reflects high relative prices, which is thought to reflect high relative production costs. But once production cost of tradables are isolated, then the behavior of real exchange rate is influenced principally by non-traded wages.

[16] Aukurst (1977) suggests that solidaristic labor unions under Norwegian centralized bargaining system is instrumental to keeping traded and non-traded wages in normal relations. Iversen and Soskice (2010) suggest that political institutions can also be instrumental in this process. Countries with centralized unions and proportional representation electoral system tend to have high relative non-traded wages than countries with decentralized unions and majority electoral systems. In particular, they suggest that centralized unions use wage compression to minimize wage gaps between the sectors.

[17] In the global supply chain, operating surpluses or profits increase at successively higher stages of the value chain justifying higher rents in counries with more skilled workforce than elsewhere.

[18] Iversen and Soskice (2010) provides a summary of studies that demonatrate this instance empirically.

[19] These rents are not necessarily positive. Indeed, wage adjustment may lag behind prices

$$q^1 = \theta[(r^h - r^f) + (\tilde{p}_n^h - \tilde{p}_n^f)]. \tag{8}$$

Thus, equation (8) decomposes relative non-traded prices in equation (5) into relative wage rent and relative price components, and shows that the real exchange rate in the externally competitive setting could be driven by either component. Recent efforts to control inflation within the macroeconomic stability framework minimizes the impact of the latter component and implies that internal competitiveness (rising real exchange rate) is driven more by the former. In essence, an economy that is more successful in creating value and distributing surpluses in more inclusive ways may have higher exchange rate.

In general, internal competitiveness is driven by advances in the global supply chain which leads to higher value addition, increased urbanization of the workforce (more importantly in an industrializing economy), stronger linkages between traded and non-traded sectors, large-scale skill production, balanced development in production sectors, and policies that deliberately promote inclusiveness.

3.1 Measuring Competitiveness

Our analysis in the preceding section implies that an appropriate measure of national competitiveness must: i) capture both external (traded) and internal (non-traded) sectors, ii) capture accumulation of value and its distribution, iii) compare countries with their trading partners with which they share diamonds, and iv) rise as a country captures higher-value components of global supply chains relative to trading partners.

The alternative measure of competitiveness analyzed in the context of the diamond model is the Trade-Weighted Value-added per capita (TWV) of a country, relative to its main trading partners, using statistically determined trading weights.

$$TWV_{i,t} = \frac{VAPC_{i,t}}{\sum_{j=1}^{j=5} TW_{j,t}.VAPC_{j,t}} \tag{9}$$

Where $VAPC_{i,t}$ is value added per capita of the country, $VAPC_{j,t}$ is value added per capita of partner j and $\mathrm{TW}_{j,t}$ is the statistically determined trade weight of that partner. In line with standard practice, we use data from the top 5 trading partners, in terms of weight, in the computation. Indeed, by comparing accumulation of value in a country to its trading partners, the measure is broadly consistent with the interpretation of competitiveness under the conditions of the new trade theory.

The principal merit of this approach in view of the structure of output of African countries is as follows. If competitiveness is to capture strategic competitive advantage that countries deliberately pursue through policies rather

in which case actual nominal wage w_{nt}^j will be smaller than the fully adjusted nominal wage $\omega_{nt.}^j$

than comparative advantage in resource endowments, then countries that simply extract raw materials and ship them overseas without advancing in the global value chain will not gain competitiveness under this framework even if they keep nominal exchange rates very low. It is well known that exporters of raw materials capture very trivial portions of product value chains. Banga (2013) shows that only 8% of total value added in global value chains accrue to less-developed and developing countries whose exports are typically dominated by raw materials. Since value addition increases at higher stages in the value chain and is driven by both domestic and foreign diamonds, improvements in the quality of diamonds would drive higher values and rents and thus enable a country to accumulate them faster than the rest of the world. Movements in the ratio of domestic value-added to foreign value-added is a plausible indicator of the extent to which a country is making technological progress and gaining larger shares of global value chains relative to the rest of the world in the double-diamond framework. This is the basis of competitiveness.

Notably, variants of TWV have been used to reflect phenomena that are tangential to the subject of this paper. Abdih and Tsangarides (2006) referred to the measure as "productivity index" and used it as proxy for technological progress in their analysis of equilibrium real effective exchange rate in the franc zone. The denominator, trade weighted real value-added of a country's trading partners (Dos Santos et al 2003) is a well-established determinant of price and demand for a country's exports in the international trade literature (Cronovich and Gazel 1998; Vieira and Haddad 2011).[20]

Wagner and Zeckhauser (2006) used the measure to demonstrate the differential rates of progress among 157 countries around the world over the period 1960-2000. Although they did not refer to it as a measure of competitiveness, the phenomenon described in their paper is essentially that of competitiveness. A graph of trade-weighted relative GDP per-capita against relative GDP per-capita (page 29) shows Singapore, South Korea and Ireland as three countries that achieved substantial progress during the period covered, with Singapore being the most successful in moving from the bottom left quadrant (poor and uncompetitive group) to the top right quadrant (rich and competitive group). Coincidentally, Singapore and South Korea were the two Newly Industrializing Countries (NICs) included in the study by Porter (1990) that led to the development of the diamond competitiveness model. In particular, the pattern that emerged in which Singapore was more successful than South Korea is consistent with the finding by Moon *et al* (1998) in the context of the generalized double diamond model.

In other to demonstrate the utility of the TWV in the empirical section, we compare its performance to existing measures of competitiveness, namely the EXPS (manufacturing export shares) and REER. We compute EXPS by relating a country's share of Africa's export of manufactured goods to its share of Africa's (weighted) output. The REER data is obtained from UNCTAD

[20] In addition, Adolfson et al (2007) demonstrates its usefulness in Central bank forecasting models.

statistics division.

3.2 TWV for African Countries 1981-2010

We present in Figure 1 graphs of TWV for a sample of African countries and the position of their GDP per capita relative to the population-weighted African average for 5-year periods covering 1981-2010. The empirical range of values on the vertical axis is reasonable given that a typical African economy is much smaller than its trading partners, arising from trade ties with former colonial masters. On the horizontal axis, we placed a line at the value of 1 to indicate the position of the average African economy during the respective period. A movement northward (along the vertical axis) reflects an increasing rate of value addition relative to the country's trading partners (driven by gains in global value chains) while an eastward movement (along the horizontal axis) reflects an expansion of the economy relative to the African average. An economy that is simultaneously gaining increasing share of global value chains and expanding faster than the average African economy will progress in the north-east direction.

Economies that basically extract and sell primary commodities in response to world demand will remain roughly in the same spot for the entire period. Because many African countries are doing similar things, each country in this group can only expand at the average African rate. As the figure shows, this is the experience of a majority of the countries that remained in the bottom-left corner of the graph throughout the entire period.

In Figure 1a, the trajectories of Seychelles and Gabon provide instructive lessons. Having started out as the most north-eastern countries during 1981-1985, Seychelles progressed north-east through the future periods while Gabon rather went south-west. In the case of Seychelles, the country went from 88 percent of trading partners' value added per capita during the early 1980s to 111 percent in late 2000s. At the same time the economy expanded in per capita terms from 9 to 12 times the African average. On its part, Gabon started out in the early 1980s with per-capita GDP that was about 8 times the average SSA and 67 percent of value addition of its trading partners. By the late 2000s, these positions have fallen to 4 times and about 36 percent respectively.

A group of countries led by Benin, which includes Djibouti and Swaziland to lesser degrees, exhibited a particularly different type of progress. In the case of Benin, there was a gradual upward movement on the vertical axis beginning in early 1990s although there was no movement on the horizontal axis through the entire period. In essence, the country seems to be doing well at capturing larger components of value chains but only expanded at the rate of the average African economy.

A few countries emerged during the period with impressive north-east trajectories, both gaining on trading partners as well as expanding faster than the average African economy. The most notable success in this sense is Equatorial Guinea, which expanded from half the size of the average African economy and 4 percent of the size of its trading partners in early 1980s to nearly seven times and 72 percent respectively in late 2000s. Libya also emerged as notable suc-

cesses in the late 1980s and early 1990s, receded in late 1990s and early 2000s but resurged in late 2000s.

In figure 1b, South Africa ended roughly in the same position as it started, by declining and regaining thereafter. The country started out as 3.6 times the African average economy in terms of per-capita GDP and 38 percent of trading partners in the early 1980s, and ended as 3.3 times and 39 percent respectively during late 2000s. Indeed, its growth has been driven by the extractive industries since the 1990s. Because its growth driver is similar to many African countries, the rate of expansion of its economy (on per-capita basis) is not faster than the African average. The drop in South Africa's position on the vertical axis could be interpreted as loss of higher rents along value chains as output and trade shifted from intra-industry nature that entailed export of intermediate goods compared to a more inter-industry form that entailed exporting raw materials and importing manufactured goods.[21]

In all, the most successful among African countries, which progressed north-eastward over the period, include Mauritius (the most outstanding), and Botswana and Cape Verde to lesser extent (see Figure 1b). Incidentally, Mauritius and Botswana have both received high rankings in the Global Competitiveness Report (GCR), demonstrating the consistency of our framework with the widely acclaimed competitiveness framework.

3.3 Empirical Analysis

Our task in this section is to use an appropriate econometric model to identify the factors that explain progress in competitiveness. The basic model to be estimated is the panel model given as follows:

$$C_{it} = \alpha + \beta X_{it} + u_i + \varepsilon_{it} \tag{10}$$

where C_{it} measures competitiveness of country i in year t, X_{it} is a vector of time-variant regressors and β is a vector of coefficients. The term u_i represents individual country time-invariant specific effects while ε_{it} is the remainder (non-systemmatic) disturbance term. The measures of competitiveness we examine are REER, EXPS and TWV.

Our explanatory variables reflect components of domestic and international diamonds in Moon et al (1998) generalized double diamond framework. Due to data completeness constraints, we are unable to include as many components of the framework. Our main variables classified under the respective diamonds include:

Factor Conditions:

1. *GDP per capita relative to SSA average.* This is used to capture internal factor conditions including labor and population issues, as well as to

[21] South Africa's exports transited from a fairly diversified structure in the 1990s to a mineral and resource dominated structure in the mid and late 2000s in ways that have been demonstrated to be consistent with China's demand for resources (Onyekwena and Taiwo 2013).

mitigate the undue influence of resource abundance in the analysis.

2. *Years of Schooling.* This is used in capturing the education-related aspect of human capital.

3. *Life Expectancy at Birth.* This is used in capturing the health dimension of human capital such as the efficacy of the health care system, consistent with Acemoglu and Johnson (2007).

Demand Conditions:

1. *Domestic Demand Pressure.* This is the sum of private investment and consumption spending divided by GDP, and measures demand conditions at home.

2. *Urban population ratio.* This is the proportion of the population that reside in urban areas, and captures demand for goods and services.

Related and Supporting Industries:

1. *Telephone lines per 1000 persons.* This captures communication infrastructure

2. *Net Inward Foreign Direct Investment (FDI) to GDP ratio.* This reflects external factor conditions that serve and support domestic industries

Firm Strategy, Structure and Rivalry:

1. *Openness to Trade.* This captures the intensity of trade interaction with the rest of the world and is proxied by the ratio of trade volume (import and export) to GDP.

Governance and Institutions:

1. *Debt service to exports ratio.* Excessively high levels of debt and debt service reflect the quality of governance institutions, and the extent to which they constrain efficient domestic resource (re)allocation.

2. *Polity2.* This is a prominent measure of the quality of governance

We use a panel data of African countries for the period 1981-2010. Our main sources of data include Penn World Tables Version 7 and World Development Indicators (WDI). Other sources include UNCTAD Stat and Barro-Lee schooling datasets.

3.4 Econometric Issues

There are potential endogeneity concerns associated with the analysis. One, there is potential that unobserved country effects will be correlated with included explanatory variables. We treat this problem by estimating fixed and random effects models, and conducting a Hausman test in order to select the appropriate model. Second, there is the potential for reverse causality between the dependent variable and some independent variables. For example, a rise in competitiveness can attract foreign direct investments (FDI) and lead to greater openness, implying that FDI and openness could be outcomes of increased competitiveness. To treat this problem, we adopt the standard approach by using 3-year averages of the dependent variable and initial values (at the beginning of each averaging period) of all explanatory variables.

3.5 Descriptive Statistics:

Table 1 summarizes the data used in the analysis and provides comparisons between groups of countries according to location and production structure.

In Panel A, we include all countries in the sample and compared statistics between oil and non-oil countries, and between economies of the franc zone and other African economies.

Oil Exporting vs. Non-Oil Countries

The two groups are not different in terms of TWV and REER. The observation that non-oil countries have higher EXPS is reasonable given the operation of oil curse where dependence on the oil sector crowds out investment in other productive sectors of the economy including manufacturing. While differences in human capital are not statistically significantly different, oil-exporting countries are more urbanized, more poorly governed, and have larger shadow economies compared to non-oil countries.

CFA Franc Zone vs. Other African Countries

Economies of the fixed-exchange rate CFA franc zone are less competitive in terms of REER and perform worse than other African countries in terms of manufacturing export shares. They are characterized by lower human capital (life expectancy and schooling), poorer infrastructure (proxied by phone lines), and also have larger shadow economies. On the bright side, they have lower debt burden and are more export-oriented than the rest of African countries. When competitiveness is measured by the TWV, there is no evidence that the franc zone is less competitive in terms of value addition.

However, this comparison is problematic for several reasons. The comparative group of countries we included are more advanced economies such as South Africa, Botswana and Mauritius. Thus, the comparison would seem like comparing the franc zone with economies that are on average more advanced. To avoid this trap, we compare the franc zone with carefully selected counterparts.

CFA Franc Zone vs. Selected Comparator Economies

We begin by noting the heterogeneity that exists within the franc zone itself in terms of economic structure. The CEMAC (Communauté Economique et

Monétaire d'Afrique Centrale), which includes Cameroon, Gabon, the Central African Republic, the Republic of Congo, Equatorial, Guinea and Chad, are dominantly oil exporters. On the other hand, the WAEMU (West African Economic and Monetary Union), which includes Benin, Burkina Faso, Côte d'Ivoire, Senegal, Togo, Mali, Niger and Guinea-Bissau, export mainly agricultural products.

To facilitate the comparison, we identify flexible-exchange rate oil-exporting African economies which include the Democratic Republic of Congo (DRC), Nigeria, Angola, Sierra Leone, Uganda and Mozambique as comparators to CEMAC. Similarly, we select agriculture-based flexible exchange regime African countries namely, Ghana (during the time-frame of our study), Guinea, Malawi, Zimbabwe, Ethiopia, Kenya, Tanzania and Gambia as comparable to WAEMU.

We compare the 14 economies of the franc zone to the 14 comparator economies in Panel B. From the table, the competitiveness indices yield conflicting conclusions. The franc zone is on average less competitive on the basis of REER, but more competitive than the comparator economies when measured by the TWV. The absence of significant difference in EXPS, infrastructure and FDI between the franc zone and comparator countries suggests that our selection of comparators has some merit. In terms of human capital, life expectancy is higher in the franc zone but no difference in schooling is observed. In terms of domestic demand, the franc zone invests more domestically while the comparators consume more. The franc zone is also more urbanized, more open to world trade, and has lower debt burden than the comparators. These differences could suggest that the TWV is a better measure of competitiveness than the REER.

CEMAC vs. WAEMU

Looking within the fixed-exchange franc zone in Panel B, the statistics suggest that CEMAC is more competitive on the basis of TWV while WAEMU is more competitive on the basis of EXPS. An examination of the determining factors show that on average, CEMAC has higher stock of human capital, is more urbanized, receives substantially more FDI, and is more open to world trade than WAEMU. It is only in the area of governance that WAEMU appears to perform better than CEMAC. Judging from these differences, it is plausible to infer that CEMAC is more competitive than WAEMU, a conclusion that is consistent with the TWV rather than the EXPS.

Overall, it seems plausible from Table 1 that the TWV performs better than the REER and EXPS as a measure of competitiveness. We proceed to estimating the empirical model.

3.6 Econometric Estimates:

To determine whether a fixed effects or random effects model is appropriate for our analysis, we conducted the Hausman test on the full model. The results yielded a chi-squared statistic of 28.55 with p-value of 0.0015, thus rejecting the null hypothesis that the random effects model is suitable. Therefore, our estimates are based on the within fixed effects model. We also estimated Generalized Method of Moments (GMM) models but the results are not different from

those generated by Ordinary Least Squares (OLS). We also estimated models where human capital is proxied by schooling and others where we use life expectancy. Overall, estimates of the models with life expectancies yielded more robust insights. We report those estimates here.

Table 2 summarizes the results for the basic model based on the complete sample of countries and using TWV as a measure of competitiveness. In the estimates from the full sample presented in column IV, with the exception of net inward foreign direct investment which had the unexpected sign, all the coefficients have the expected signs: economic growth (in relation to the African average), human capital, domestic investment demand, urbanization, and openness increase competitiveness. The results in column V, which is based on a reduced sample due to missing data on the governance variable, sustain the results in column IV and the R-squared dropped from 36 percent to 34 percent.

We repeat the estimation using EXPS as a measure of competitiveness and report the results in Table 3. The results in column V shows openness to trade, and urbanization as promoters of competitiveness with the correct signs. Other variables – human capital and domestic demand – which had the right signs in Table 2 have the wrong signs in Table 3. We performed the same exercise using the REER as measure of competitiveness and report the estimates in Table 4. The results suggest that economic growth yields uncompetitive exchange rates, and more urbanized economies are less competitive. The positive coefficient of domestic consumption may be in the right direction, suggesting that economies with large consumption share of output, which typically involves importing manufactured goods are likely to have uncompetitive exchange rates.

A comparison of the results in Tables 2, 3 and 4 show that movements in REER are connected with the components of the business strategy framework in a very limited way. The R-squared of 11%, compared with 43% and 45% for EXPS and TWV respectively, suggests that internal drivers of competitiveness have little to do with the REER. Going forward, we leave out the REER from further estimates and proceed to compare the TWV with EXPS. In the case of EXPS, the negative sign of economic size in Table 3 may be understandable given that the denominator of the measure, by construction as share of Africa's output, is positively correlated with economic size, so that economic size would reasonably have a negative sign. However, conditional on economic size, the negative signs of human capital and domestic investment variables in the model cannot be explained along similar lines of reasoning.

In Table 5, we introduce interaction terms into the model in order to see how the influence of the regressors differ between oil countries and non-oil countries. Measuring competitiveness by TWV, the interaction terms (column II) suggest that oil countries that are more urbanized and have more domestic investments are less competitive relative to non-oil countries with similar characteristics, while oil countries that attract more FDI are more competitive than non-oil countries doing the same. Using EXPS, the interaction terms suggest that oil countries with larger economic size and higher domestic demand (private consumption and investment) are more competitive while those with greater openness to trade are less competitive relative to the non-oil counterparts.

We proceed to estimate the model for only franc zone economies examining the differences between CEMAC and WAEMU in the contribution of the independent variables to competitiveness. The results in column II of Table 6 shows that in addition to economic size, only human capital and consumption explains competitiveness within the franc zone. However, the zero coefficients of the other variables could be the outcome of aggregation of non-identical data generation processes that yielded counteracting effects. To examine this possibility we interacted a dummy for CEMAC with the explanatory variables. The results summarized in column II suggest that the contributions of human capital and urbanization to competitiveness are smaller in CEMAC than in WAEMU, while also turning up the result that the negative effects of debt burden on competitiveness is smaller in CEMAC. The model explaining EXPS, although showed an R-squared of 56%, performs very poorly in comparison. Variations in manufacturing export shares were not predictable based on the included factors other than openness.

The same model was estimated based on data from African countries outside of the franc zone. The results presented in Table 7 column I differ from those obtained in Table 6 in many respects. First, domestic investment and openness are additional drivers of competitiveness. Second, FDI and the governance index both turned out with unexpected negative signs. The results in column II that seeks to distinguish between oil and non-oil countries in this sub-sample shed more light on these coefficients. The results show that relative to non-oil countries, oil producing countries are more competitive through investments infrastructure. On the other hand, the contribution of domestic investment to competitiveness diminishes in oil-producing countries relative to the non-oil countries. Again, the model analyzing EXPS shows only urbanization and openness to promote competitiveness while human capital, domestic demand and FDI all have the wrong signs.

Next, we estimate the model for the sample of oil-producing African countries, both in and out of the franc zone. The estimates summarized in Table 8 show that infrastructure is essential to promoting competitiveness in the sample. A comparison of the oil countries in CEMAC with oil countries outside of the franc zone suggests that human capital and infrastructure plays less-important role in CEMAC compared to oil countries outside of franc zone, and the impact of debt burden also diminishes in CEMAC compared to others. The EXPS model identifies only domestic demand as driver of export shares, and that both domestic demand and openness to trade are more beneficial in CEMAC than the remaining oil producing countries of Africa.

Lastly, we estimated the models for the sample of non-oil countries, both in and out of the franc zone. The results in column I of Table 9 show that in addition to economic size, domestic demand, urbanization and openness importantly promote competitiveness in the sample of countries. In column II, the contribution of urbanization is shown to be higher in the franc zone (in WAEMU) relative to non-franc zone countries. The EXPS model continues to emphasize, openness and urbanization as drivers of competitiveness in export shares.

3.7 Discussions and Concluding Remarks

The analysis in the preceding section shows the extent of heterogeneity in the drivers and constraints to competitiveness in the sample of African countries over the period covered by the data. The econometric results throw up a string of interesting findings.

Human capital, proxied in the analysis by life expectancy at birth, emerges as a key driver of competitiveness across African countries. Because human capital is a composite factor that incorporates education, training, vocational skills and health, African countries would do well by investing in the productivity of their population and labor force.

Once the human capital issue is settled, there is substantial heterogeneity in the set of factors that act as promoters and constraints to competitiveness across regions and across production structure. In general, the non-oil countries (WAEMU and WAEMU-C) would gain in competitiveness through increased urbanization and greater openness. For instance, from the data used in this analysis, the WAEMU group of countries is least urbanized and least open to world trade. In addition, the group of countries in WAEMU-C would in particular benefit from increased rates of domestic investment and spending.

In general, infrastructure development and FDI inflows are promoters of competitiveness while domestic demand pressures are a constraint to competitiveness in the oil-producing African countries. Beyond these general factors, oil-producing countries outside of the franc zone with high degrees of openness and urbanization are less competitive.

Indeed the analysis underscores the role of non-price factors, particularly human capital quality, in the competitiveness of African states. We have also shown that in terms of the drivers of competitiveness, there is no one size fits all recommendation for African countries. Further, and contrary to widely held views, the franc zone economies are not less competitive in comparison to their sub-Saharan African peers and the fixed exchange peg is not necessarily the main source of uncompetitiveness of franc zone economies. This result concurs with the evidence by Fagerberg (1988, 1996) and Dosi et al (1990) which suggest that a competitive real exchange rate is a necessary but not sufficient condition to achieve international competitiveness if an economy is characterized by poor infrastructure, backward institutions, deficient technology, inefficient business environment, and low human capital. However, to improve competitiveness, African states need to invest heavily in human capital, and maintain a stable macroeconomic framework, while actively pursuing a number of country-specific policies.

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TABLE 1

DESCRIPTIVE STATISTICS

PANEL A: ALL COUNTRIES

VARIABLE	NON-OIL COUNTRIES	OIL COUNTRIES	DIFF	t-stat	OTHER AFRICAN	FRANC ZONE	DIFF	t-stat
	(A)	(B)	(B) - (A)		(C)	(D)	(D) - (C)	
Trade-Weighted Value-added (TWV)	0.14	0.16	0.03	1.42	0.15	0.12	(0.03)	1.44
Real Effective Exchange Rate (REER)	101.71	104.68	2.97	0.70	96.78	115.07	18.29	**4.68**
Mfg Export Performance (EXPS)	1.60	0.25	(1.34)	**3.95**	1.40	0.60	(0.80)	**2.22**
GDP per capita / Africa Average	1.27	1.78	0.50	**2.42**	1.53	1.16	(0.37)	**1.72**
Life expectancy from birth	53.71	52.41	(1.31)	1.62	54.44	50.28	(4.16)	**5.07**
Years of Schooling	4.29	3.99	(0.30)	1.40	4.43	3.54	(0.89)	**4.01**
Domestic demand	100.10	80.32	(19.79)	**9.07**	96.93	86.10	(10.83)	**4.53**
Private Consumption	78.69	63.17	(15.53)	**7.16**	75.94	68.42	(7.52)	**3.22**
Investment	21.41	17.15	(4.26)	**3.60**	21.00	17.69	(3.31)	**2.68**
Urbanization	33.40	40.49	7.09	**4.54**	35.52	35.75	0.22	0.14
Phone Lines per thousand	2.52	1.66	(0.87)	**2.13**	2.84	0.68	(2.15)	**5.20**
Net Inward FDI to GDP	2.73	4.07	1.34	1.29	3.10	3.29	0.19	0.18
Openness	66.21	62.67	(3.53)	1.00	66.27	62.04	(4.23)	1.15
Debt Service to Exports	14.68	15.44	0.76	0.55	15.97	12.35	(3.62)	**2.72**
Polity 2	(0.99)	(3.71)	(2.72)	**4.95**	(1.59)	(2.56)	(0.96)	1.65
Shadow economy	40.38	43.01	2.63	**2.00**	40.42	43.14	2.72	**2.01**

PANEL B: FRANC ZONE AND SELECTED COMPARATORS

VARIABLE	OTHER AFRICAN	FRANC ZONE	DIFF	t-stat	**FRANC ZONE** WAEMU	CEMAC	DIFF	t-stat
	(E)	(F)	(F) - (E)		(G)	(H)	(H) - (G)	
Trade-Weighted Value-added (TWV)	0.05	0.12	0.07	**5.63**	0.09	0.17	0.08	**3.21**
Real Effective Exchange Rate (REER)	91.40	115.07	23.67	**4.96**	114.13	116.02	1.88	0.47
Mfg Export Performance (EXPS)	0.58	0.60	0.02	0.13	0.76	0.38	(0.39)	**2.79**
GDP per capita / Africa Average	0.50	1.16	0.65	**4.45**	0.52	2.00	1.47	**5.57**
Life expectancy from birth	49.00	50.28	1.29	**2.01**	49.21	51.71	2.50	**3.04**
Years of Schooling	3.78	3.54	(0.24)	0.94	2.73	4.77	2.04	**6.88**
Domestic demand	94.46	86.10	(8.35)	**3.48**	98.89	69.06	(29.83)	**10.30**
Private Consumption	78.88	68.42	(10.46)	**4.16**	81.66	50.76	(30.89)	**10.75**
Investment	15.58	17.69	2.11	**1.79**	17.23	18.29	1.06	0.62
Urbanization	27.66	35.75	8.09	**4.90**	29.50	44.08	14.57	**6.18**
Phone Lines per thousand	0.59	0.68	0.09	1.13	0.62	0.77	0.15	1.24
Net Inward FDI to GDP	2.36	3.29	0.93	0.73	1.06	6.33	5.26	**2.30**
Openness	53.33	62.04	8.71	**2.71**	56.58	69.33	12.74	**2.71**
Debt Service to Exports	18.16	12.35	(5.81)	**4.08**	12.28	12.48	0.20	0.12
Polity 2	(2.09)	(2.56)	(0.47)	0.75	(1.31)	(4.22)	(2.90)	**3.40**
Shadow economy	45.51	43.14	(2.37)	1.57	42.55	43.94	1.39	0.75

TABLE 2

COMPETITIVENESS IN THE DOUBLE DIAMOND FRAMEWORK

FIXED EFFECTS REGRESSIONS OF TWV

SAMPLE OF AFRICAN COUNTRIES

	I	II	III	IV	V
GDP per capita/Africa Average	0.09106***	0.09403***	0.08938***	0.09038***	0.08644***
	[0.00461]	[0.00428]	[0.00450]	[0.01105]	[0.01104]
Life expectancy at Birth	0.00163**	0.00146**	0.00180***	0.00198**	0.00195**
	[0.00071]	[0.00063]	[0.00063]	[0.00079]	[0.00077]
Private Consumption/GDP	0.00026	0.00036*	0.00003	0.00013	0.00014
	[0.00023]	[0.00020]	[0.00023]	[0.00025]	[0.00025]
Investment/GDP	0.00118***	0.00124***	0.00089***	0.00107***	0.00118***
	[0.00029]	[0.00027]	[0.00029]	[0.00034]	[0.00034]
Urbanization	0.00137***	0.00182***	0.00134***	0.00150**	0.00142**
	[0.00052]	[0.00049]	[0.00051]	[0.00067]	[0.00068]
Telephone Lines/1000		-0.00027	-0.00061	-0.00174	-0.0009
		[0.00089]	[0.00089]	[0.00112]	[0.00115]
Net Inward FDI/ GDP		-0.00034	-0.00040*	-0.00075	-0.00082*
		[0.00021]	[0.00021]	[0.00048]	[0.00047]
Openness (%)			0.00040***	0.00042***	0.00035**
			[0.00013]	[0.00015]	[0.00017]
Debt Service /Exports				0.00007	0.00005
				[0.00022]	[0.00023]
Polity 2					-0.00008
					[0.00053]
Constant	-0.15924***	-0.17834***	-0.16715***	-0.19066***	-0.18003***
	[0.03873]	[0.03667]	[0.03647]	[0.04465]	[0.04483]
Observations	482	443	443	371	367
Number of countries	51	51	51	46	45
R-squared	0.54	0.62	0.63	0.36	0.34

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 3

INTERNATIONAL COMPETITIVENESS FRAMEWORK

FIXED EFFECTS REGRESSIONS OF MANUFACTURING EXPORT SHARES

SAMPLE OF AFRICAN COUNTRIES

	I	II	III	IV	V
GDP per capita/Africa Average	-0.28194	-1.74181***	-1.84582***	-0.69317***	-0.43997*
	[0.32842]	[0.29048]	[0.29284]	[0.23240]	[0.24279]
Life expectancy at Birth	-0.16590***	-0.12205***	-0.11805**	-0.04700**	-0.05065**
	[0.05763]	[0.04589]	[0.04557]	[0.02203]	[0.02163]
Private Consumption/GDP	-0.05549***	-0.02424**	-0.03494***	-0.01346**	-0.01757***
	[0.01283]	[0.01084]	[0.01201]	[0.00613]	[0.00613]
Investment/GDP	-0.00895	0.05342***	0.04392***	-0.01795**	-0.02028***
	[0.01721]	[0.01497]	[0.01559]	[0.00778]	[0.00765]
Urbanization	0.05488	0.01446	-0.00254	0.03981	0.04079*
	[0.05936]	[0.04785]	[0.04823]	[0.02489]	[0.02443]
Telephone Lines/1000		0.03907	0.02908	-0.03636	-0.04773
		[0.07128]	[0.07089]	[0.03057]	[0.03006]
Net Inward FDI/ GDP		-0.10359***	-0.10451***	-0.01185	-0.01157
		[0.00992]	[0.00985]	[0.00923]	[0.00907]
Openness (%)			0.01309**	0.01795***	0.02308***
			[0.00655]	[0.00304]	[0.00346]
Debt Service /Exports				-0.00035	0.00285
				[0.00601]	[0.00596]
Polity 2					0.01600
					[0.01868]
Constant	12.74499***	10.86992***	11.54211***	3.29574**	3.10260**
	[2.96563]	[2.39296]	[2.39772]	[1.27778]	[1.26873]
Observations	253	244	244	198	195
Number of countries	51	50	50	44	43
R-squared	0.14	0.47	0.48	0.32	0.36

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 4
MACROECONOMIC COMPETITIVENESS FRAMEWORK
FIXED EFFECTS REGRESSIONS OF (LOG) REER
(UNCTAD METHOD - INCREASE MEANS APPRECIATION)
SAMPLE OF AFRICAN COUNTRIES

	I	II	III	IV	V
GDP per capita/Africa Average	0.08315	0.08788*	0.08834*	0.06552	0.06719
	[0.05610]	[0.05293]	[0.05321]	[0.12962]	[0.13043]
Life expectancy at Birth	-0.00016	-0.00587	-0.00595	-0.01141	-0.01156
	[0.01104]	[0.01076]	[0.01082]	[0.01108]	[0.01115]
Private Consumption/GDP	0.00548**	0.00782***	0.00793***	0.00736**	0.00724**
	[0.00253]	[0.00253]	[0.00259]	[0.00283]	[0.00287]
Investment/GDP	-0.00427*	-0.00003	0.00023	0.00079	0.00076
	[0.00223]	[0.00284]	[0.00306]	[0.00327]	[0.00328]
Urbanization	0.01111	0.02102**	0.02153**	0.01949*	0.02051*
	[0.01066]	[0.01039]	[0.01067]	[0.01169]	[0.01228]
Telephone Lines/1000		-0.00689	-0.00647	-0.00472	-0.00463
		[0.01692]	[0.01709]	[0.01609]	[0.01617]
Net Inward FDI/ GDP		-0.00511	-0.00514	-0.00305	-0.00307
		[0.00331]	[0.00332]	[0.00359]	[0.00361]
Openness (%)			-0.00033	-0.00093	-0.00088
			[0.00142]	[0.00140]	[0.00141]
Debt Service /Exports				-0.0012	-0.00125
				[0.00236]	[0.00238]
Polity 2					-0.00253
					[0.00882]
Constant	3.77440***	3.49948***	3.49234***	3.95977***	3.94059***
	[0.56788]	[0.54517]	[0.54857]	[0.64340]	[0.65026]
Observations	151	148	148	132	132
Number of countries	39	39	39	36	36
R-squared	0.1	0.14	0.14	0.11	0.11

Standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 5

FIXED EFFECTS REGRESSIONS OF COMPETITIVENESS MEASURES

SAMPLE OF AFRICAN COUNTRIES

	TWV		EXPS	
	I	II	III	IV
GDP per capita/Africa Average	0.08644***	0.08620***	-0.43997*	-2.50792***
	[0.01104]	[0.02192]	[0.24279]	[0.63072]
Life expectancy at Birth	0.00195**	0.00102	-0.05065**	-0.03257
	[0.00077]	[0.00087]	[0.02163]	[0.02222]
Private Consumption/GDP	0.00014	0.0001	-0.01757***	-0.03202***
	[0.00025]	[0.00031]	[0.00613]	[0.00852]
Investment/GDP	0.00118***	0.00184***	-0.02028***	-0.03194***
	[0.00034]	[0.00045]	[0.00765]	[0.01023]
Urbanization	0.00142**	0.00344***	0.04079*	0.04347
	[0.00068]	[0.00084]	[0.02443]	[0.02741]
Telephone Lines/1000	-0.0009	-0.00225	-0.04773	-0.02717
	[0.00115]	[0.00170]	[0.03006]	[0.03410]
Net Inward FDI/ GDP	-0.00082*	-0.00206***	-0.01157	-0.00298
	[0.00047]	[0.00071]	[0.00907]	[0.01528]
Openness (%)	0.00035**	0.00057***	0.02308***	0.02528***
	[0.00017]	[0.00019]	[0.00346]	[0.00404]
Debt Service /Exports	0.00005	0.00043	0.00285	0.01011
	[0.00023]	[0.00030]	[0.00596]	[0.00654]
Polity 2	-0.00008	0.00017	0.016	0.01553
	[0.00053]	[0.00061]	[0.01868]	[0.01964]
OIL x GDP per capita/Africa Av		-0.00435		2.34373***
		[0.02584]		[0.68842]
OIL x Life expectancy at Birth		0.00096		0.04865
		[0.00212]		[0.06221]
OIL x Private Consumption/GDP		0.00063		0.04290***
		[0.00065]		[0.01508]
OIL x Investment/GDP		-0.00128*		0.04130**
		[0.00069]		[0.01612]
OIL x Urbanization		-0.00451***		-0.04075
		[0.00144]		[0.05546]
OIL x Telephone Lines/1000		0.00789**		0.04896
		[0.00333]		[0.06821]
OIL x Net Inward FDI/ GDP		0.00244***		-0.0003
		[0.00094]		[0.01934]
OIL x Openness (%)		-0.00042		-0.02098**
		[0.00039]		[0.00971]
OIL x Debt Service /Exports		-0.00067		-0.01124
		[0.00044]		[0.01270]
OIL x Polity 2		-0.00007		-0.02289
		[0.00127]		[0.04747]
Constant	-0.18003***	-0.18567***	3.10260**	3.46505**
	[0.04483]	[0.05024]	[1.26873]	[1.35427]
Observations	367	367	195	195
Number of countries	45	45	43	43
R-squared	0.34	0.41	0.36	0.51

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 6

FIXED EFFECTS REGRESSIONS OF COMPETITIVENESS MEASURES

SAMPLE OF FRANC ZONE COUNtRIES

	TWV		EXPS	
	I	II	III	IV
GDP per capita/Africa Average	0.09594***	0.20132*	-0.28282	-0.3886
	[0.01921]	[0.10822]	[0.18880]	[2.04611]
Life expectancy at Birth	0.00460**	0.00302	-0.02936	-0.07642
	[0.00206]	[0.00289]	[0.03819]	[0.07519]
Private Consumption/GDP	0.00124*	0.00161	0.01896**	-0.00987
	[0.00068]	[0.00097]	[0.00935]	[0.02708]
Investment/GDP	0.00122	0.00204	0.01841	0.01949
	[0.00075]	[0.00135]	[0.01137]	[0.02183]
Urbanization	0.00276	0.00826***	-0.01545	-0.0211
	[0.00192]	[0.00255]	[0.03287]	[0.05929]
Telephone Lines/1000	-0.01413	0.00237	0.29763**	0.24687
	[0.01344]	[0.01562]	[0.14073]	[0.23687]
Net Inward FDI/ GDP	0.00026	-0.00300	-0.0086	-0.01952
	[0.00094]	[0.00385]	[0.00853]	[0.04289]
Openness (%)	0.00014	0.00036	0.01315**	0.02615*
	[0.00050]	[0.00053]	[0.00637]	[0.01277]
Debt Service /Exports	0.00004	0.00081	-0.00478	-0.00231
	[0.00057]	[0.00074]	[0.00774]	[0.01297]
Polity 2	0.00168	0.00067	0.0014	0.03883
	[0.00121]	[0.00154]	[0.01804]	[0.03368]
CEMAC x GDP per capita/Africa Av		-0.13501		0.1421
		[0.11075]		[2.08765]
CEMAC x Life expectancy at Birth		-0.01253**		0.03464
		[0.00572]		[0.18213]
CEMAC x Private Consumption/GDP		-0.00065		0.05614
		[0.00155]		[0.04131]
CEMAC x Investment/GDP		-0.00187		-0.03077
		[0.00172]		[0.04729]
CEMAC x Urbanization		-0.00839**		0.01135
		[0.00401]		[0.12449]
CEMAC x Telephone Lines/1000		-0.05017		-0.61785
		[0.03572]		[0.53342]
CEMAC x Net Inward FDI/ GDP		0.00302		0.02105
		[0.00396]		[0.04793]
CEMAC x Openness (%)		-0.00055		0.01394
		[0.00125]		[0.03682]
CEMAC x Debt Service /Exports		-0.00216*		-0.01483
		[0.00122]		[0.02073]
CEMAC x Polity 2		-0.00267		-0.00383
		[0.00273]		[0.07441]
Constant	-0.42532***	-0.18151	0.27332	2.40141
	[0.13284]	[0.17282]	[1.88212]	[5.25046]
Observations	124	124	60	60
Number of countries	13	13	13	13
R-squared	0.38	0.56	0.46	0.56

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 7

FIXED EFFECTS REGRESSIONS OF COMPETITIVENESS MEASURES

SAMPLE OF NON-FRANC ZONE COUNtRIES

	TWV		EXPS	
	I	II	III	IV
GDP per capita/Africa Average	0.08281***	0.07912***	-1.75696***	-2.84819***
	[0.01457]	[0.01932]	[0.56751]	[0.78701]
Life expectancy at Birth	0.00159**	0.00043	-0.04285*	-0.0343
	[0.00074]	[0.00078]	[0.02507]	[0.02608]
Private Consumption/GDP	-0.00002	0.00012	-0.01818**	-0.03583***
	[0.00024]	[0.00027]	[0.00732]	[0.01057]
Investment/GDP	0.00152***	0.00223***	-0.02058**	-0.04368***
	[0.00035]	[0.00043]	[0.00925]	[0.01289]
Urbanization	0.00084	0.00164**	0.07382**	0.09378**
	[0.00066]	[0.00078]	[0.03401]	[0.03701]
Telephone Lines/1000	-0.00005	-0.00099	-0.03499	-0.03763
	[0.00116]	[0.00148]	[0.03335]	[0.03924]
Net Inward FDI/ GDP	-0.00148***	-0.00214***	-0.02261*	0.01186
	[0.00051]	[0.00062]	[0.01271]	[0.01915]
Openness (%)	0.00052***	0.00062***	0.02265***	0.02464***
	[0.00016]	[0.00018]	[0.00423]	[0.00481]
Debt Service /Exports	0.00000	0.00008	0.00184	0.00775
	[0.00022]	[0.00029]	[0.00719]	[0.00808]
Polity 2	-0.00146***	-0.00152**	-0.00106	-0.0118
	[0.00055]	[0.00062]	[0.02717]	[0.02828]
OIL x GDP per capita/Africa Av		0.03327		2.80591*
		[0.03180]		[1.50901]
OIL x Life expectancy at Birth		0.00143		0.04203
		[0.00252]		[0.11812]
OIL x Private Consumption/GDP		0.00013		0.03773
		[0.00071]		[0.02639]
OIL x Investment/GDP		-0.00187**		0.04307
		[0.00077]		[0.02930]
OIL x Urbanization		-0.00208		-0.10409
		[0.00153]		[0.11736]
OIL x Telephone Lines/1000		0.00640**		0.06043
		[0.00307]		[0.08281]
OIL x Net Inward FDI/ GDP		0.00152		-0.01162
		[0.00107]		[0.03104]
OIL x Openness (%)		-0.00017		-0.02294
		[0.00039]		[0.01394]
OIL x Debt Service /Exports		-0.00001		-0.01098
		[0.00042]		[0.02050]
OIL x Polity 2		0.0016		0.03132
		[0.00140]		[0.12921]
Constant	-0.14512***	-0.13818***	3.39115**	4.10479*
	[0.04360]	[0.04792]	[1.49963]	[2.29253]
Observations	243	243	135	135
Number of countries	32	32	30	30
R-squared	0.45	0.53	0.46	0.56

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 8

FIXED EFFECTS REGRESSIONS OF COMPETITIVENESS MEASURES

SAMPLE OF OIL COUNtRIES

	TWV		EXPS	
	I	II	III	IV
GDP per capita/Africa Average	0.08185***	0.11239***	-0.16419*	-0.04227
	[0.00995]	[0.01652]	[0.09152]	[0.36514]
Life expectancy at Birth	0.00198	0.00186	0.01608	0.00773
	[0.00141]	[0.00157]	[0.01928]	[0.03267]
Private Consumption/GDP	0.00074*	0.00025	0.01088**	0.00191
	[0.00042]	[0.00043]	[0.00413]	[0.00686]
Investment/GDP	0.00056	0.00035	0.00936**	-0.00061
	[0.00039]	[0.00042]	[0.00413]	[0.00746]
Urbanization	-0.00107	-0.00044	0.00272	-0.01031
	[0.00085]	[0.00086]	[0.01600]	[0.03158]
Telephone Lines/1000	0.00564***	0.00541***	0.02178	0.0228
	[0.00208]	[0.00176]	[0.01960]	[0.02068]
Net Inward FDI/ GDP	0.00038	-0.00063	-0.00327	0.00024
	[0.00045]	[0.00057]	[0.00393]	[0.00693]
Openness (%)	0.00015	0.00044*	0.0043	0.0017
	[0.00025]	[0.00023]	[0.00293]	[0.00371]
Debt Service /Exports	-0.00024	0.00008	-0.00113	-0.00323
	[0.00024]	[0.00020]	[0.00361]	[0.00534]
Polity 2	0.0001	0.00007	-0.00736	0.01952
	[0.00081]	[0.00082]	[0.01433]	[0.03576]
CEMAC x GDP per capita/Africa Av		-0.04608**		-0.20422
		[0.02026]		[0.42341]
CEMAC x Life expectancy at Birth		-0.01138***		-0.04951
		[0.00292]		[0.09182]
CEMAC x Private Consumption/GDP		0.0007		0.04437**
		[0.00074]		[0.01754]
CEMAC x Investment/GDP		-0.00018		-0.01067
		[0.00068]		[0.02294]
CEMAC x Urbanization		0.00031		0.00056
		[0.00177]		[0.06484]
CEMAC x Telephone Lines/1000		-0.05322***		-0.39378
		[0.01612]		[0.24809]
CEMAC x Net Inward FDI/ GDP		0.00064		0.00129
		[0.00073]		[0.01306]
CEMAC x Openness (%)		-0.00064		0.03839**
		[0.00061]		[0.01824]
CEMAC x Debt Service /Exports		-0.00143***		-0.01392
		[0.00052]		[0.00992]
CEMAC x Polity 2		-0.00207		0.01547
		[0.00139]		[0.04956]
Constant	-0.1212	0.14876*	-1.72487*	-0.44428
	[0.07581]	[0.08454]	[0.97116]	[2.70259]
Observations	107	107	55	55
Number of countries	13	13	13	13
R-squared	0.71	0.86	0.42	0.63

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 9

FIXED EFFECTS REGRESSIONS OF COMPETITIVENESS MEASURES

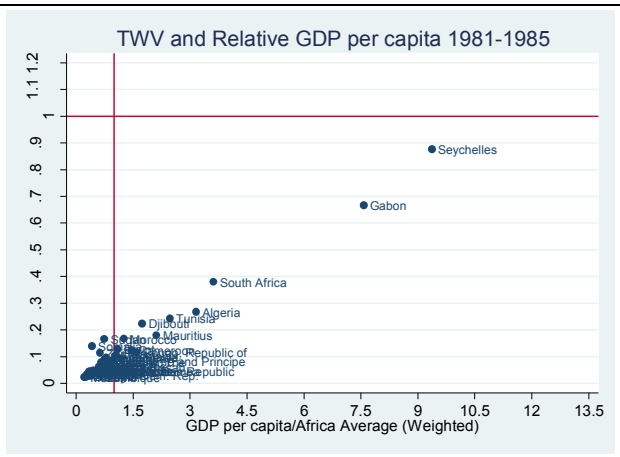
SAMPLE OF NON-OIL COUNtRIES

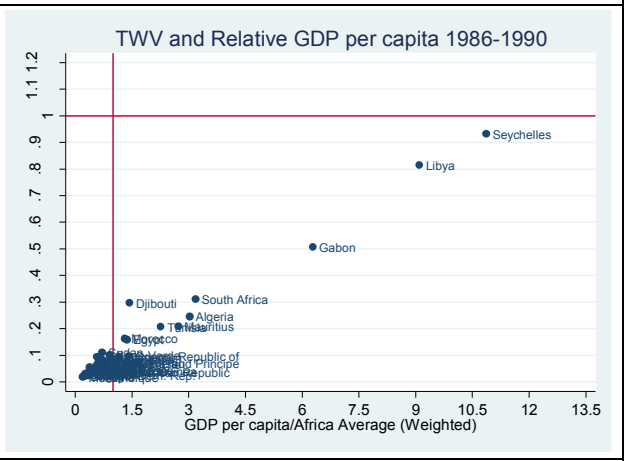
	TWV		EXPS	
	I	II	III	IV
GDP per capita/Africa Average	0.08620***	0.07912***	-2.50792***	-2.84819***
	[0.02383]	[0.02381]	[0.71491]	[0.79287]
Life expectancy at Birth	0.00102	0.00043	-0.03257	-0.0343
	[0.00094]	[0.00096]	[0.02519]	[0.02627]
Private Consumption/GDP	0.0001	0.00012	-0.03202***	-0.03583***
	[0.00033]	[0.00034]	[0.00966]	[0.01064]
Investment/GDP	0.00184***	0.00223***	-0.03194***	-0.04368***
	[0.00049]	[0.00052]	[0.01160]	[0.01298]
Urbanization	0.00344***	0.00164*	0.04347	0.09378**
	[0.00091]	[0.00096]	[0.03107]	[0.03729]
Telephone Lines/1000	-0.00225	-0.00099	-0.02717	-0.03763
	[0.00185]	[0.00182]	[0.03865]	[0.03953]
Net Inward FDI/ GDP	-0.00206***	-0.00214***	-0.00298	0.01186
	[0.00077]	[0.00076]	[0.01732]	[0.01929]
Openness (%)	0.00057***	0.00062***	0.02528***	0.02464***
	[0.00021]	[0.00022]	[0.00457]	[0.00484]
Debt Service /Exports	0.00043	0.00008	0.01011	0.00775
	[0.00032]	[0.00036]	[0.00742]	[0.00814]
Polity 2	0.00017	-0.00152**	0.01553	-0.0118
	[0.00066]	[0.00076]	[0.02226]	[0.02849]
WAEMU x GDP per capita/Africa Av		0.1222		2.45959
		[0.10447]		[3.84259]
WAEMU x Life expectancy at Birth		0.00258		-0.04212
		[0.00288]		[0.14064]
WAEMU x Private Consumption/GDP		0.00149		0.02596
		[0.00097]		[0.05089]
WAEMU x Investment/GDP		-0.00019		0.06317
		[0.00137]		[0.04216]
WAEMU x Urbanization		0.00662**		-0.11488
		[0.00258]		[0.11516]
WAEMU x Telephone Lines/1000		0.00336		0.2845
		[0.01480]		[0.43706]
WAEMU x Net Inward FDI/ GDP		-0.00086		-0.03138
		[0.00370]		[0.08114]
WAEMU x Openness (%)		-0.00026		0.00151
		[0.00054]		[0.02396]
WAEMU x Debt Service /Exports		0.00073		-0.01007
		[0.00078]		[0.02519]
WAEMU x Polity 2		0.00219		0.05063
		[0.00163]		[0.06814]
Constant	-0.21220***	-0.27693***	5.50394***	5.16191*
	[0.06138]	[0.06892]	[1.69471]	[2.79851]
Observations	260	260	140	140
Number of countries	32	32	30	30
R-squared	0.28	0.41	0.51	0.56

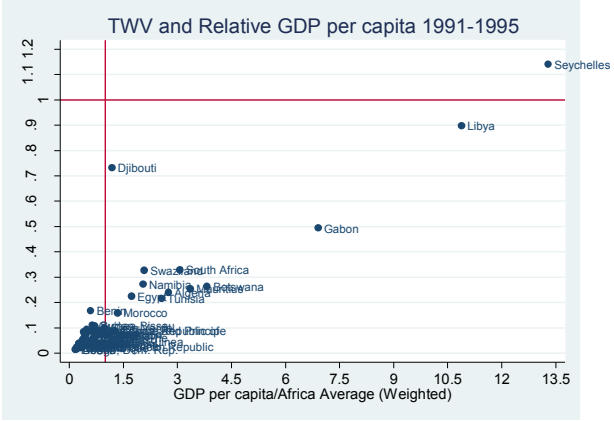
Standard errors in brackets

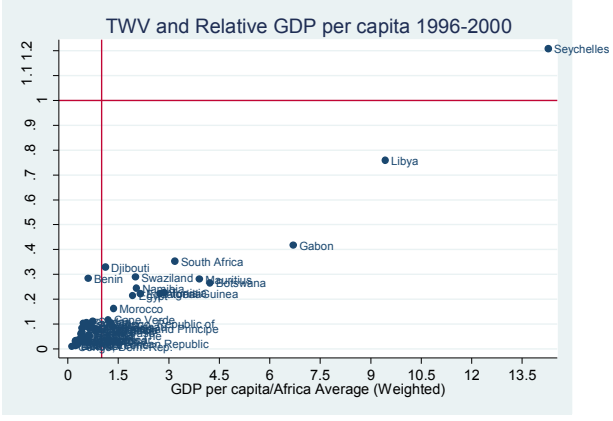
* significant at 10%; ** significant at 5%; *** significant at 1%

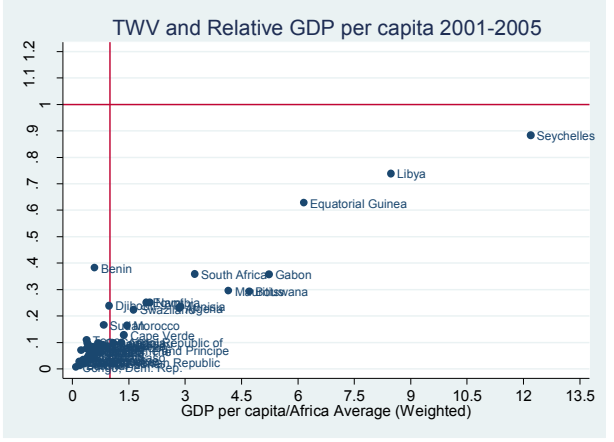
Figure 1a: TWV and Relative GDP per capita of African countries (1981-2010)











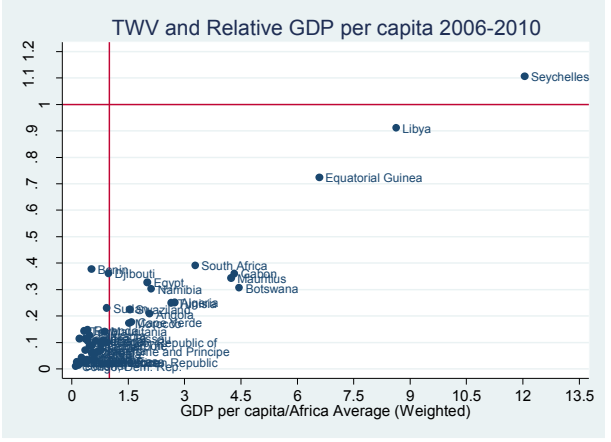
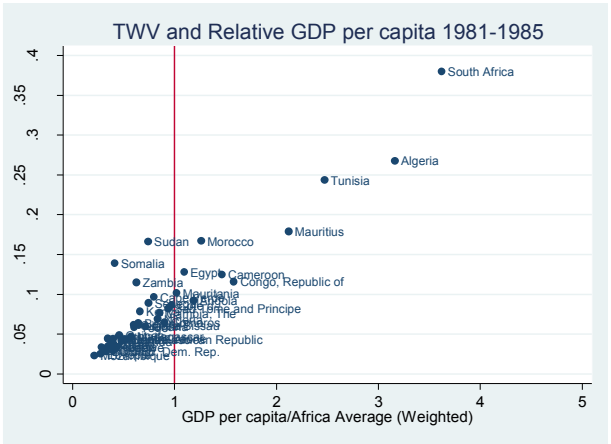
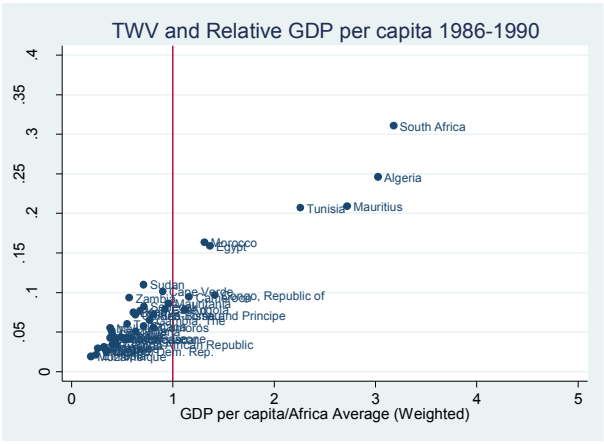
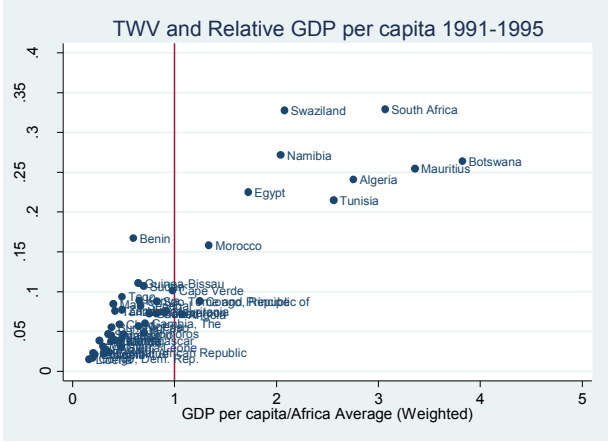
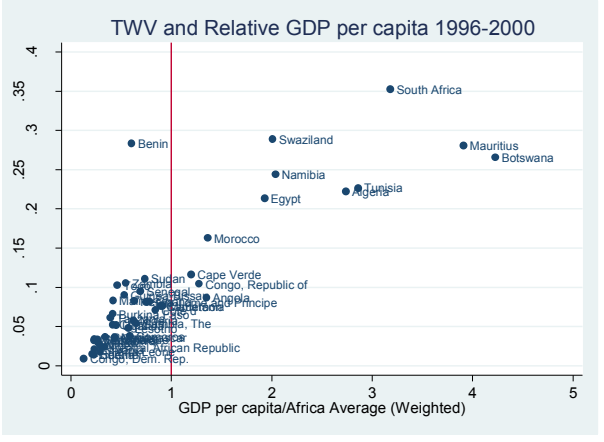
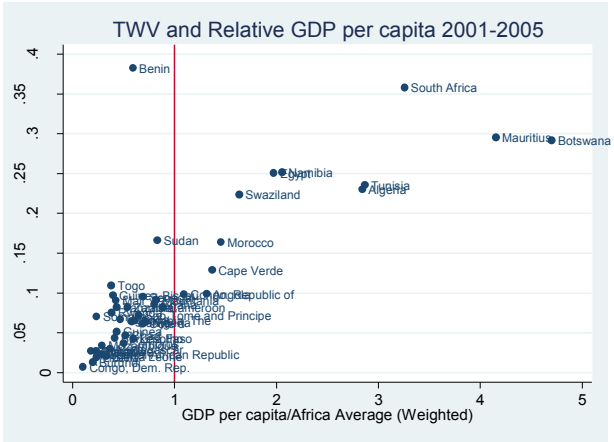
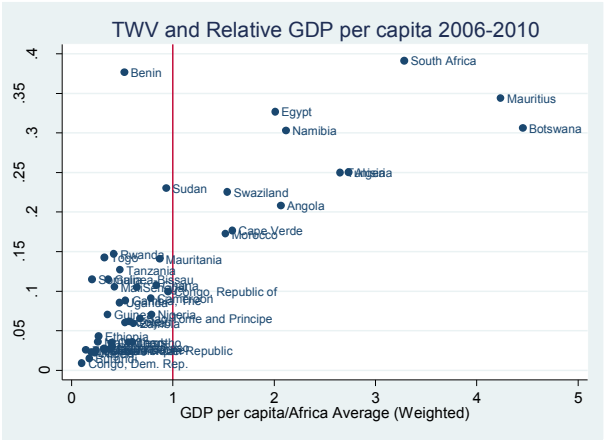



Figure 1b: TWV and Relative GDP per capita of African countries (1981-2010) excluding Djibouti, Equatorial Guinea, Gabon, Libya and Seychelles