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The Macroeconomics of African Commodity Boom and Its Implications for Macro Policy

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Abstract

The recent surge in commodity price has led to a growth in export earning and excellent performance in economic growth of Africa. Global commodity price are however characterize by volatility. The dependence on primary commodities and the nature of their prices entail both short term macroeconomic challenges and long term growth and development concerns. The study examined these macroeconomic issues, the available African evidence and their macro policy implications in Africa. The long term implications of the terms of trade of primary commodities, the volatility of their price and the implications of that for growth and industrialization aspiration of Africa are also discussed at length. Generally, there is relatively robust evidence that following a commodity boom there is a real exchange rate appreciation in natural-resource rich countries. In addition, the African evidence also shows a sharp rise in government spending following a booming commodity trade. The evidence on the shrinking of the manufacturing sector is generally mixed; however, the African evidence seems to be strong. The finding has implication for the need to have the capacity for macroeconomic management and strategic approach to avoid de-industrialization and ensure sustainable growth in Africa.

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I. Introduction

In this study an attempt to understand the challenge and policy implications of resource flows from a booming natural resource sector will be made. The next section sets to briefly outline the background for the study. It attempts to offer the stylized facts about the role of natural resource¹ (NR) related flows in African economies so as to understand the context under which the rest of the analysis is conducted. This will be followed by section three which offers the theoretical framework of the study and the related empirics in Africa. Section four concludes the study by offering the policy implications.

II. Global Commodity Price, Commodity Exports and Growth in Africa

Given the historical interaction with today's developed countries almost all African nations had become exporters of a limited range of primary products, and importers of manufactured goods, by the time of independence, in the 1960s. This was further accompanied by a demand for external finance, when export earnings were not sufficient to finance the level of public expenditures needed in the economy. This structure has not changed in any meaningful way in the post-independence era (See Table 1). In fact, the emergence of China and India is strengthening this pattern of trade by raising price of major African commodities recently. Table 1 shows a sample of countries that are both well diversified (such as Egypt and Tunisia) and a mono exporter ones. A detailed picture for all African countries is given in annex 1. The annex shows nearly all countries are dependent on a few commodities. Petroleum dominates the scene for Africa as a whole comprising nearly half of the continent's export (the African export share in the world being about 20 percent). This dependence on commodity export has resulted in "enclave" development with poor linkages to the rest of the economy, Dutch disease effects, lack of diversification, excess borrowing (and associated money supply) as well as high wage increases driven by the booming sector. In addition, poor governance, excessive foreign ownership and vulnerability to external shocks featured prominently in many African countries. On the positive side, such NR related flows are bringing much needed resource that could be used for growth and poverty reduction - thus NR flows have important macroeconomic implications. This study attempts to address the implications of this for policy making.

¹ The terms Natural resource, primary commodity, commodity are used synonymously throughout the paper

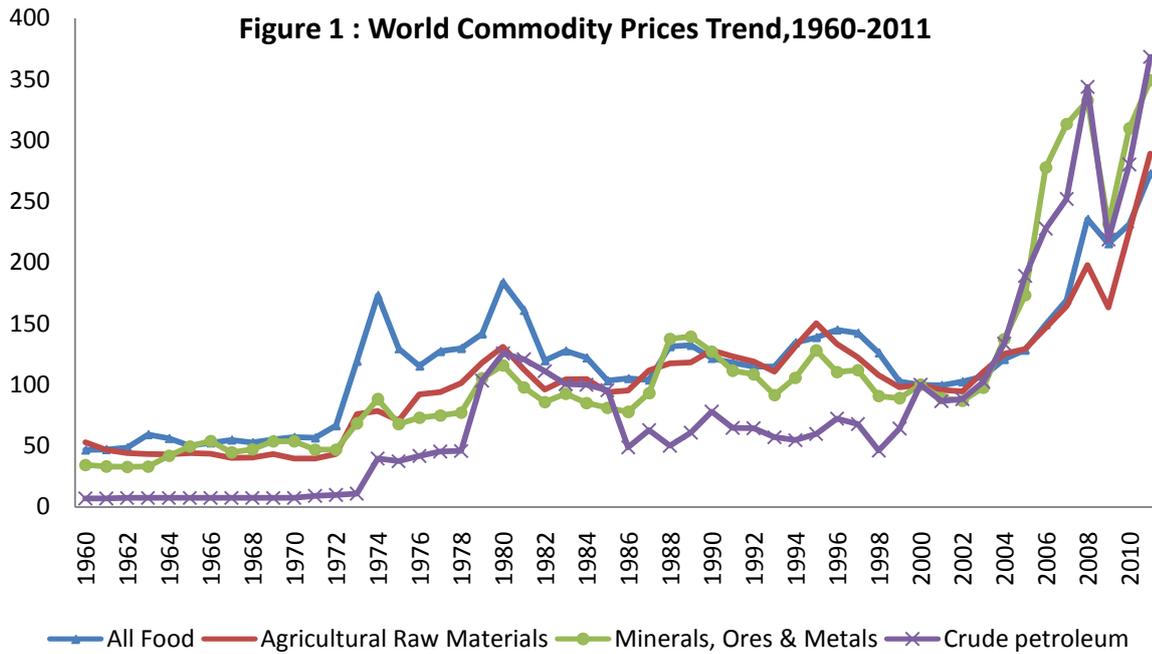
Table 1: Commodity Dependence in Africa (2004-2009)

Country Name	Primary commodities exports (% total Merchandise Exports)	Three main exports (with their share in total exports)	No of products accounting for more than 75% of Exports
	Average 2004-2009		
Africa*	57.5	Petroleum ,Crude (51.6%) [19.0%]*;Natural gas (4.2%) [24.2%] Petroleum , other than crude bituminous(3.9%) [3.3%];	25
Angola	96.1	Petroleum ,Crude(97%)	1
Botswana	85.6	Diamond (38.2%);Nickel mattes (31.3%);diamond(6.6%)	3
Burkina Faso	75.9	Cotton (54.4%); Gold (15.3%),Sesames seeds (8.1%);	3
Egypt, Arab Rep.	70.3	Natural gas (20.4%); Petroleum, crude (12.5%); Petroleum, other than crude (10.8%)	51
Equatorial Guinea	na	Petroleum, crude (76.5%)	1
Guinea-Bissau	79.5	Cashew nuts (92.9%)	1
Kenya	36.6	Black tea (12.3%) Cut flowers and flower buds, fresh (10.3%); Other aircraft propeller (7.7%)	29
Libya		Petroleum, crude (88.4%)	1
Sudan	99.8	Petroleum, crude (92%)	1
Tunisia	30.9	Petroleum, crude (12.3%); Men's/boys trousers and shorts, of cotton, not knitted (5.3%); ammonium phosphate (5.0%)	69
Zambia	50.8	Refined copper (56.4. %); Copper ores and concentrates. (8.2%); Cobalt mattes and other intermediate products of cobalt (6.0%)	4

Source: Annex 1

*Note: For Africa the values in [] shows African share of the world exports of the commodity.

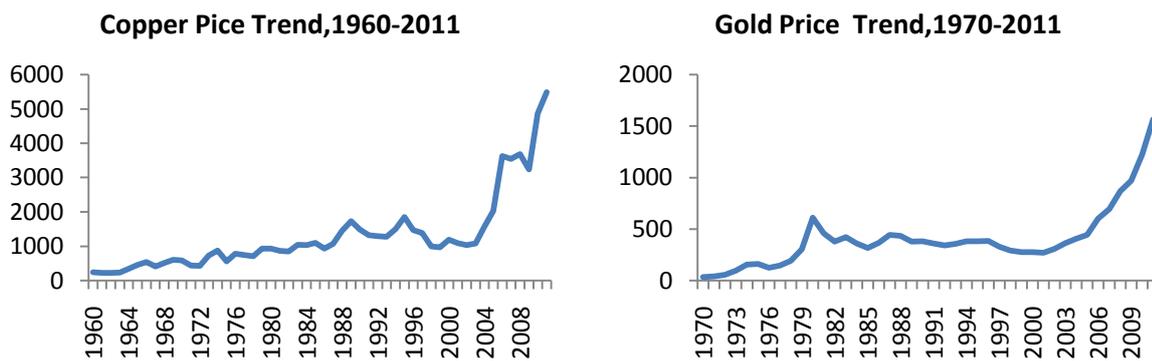
Historically, commodity price cycles have consisted of short-lived booms followed by longer periods of bust/stagnation. Since the mid-twentieth century, there has only been one previous major commodity boom between 1973 and 1980 (see Figure 1). The current boom (2003 and 2011) has been both the longest in the historical record and the broadest affecting all categories of commodities (UNCTAD, 2012). Commodity prices then fell sharply in late 2008 and 2009 following the global economic crisis before rebounding sharply in 2010-11. In aggregate terms, food, tropical beverages, and agricultural raw materials all experienced high prices since 2003 as can be read from Figure 1. Metals similarly reached high prices, especially for tin, nickel, copper and gold and it is expected that metal, food and agricultural raw material prices could rise even further in the medium term due to strong demand from emerging economies (IMF, 2012).

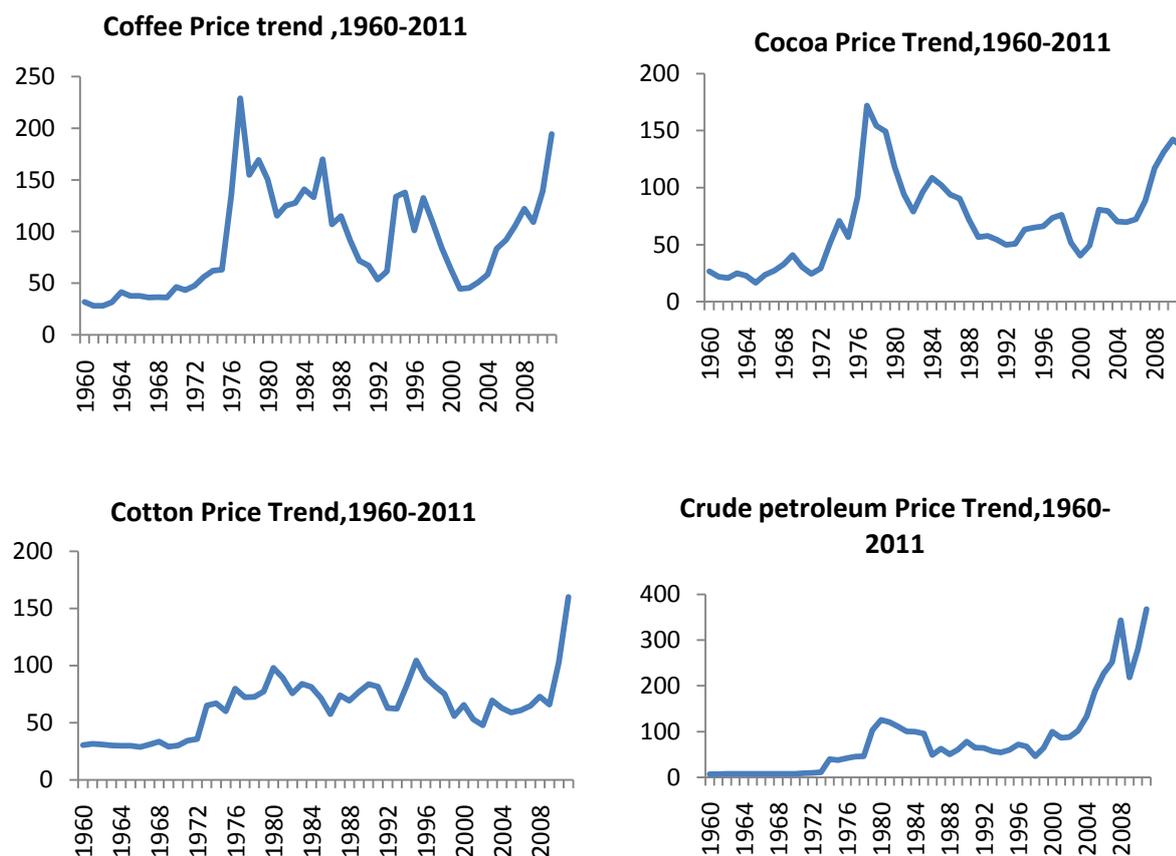


Source: Author's Computation using UNCTAD, 2012 Data base

By the end of 2011, average prices for energy and base metals in real terms were three times as high as a decade ago, approaching or surpassing their record levels over the past four decades (See Figures 1 & 2). Food and raw material prices also rose markedly, although they remain well below the highs reached by minerals, ores and metals. Many analysts attribute this surge in commodity prices to the sustained growth in emerging market economies over the past decade (See Heap, 2005 and World Economic Outlook, 2006, 2008; IMF, 2012).

Figure 2 : Individual Commodity Price Trends

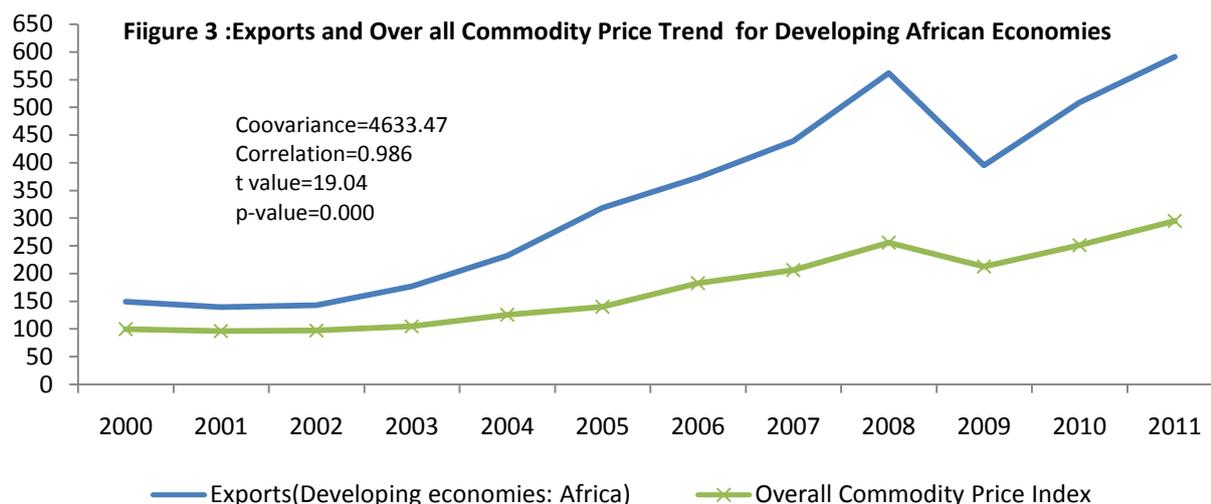




Source: Author's Computation using UNCTAD, 2012

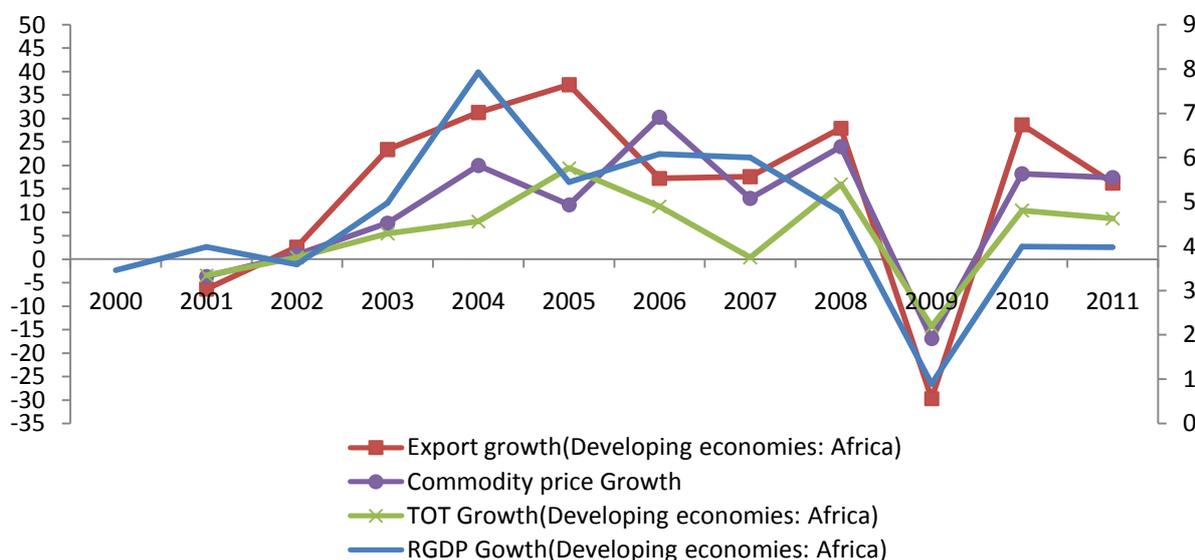
In Figure 2, differences are highlighted across four distinct commodity groups: energy, metals, food (and beverages), and agricultural raw materials by focusing on one or two specific commodities from each of the four major commodity groups—crude oil (energy), copper and Gold (metals), coffee and Cacao (food), and cotton (raw materials)—so as to see whether the broad patterns observed for commodity groups also hold at the commodity-specific level. As has been noted by IMF (2012) and UNCTAD(2012) these groups differ across many dimensions—in terms of the basic structure of the underlying markets, the nature of the commodity (for example, renewable versus exhaustible resource bases), and their association with global activity (for example, metals and energy are more important for industrialization and infrastructure building, and as such their prices may be more strongly correlated with the global business cycle than the prices of food and agricultural raw materials). A closer look at Figure 2 shows that the aggregate picture given in Figure 1 is true for individual commodities that are important for Africa too.

Figure 3 shows that commodity price trends and export earnings in Africa have a similar pattern over the last decade. Such an almost identical broad patterns is not unexpected given a very strong correlation coefficient of 98.6% between the two. What is more interesting is that the growth record in Africa has also broadly followed this pattern (See Figures 4& 5).



Economic growth in Africa in the last five years has been impressive, averaging about 5% per annum. The global economic crisis of 2008/09 interrupted Africa's buoyant growth by nearly halving its growth to about 3% after the crisis. This has bounced back to about 5% again in 2010. Figure 4, shows this growth surge is strongly associated with growth of commodity prices and the associate terms of trade improvement and export earnings (which in turn is driven by a demand surge in emerging economies).

Figure 4: Growth rates in Export,Commodity price, ToT and Real GDP for Developing African Economies (GDP Growth in Right Axis)



Source: Author's computation based on UNCTAD data.

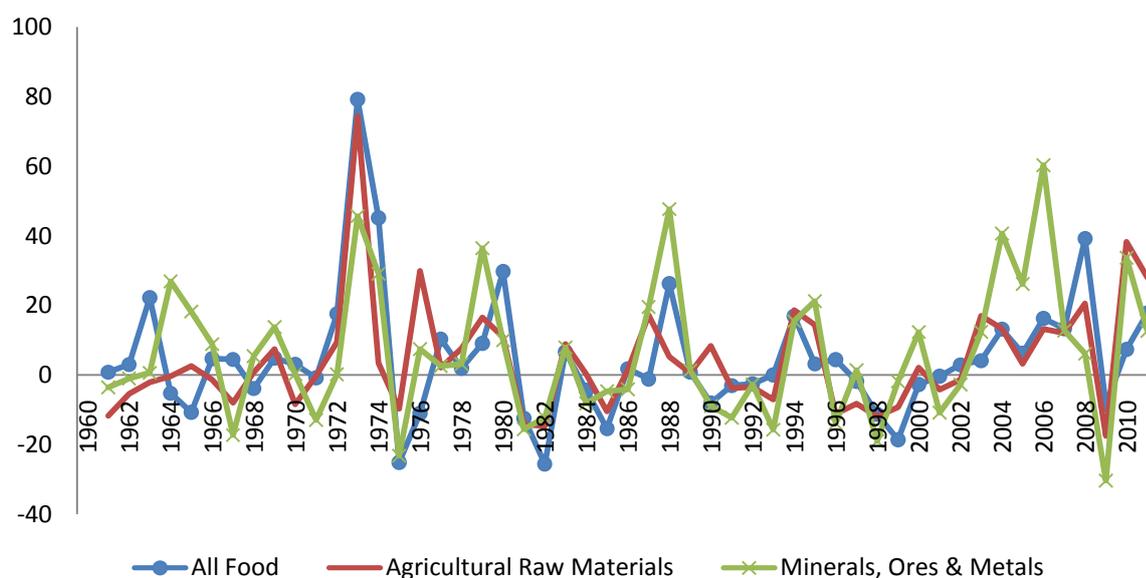
Note: Correlation between Growth and Exports is 0.64; Growth and ToT 0.54 & Exports and ToT 0.81.

After an exhaustive investigation, Arbache and Page (2008) found that this growth is propelled, not by economic fundamentals (or transformation) as such, but rather by high growth accelerations in natural resources exporters and better policies in all economies. This places much of the future of Africa's growth recovery, according to them, in the fate of the

mineral rich economies. That may be something of a worry for the sustainability of Africa's recent growth.

Though natural resource exporters have benefited from a sharp increase in commodity prices over the past decade (Figures 1&2 above), they have also experienced increased price volatility (see Figure 5) (See also World Bank, 2009; IMF, 2012).

Figure 5 : Annual % Change in Commodity Prices,1960-2011



Source: Author's Computation using UNCTAD, 2012 Data base

As Figure 5 (and Figure 11 below) show, short term instability of prices are inherent in commodity markets. The annual variability ranges from -40% in 2009 (for Minerals, ores & metals) to around 80% in 1973(for food and slightly lower for Agricultural raw materials). As noted by Brown and Gibson (2006), at a very basic level, such short-term price volatility is driven by a wide variety of factors including: changing weather patterns, business cycles in key markets, price speculation, conflict in producing or transit countries, exchange rate reforms, breakdown of the international commodity agreements, demand cycles and export dumping to mention some. However, there's much more to the story (See section 4 below).

One of the earliest work in the area was that of MacBean (1966) who found a supporting evidence that export fluctuations in developing countries were detrimental to economic performance. Other studies after MacBean (1966) confirmed the same negative relationship between export instability, caused by export price instability, and economic growth. They pointed out further that the negative effect of instability in exports on output, was through the creation of uncertainty in long-term planning coupled with imported input shortages (See MacBean 1966 for an older review). A recent study by Ocran and Biekpe(2008) on Sub Saharan Africa (SSA) using fixed effects panel data estimator has found , a negative relationship between instability in export earnings and economic growth. The results also indicate that the level of commodity dependence matter in determining economic growth in the region. According to this study the difficult growth experience of SSA is not solely due to

instability in export receipts. The question of continued dependence on a narrow range of primary commodities is also matter of great importance (Ocran and Biekpe,2008).

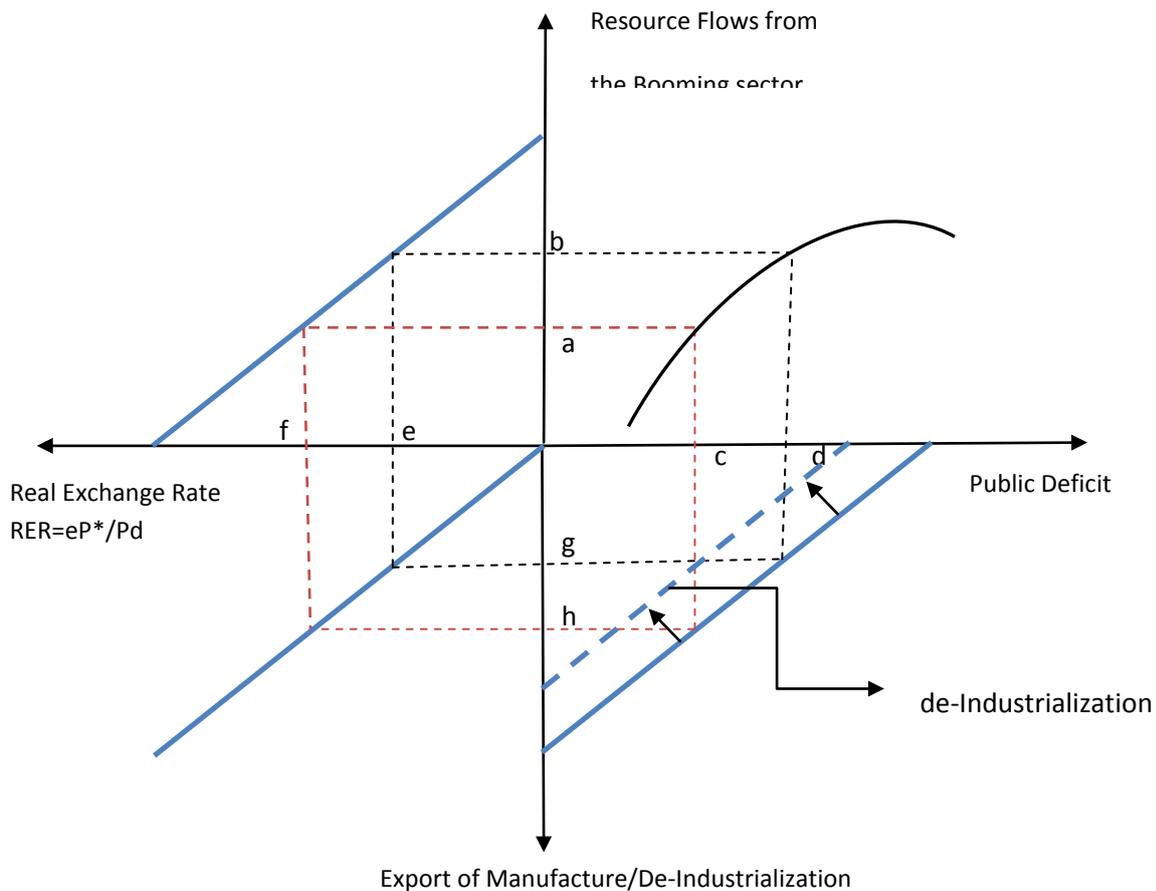
In sum, the recent surge in commodity price has led to a growth in export earning and excellent performance in economic growth of Africa. Global commodity price are however characterize by volatility. The dependence on primary commodities and the nature of their prices entail both short term macroeconomic challenges and long term growth and development concerns. The foreign exchange earnings from the booming primary commodity sectors and their volatility is captured in the macroeconomic literature through what is called the Dutch Disease problem and the fiscal response to external finance. Section three will examine these macroeconomic issues, the available African evidence and their macro policy implications in Africa. The long term implications of the terms of trade of primary commodities, the volatility of their price and the implications of that for growth and industrialization aspiration of Africa are taken in section four.

III. Resource Flows from Commodity Boom and Macroeconomic Challenges in Africa: Theory and Evidence

In this section an attempt to briefly review the theoretical aspect of natural resource flows from a booming sector and the African evidences on that will be made. The review is needed to find systemic explanation about the impact of such flows from macroeconomic policy perspective. The study could not be handled by a single theory but using an eclectic theoretical framework that could be deployed to inform different aspects of the issue. For this reason we will draw from the theoretical literature of primary commodity trade, the fiscal response to external finance, and the Dutch Disease literature.

The conceptualization of the macroeconomic ramification of resource flows from the booming sector which would be analyzed in this study could be summarized using Diagram 1. The Y axis in quadrant one (North-East) shows the resource flows from the booming sector (which has increased from point *a* to *b*). The fiscal response of rising public spending and a possible decline in tax revenue is summarized in X axis of the same quadrant using public deficit (which increased in absolute value terms from *c* to *d*). In quadrant 2 (North-West) the exchange rate appreciation effect of these flows are shown by a decline from point *f* to *e*. Quadrant 3 (South-West) shows the de-industrialization effect of the real exchange rate appreciation (shown by a decline in manufacture exports from point *h* to *g*). An inward shift of the schedule in the 4th (South-East) quadrant may indicate the long term growth and de-industrialization effect of the specialization in primary commodity production. The rest of this study will examine in detail these different facets of the macroeconomic and de-industrialization ramification of resource flows from a booming natural resource sector.

Diagram 1: Resource Flows from a Booming Sector and Its Ramification.



3.1 Resource Flows from a Booming Sector and the 'Dutch Disease' in Africa

The Theory

Historically, the 'Dutch Disease'² literature originated from a discussion of the problems associated with managing revenue from a booming sector of the economy³. Popularized, among others, by the works of Cordon and van Wijnbergen, the 'Dutch Disease' concept has come to play an increasingly important role in the discussion of the macroeconomic impact of resource discovery (including foreign aid).

The argument runs as follows. Revenue is obtained from a booming sector. If part of this is spent on non-traded goods (the 'spending effect'), this leads to a real appreciation in the relative price of non-tradables relative to tradables which in turn leads to contraction of the tradable sectors - or 'de-industrialisation', to use the original term (Neary and Wijnbergen, 1986: 15-17). Within a typical 'Dutch Disease' model, this spending effect not only raises the demand for 'specific factors', which are initially employed within the booming sector, but also, and perhaps more

² This term was first coined, in print, in *The Economist* of November 26, 1977 (See Cordon, 1984). For the discussion of its effects in The Netherlands see Ellman (1981).

³ Which, in the case of The Netherlands, is the natural gas sector.

importantly, the demand for inter-sectorally mobile factors, such as labour. This is labelled the 'resource movement effect' and reinforces the spending effect (Neary and Wijnbergen, 1986: 19; Corden 1984, van Wijnbergen 1984). The growth effect of such a resource shift is considered to be negative, since traded sectors are characterised by 'learning by doing' (i.e. dynamic & technological) externalities and increasing return to scale which will have a higher and positive effect on growth (van Wijnbergen, 1984, 1986, Edwards and van Wijnbergen, 1989; Brahmhatt *et al* 2010). It should be noted, however, that the exact form, which this effect takes, could also depend on the flexibility of prices within the factor market. Corden (1984) notes that, if the effects of the boom "have raised the real wage in flexible-factor price model, then with a rigid real wage it would reduce unemployment instead, while if it would have reduced the real wage in the flexi-price model, it would generate unemployment in the fix-price case" (Corden, 1984:369). Thus, as Brahmhatt *et al* (2010) noted, if Dutch disease affects labour-intensive industries more than capital-intensive ones and increases capital intensity in general—as found by Ismail (2010)—it could increase unemployment as it did originally in the Netherlands and the United Kingdom (Brahmhatt *et al* 2010).

This analysis has its origins in the 'dependent economy model' of Salter (1959) and Swan (1960). In both models, small economies are assumed to be price takers within international markets, and hence their terms of trade is taken as given. However, changes in the external economy, such as might be associated with a rise in overseas prices, or excess demand, may disturb the pre-existing equilibrium. This could result in a switching of demand from the traded to the nontraded sector. This, in turn, could entail a rise in the price of domestic, or non-traded goods and, hence, a subsequent supply reaction. Nonetheless, the final result will depend on a number of factors, including the relative speed and magnitude of different effects (Swan, 1960: 55-62). Within Salter's formulation, the reaction to such changes, of, say, higher foreign prices, or excess demand, will depend on two main factors. Firstly, on their impact on domestic price, and, secondly, on the elasticity of substitution between the traded and the nontraded sector, from the supply side and the elasticity of demand substitution from the demand side (Salter, 1959:230). Focusing on these issues the 'dependent economy' model helps to understand such sectoral disequilibrium⁴.

According to Wijnbergen (1986), the resource allocation consequences of the 'Dutch Disease' in Africa is to shift labour from agricultural cash crop production in rural areas to service employment, mostly in urban areas. The resulting increase in labour costs within the external sector effectively reduces its competitiveness. Applying this theory to data for a number of African countries, he concludes that "increases in real volume of foreign resources [such as aid] causes real appreciation". However, White (1992) and Geda (2002) noted that Wijnbergen's estimations suffer from a number of econometric problems. Be that as it may, it is worth questioning whether his theoretical description itself tallies with stylized facts in a typical African economy. It could be argued that the theoretical reasons forwarded to describe the mechanism of casual links does not actually fit with the stylized facts for a typical African economy for the following reasons⁵ (See Geda, 2002). First, it could be argued that mobility of resources does not occur that easily in Africa, especially in the short run. Thus, in the short-run, inflation arising

⁴ Edwards and van Wijnbergen (1989) and van Wijnbergen (1986) argue for similarities between the discovery of natural resources and aid inflows and, hence, for similarities in the macroeconomic impacts of both. Thus, the aid literature uses this framework.

⁵ Such a distinction is important because policy interventions, at different stages of the mechanism, can be effective when the propagating mechanisms are realistically captured.

from supply bottlenecks in the non-traded sector is likely to represent a more important influence than demand for labour which is hypothesised by van Wijnbergen. Thus, the spending effect is likely to be important in bringing about inflationary pressure. Second, in most urban areas in Africa there exists sufficient labour to meet the demand that may arise from the non-traded sectors, such as services. In fact it is highly probable that despite the urban unemployment, the wage rate may increase due to structural rigidity in the non-traded sectors such as the food sector following the boom that will raise the efficiency wage for the urban unemployed. Thus, although the spending effect may result in a real appreciation in exchange rate, this will usually take place in the context of idle labour in urban areas and a sticky production structure in both the non-traded (especially food) and traded sectors, especially for perennial crops and minerals. Hence, we cannot be sure how the market clears. However, within a dependent economy framework, these new sets of rigidities could express themselves in the form of domestic inflation. Geda (2002) have found a supporting empirical evidence for the latter stylized facts in Africa.

The Empirical Regularity in Africa

There are a number of Dutch Disease studies in Africa. However, most of these studies are related to the impact of Aid flows which are assumed to exhibit similar macroeconomic ramifications (See for instance, van Wijnbergen 1986, White 1992; Younger 1992; Geda 2002, among others). We have focused in this study, however, on those 'Dutch Disease' studies related to a booming Primary commodity sector.

Country-specific studies have been undertaken with the aim of assessing the possibility that a 'Dutch Disease' effect may be present in various African countries. Benjamin *et al* (1989) constructed a CGE model for Cameroon to study the 'Dutch Disease' effect Cameroon's oil boom. The authors argue that the treatment of tradables in traditional Dutch disease models may not be plausible for some countries. They separate tradables into exportables (mainly agriculture) and importables (manufactures) and assume that locally produced goods are imperfect substitutes for importables. Their results point to the important differential impact of a boom in the importable and exportable goods sector, owing to imperfect substitution between goods from these sectors. The impact in the latter, which is generally agricultural (exportable), being negative while that in the former, which is mainly manufacturing (importable), could in fact be positive⁶. Kayizzi-Mugerwa (1990) formulated a model of Zambia, which aims to examine the impact of copper prices within that country. The model's underlying theoretical formulation is the 'Dutch Disease' and the author maintains that the 'Dutch Disease' model is largely validated in the case of Zambia. A similar study, which analyzes the Egyptian experience of an increase in oil exports, within a 'Dutch Disease' model framework is reported in de Macedo (1982). Finally, a recent study by Treviño (2011), has employed a heuristic comparative approach suggested by Ismail (2009) to search for evidence of Dutch disease in oil-rich countries of the Central African

⁶ Fardmanesh (1991a, 1991b) has undertaken a similar analysis for oil exporters. He notes that, contrary to the core 'Dutch Disease' model, the manufacturing sector of oil exporting developing countries has in fact expanded following the oil boom. Indeed, a similar pattern is observed for Egypt and Nigeria. Neary and Wijnbergen (1986) have accommodated this phenomenon within the core model by relaxing the assumption of free trade. They stressed that, in many countries, these sectors are protected (i.e. semi-traded). Benjamin *et al* (1989) have explained this through the imperfect substitution assumption, while Fardmanesh (1991a, 1991b) prefer to attribute this to a rise in the world price of manufacturing that was witnessed in the wake of the two oil price hikes. However, he does not commit himself to a possible mark-up pricing scheme, which his analysis might otherwise suggest. Rather, he bases his analysis on the assumption that a rise in manufacturing price, possibly due to a mark-up pricing scheme, leads to a rise in output. Nonetheless, the main reason for expansion could also relate to the new foreign exchange earnings, which relieve the import compression problem, which previously had represented a constraint in the manufacturing sector.

Economic and Monetary Community (CEMAC). Treviño (2011) noted, while these countries have benefitted from high international oil prices in recent years, they have also experienced relatively large real exchange rate appreciations, raising concerns regarding the presence of Dutch disease and casting doubts on their ability to achieve high growth and employment in the long run. Treviño(2011) focused on the 14 member countries that constitute the CFA franc zone separating them into net oil importers and exporters. His findings are broadly consistent with the presence of Dutch disease in the second group of countries during the oil-price boom.

Ian and Karl (2003) picked Equatorial Guinea as a prime example of all the ills associated with the Dutch Disease following significant oil and gas discoveries. The IMF (2005) study broadly agrees with these conclusions. In its empirical study conducted on South Africa , a positive long-run relationship between real commodity prices and the real effective exchange rate is found. A one percent increase in real commodity prices is found to be associated to a half percent appreciation of the real effective exchange rate (IMF 2005). A Dutch disease phenomenon is also observed in Kenya following the coffee boom of 1976-1979 (when the coffee price quadrupled). Private agents, including peasants, were able to recognize the boom as temporary and responded by saving a substantial (about 70%) part of it. Constrained by foreign exchange controls to domestic assets, they translated their windfall savings into capital formation very rapidly. This led to a construction boom (reflected in an increase of the relative price of non-tradable capital goods). While the windfall was not taxed directly, government revenue rose - around half of the windfall accrued to the government. The public sector response led to a recurrent expenditure boom and a budget deficit - fiscal crisis, indebtedness and a sharp cut in capital spending by early 1980s when coffee price returned to the normal level (Bevan *et al*, 1993).

In contrast to the above studies, examining the effects of the coffee boom in Tanzania, Musonda and Luvanda (1991) fail to accept the validity of the 'Dutch Disease' model for Tanzania. Rather, they emphasize the importance of examining the pattern of the distribution of gains from the booming sector in determining its overall outcome. Love (1994) has shown the 'Dutch Disease' effect of diamond production in the agricultural sector (excluding livestock)⁷ of the Botswana economy⁸, although his general results are contested by other researches (see for instance Rodrik, Acemoglu *et al* 2001a &2001b; Harvey and Lewis 1990). Limi (2006) for instance explored the case of Botswana and concluded that governance determines the extent to which the growth effects of resource wealth can materialize, and that the Dutch disease argument has little effect on the linkage between natural resource abundance and economic development. Carrying a similar study for Nigeria, Sala-i-Martin and Subramanian (2003), found a negative and nonlinear impact of natural resource abundance on growth which they argued arises from its effect on institutional quality. They conclude that waste and corruption from oil (rather than Dutch disease) is responsible for Nigeria's poor long-run economic performance. Finally, IMF (2009) analyzed the case of Chad, concluding that the effects of Dutch disease are hard to evaluate, not only because of lack of information but also because the non-oil sector is highly underdeveloped. After exploring several indicators, the IMF study concluded that there is little evidence to support the presence

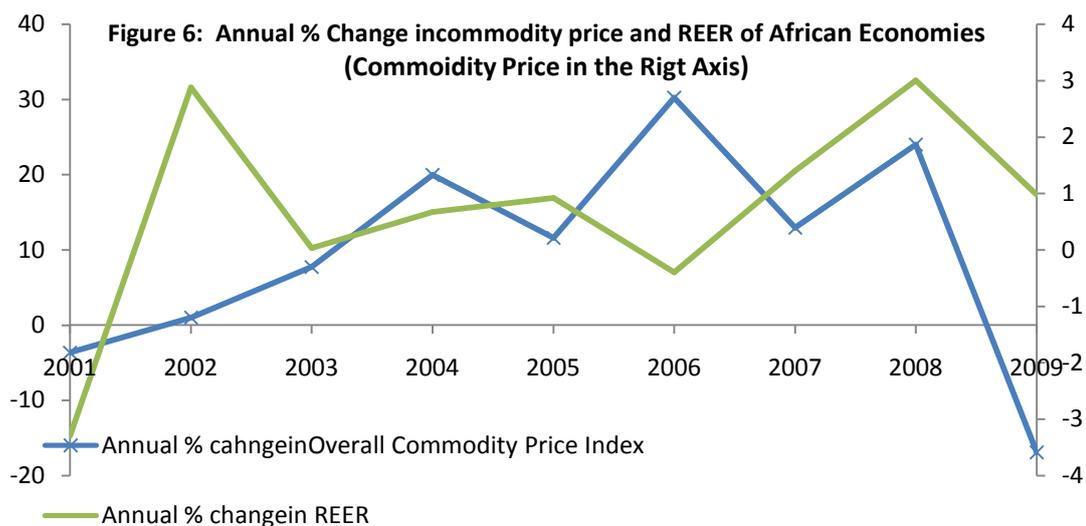
⁷ Love (1994) has undertaken an excellent political economy analysis of the spending effect from the booming sector in Botswana. He notes how government expenditure unduly favors livestock development in an effort to facilitate the transition by a traditional dominant group of cattle owners to a contemporary capitalist class of commercial farmers. He observes how the interests of this group is maintained and legitimized by orthodoxy in economic thinking.

⁸ A number of Ph.D. thesis and other studies aiming to describe the Dutch Disease effect of oil in Nigeria have also been undertaken, mainly in North America Universities (see Geda, 2002).

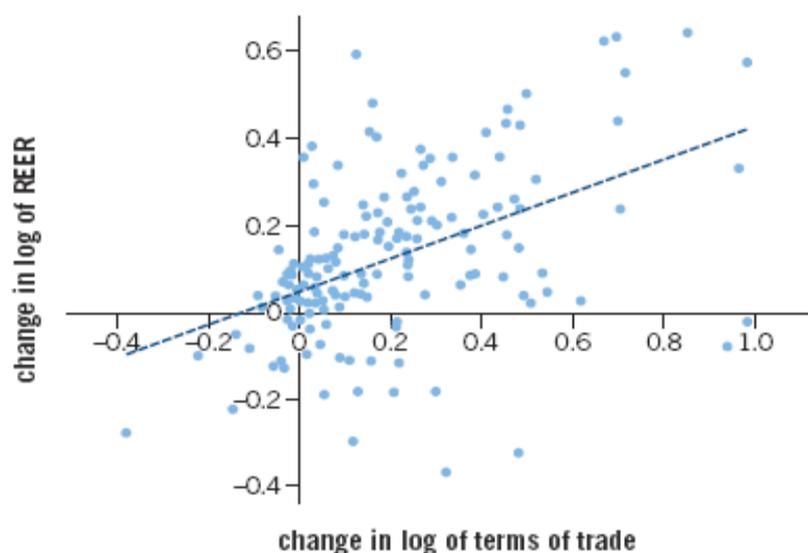
of Dutch disease, with the exception of a significant increase of the wage bill, likely explained by the expansion of government expenditure during the oil boom (expenditure effect), rather than by shifting labor toward oil production/refining (resource-movement effect).

As can be read from the above evidence on individual countries, the Dutch disease phenomenon has focused on the impact of resource- abundance on public spending, the real exchange rate and its effect on reallocation of resources across sectors. This has in turn typically identified through the observation of an appreciation of the real exchange rate, a decline in manufacturing output/export or de-industrialization, and an expansion of non-tradable activities. Brahmhat *et al* (2010) noted that there is relatively robust evidence that the terms of trade increase (following a commodity boom) causes real appreciation in natural-resource rich countries (see Figure 7 below). In 22 Sub-Saharan African countries about 80 percent of the variation in real exchange rate is found to be associated with movement in prices of commodities (Cashin *et al* 2003 cited in Avendaño *et al* 2008). The evidence on the shrinking of the manufacturing sector in developing countries in general is however mixed (see Sala-i-Martin and Subramanian 2003; Brahmhat *et al* 2010). This mixed result is because the possibility of resource curse in many cases is also a function of factors such as human capital, quality of institutions and public policy. Recent study by Ismail (2010), who used detailed, disaggregated sectoral data for manufacturing finds a strong evidence that, in general, a 10 percent increase in an oil windfall is associated with a 3.4 percent fall in value added across manufacturing sectors (Ismail, 2010 cited in Brahmhat *et al* 2010). The evidence shown as Figure 12 in the next section seems also generally to confirm this finding for Africa. Given this evidence, we will conclude this section by briefly observing the recent data on the issue in Africa.

Figure 6 shows, except perhaps in 2006, a strong positive association between the growth in commodity price index and real effective exchange rate in Africa. The aggregation of the real exchange rate figure across the continent might hide a lot of the strong association that could be observed at country level. In fact, Avendaño *et al* (2008) and our own investigation (not reported) shows a much more strong association for a number of African countries where China's commodity import demand is most felt recently. In Avendaño *et al* (2008) study for some countries such as Zambia the appreciation exceeding 50 per cent. Brahmhatt *et al* (2010)'s evidence shown as Figure 7 also supports this strong correlation.



.Figure 7: Real Exchange Rate and Terms of Trade (Commodity Prices)



Source: Brahmhatt et al (2010)

The effect of this real exchange rate appreciation is to make resource rich countries lose competitiveness in the traded sector (such as manufacturing) and hence push them to de-industrialization. This tendency is shown for Africa in Figure 12 (section four below) and its detrimental developmental implications are discussed at length in the same section.

In sum, in this section an attempt has been made to assess the theoretical and empirical literature about the Dutch Disease effect of recent flows from the natural resource sector in Africa. The literature generally shows that, first the presence of the 'Dutch Disease' effect across countries as well as its variation across countries and commodity categories. Interestingly, in almost all cases, government spending on the nontrade sector is found to have a statistically significant effect on appreciation of real exchange rate. This is entirely plausible since most capital flows from a booming sector in Africa are directed to the public sector. Second, the evidence in this section also

shows that the export of the booming primary commodity sector is negatively associated with export of tradables (usually manufacturing). Third, there is a need for serious macroeconomic management, in the face of capital inflows from the booming sector. In this respect, an important instrument of macroeconomic management is an optimal management of government revenue and spending - an appropriate fiscal response. This is discussed in the next section.

3.2 The Fiscal Response to Commodity Boom: Theory and Evidence in Africa

The Theory

The second important macroeconomic issue related to resource flows from the booming sector is the *government's fiscal response* to such flows. The fiscal response literature is recently being used to analyse aid effectiveness. However, originally, the aid literature borrowed the analytical approach from the economics of a booming sector (see Salter 1959; Swan 1960; Neary and Wijnbergen, 1986). It appears the aid literature has developed the fiscal response literature to a considerable degree (see White, 1992 for a survey) which is helpful for deploying it in the analysis of capital flows from a booming sector. The first important point in this literature is that the capital inflows may represent a useful substitute for savings⁹. Indeed, these commentators note that a large fraction of such flows are likely to be used to increase consumption. In his original work, Griffin (1970) suggested different avenues through which a decline in savings might take place. The first such avenue could arise as a consequence of capital inflows' negative impact on government's efforts to levy or collect tax. Indeed, such inflows might even provide an incentive for governments to *reduce* tax. The second avenue, suggested by Griffin, relates to the presumed negative effect of capital inflows on private savings and, finally, to its stimulating impact on consumption of importables and exportables (Griffin, 1970: 106-107). The first avenue, taken together with the nature of public expenditure in recipient countries, has been articulated around what is termed as '*fiscal response*' literature. This latter literature builds on the works of Heller (1975) and its extension by Mosley *et al* (1987). This section will briefly review this analytical framework (and the empirical regularity in Africa) to understand the fiscal response of recipient governments in the face of capital inflow from a booming sector.

Heller's original contribution is articulated in a model that assumes that public sector decision-makers maximize a utility function comprising public investment, public consumption¹⁰ and borrowing from domestic sources (Heller, 1975). By taking, the variables as a deviation from their targeted values, the utility function is operationalized through a functional form that ensures diminishing marginal utility from each of the choice variables. The targets are further specified as a function of current and lagged values for a number of macroeconomic variables. By

⁹ See Critics of Chenery and Strout's (1966) two-gap model such as Griffin 1970, Griffin and Enos 1970, Weisskopf 1972 who have argued along this line. Papanek (1972), on the other hand, argues that these critics have mistaken association for causation. The association, which Papanek is referring to, is between low saving and high foreign capital inflow for common exogenous reasons. Bowles (1987) has attempted to investigate the causality question using the 'Granger Causality' concept. His analysis suggests that casual relationships are not universal and that, in countries where such a relationship does hold, that it is found to depend on the structure of aid [such flows]. Gupta (1975) has used a simultaneous equation model, which allows for both the direct and indirect effects of such flows. He suggests that the negative effects of capital inflows have been grossly overestimated and that the total indirect and direct effects of such inflows may also be positive. However, his estimation of the savings function shows a negative coefficient, both with aid and with foreign capital inflows in general. This 'aid-saving debate' has continued till today.

¹⁰ Public consumption is further disaggregated into civil consumption (comprising government administration, public debt servicing, security and diplomacy expenditure) and 'socio-economic' consumption (comprising non-capital current expenditure).

maximizing this function, subject to the constraint that government expenditure should equal revenue (including foreign inflows to the public sector), Heller solves for the set of first order equations that yield structural equations for estimation. Mosley *et al* (1987) have basically adapted and extended Heller's model, by including capital flows' (in their case aid) impact on growth of output and minor changes in the presentation of the public sector variable specification. The impact on growth is considered by further specifying the target level of government investment. Mosley and colleagues made two extensions to Heller's model. First, the private investment section of the model is further specified to include the price effects (a 'Dutch Disease' type of relative price change) of such inflows. Second, income is specified as being determined by a production function comprising public and private capital stocks and labour.

Another criticisms of Heller's model, which is addressed in the Mosley *et al* (1987) study, relates to the possible indirect positive impact of capital inflows on taxes through its presumed positive impact on output (income). White (1993) has attempted to reformulate Heller's model by explicitly considering these indirect effects. Closer examination of White's (1993) reformulation reveals that the new (demand driven) model extremely relies on the assumed existence of a Keynesian closure (ie.; the model assumes the existence of a demand-constrained developing economy). This assumption is taken almost as axiomatic, and, hence, various conclusions, including the possibility that such flows may raise taxes, are drawn. However, such an assumption cannot be sustained, in light of the substantial literature relating to the 'Dutch Disease' effect. Further, the fact that most developing countries, particularly in Africa, are, in fact, supply constrained, would tend to throw further doubt on this assumption.

A major shortcoming of this approach is the assumed existence of such a decision-making framework, in the form of a public sector utility function¹¹. The framework does not reflect how decisions about financing public spending are actually made in most African countries. An alternative approach (see Geda, 2002), which tallies more closely with the stylized facts in relation to Africa, may be outlined as follows. First, policy makers will have a targeted level of expenditure, based on projected growth and social development objectives. These policy makers are confronted with three costly means of financing this desired level of expenditure. The first alternative is to finance this through foreign capital inflows. However, such an option brings with it implicit costs, in the form of policy conditionality (if it is aid), as well as the accumulation of debt¹². If it is from a booming sector the costs are almost none. The second alternative is to finance this expenditure by raising revenue domestically. The implicit costs of this option arise from the institutional problems as well as political implications associated with having to levy and collect taxes. Finally, if the desired level of expenditure cannot be financed through these two mechanisms, governments may be forced to resort to deficit financing or expenditure reduction (hence lower growth ambitions), to the extent the latter is tolerable. However, deficit financing and poor growth are likely to have costly political implications in the form of inflation and possible social unrest.

¹¹ . Even if one accepts this assumption and framework, *ala* Freidman (1953), nevertheless such a framework has a serious shortcoming in its formulation (see Geda, 2002). Although the constraint is meant to handle a trade off, the functional form adopted is similar to utility functions related to linear expenditure systems which are based on the additive assumption, which, in turn, requires independence among choice variables (See Alchian (1971), Koutsoyiannis 1975 for a discussion and further reference) which is not obeyed in these models (see Geda, 2002).

¹² This inevitably assumes the existence of a stable political structure as well as a government concerned with long term issues. However, the prevalence of government short-termism in most African countries may result in a lower priority being attached to such long-term issues.

The choice of these alternative mechanisms moves *recursively* from the first to the third, depending on the availability of foreign finance as well as the associated implicit political/developmental cost attached to each by policy makers¹³. If, for geo-political or economic supply reasons, foreign inflows are made easily available or a booming sector exists, then this will represent the least cost financing mechanism, since it simultaneously minimizes the political risk associated with deficit financing (and poor growth) and, at the same time, ensures the desired economic and social expenditure are carried. However, such inflows might have the effect of discouraging domestic revenue collection and encouraging public expenditure¹⁴, sometimes in an undesired direction, as a consequence of fungibility. In this *recursive* approach to the financing of public expenditure, which instrument of financing should be used at a particular point in time is entirely an empirical question¹⁵. More specifically, this choice will depend, to a great extent, on the availability and timing of foreign inflows and the associated political cost valuation of different instruments of financing by policy makers. If instead the capital inflows is generated from the booming sector, as opposed to aid, such conditionality will not be there yet the political cost of levying and collecting taxes could be avoided. The latter could discourage government revenue collection and encourage public spending. Thus, the effect could be theoretically more severe in the latter case.

The Empirical Regularity in Africa

In many developing countries, exports of primary commodities constitutes a substantial share of government revenues directly (e.g., dividends and royalties) and indirectly (e.g., income tax and export tax). Excessive volatility of commodity prices, with cycles of booms and busts in real global economy are creating problems for macroeconomic management and planning. As a result, many governments in commodity-dependent developing countries face extremely variable revenue (See Dehn,2001; Westerhoff,2005; Mehraraand Oskoui,2007; Humphreys and Sandbu, 2007). Thus, in terms of fiscal response such countries may encounter (a) a sudden surge and volatility in revenue, (b) the associate surge and volatility in spending, and (c) problem of carrying optimal level of saving and a likelihood of indebtedness. We will briefly review the empirical evidence on each in Africa.

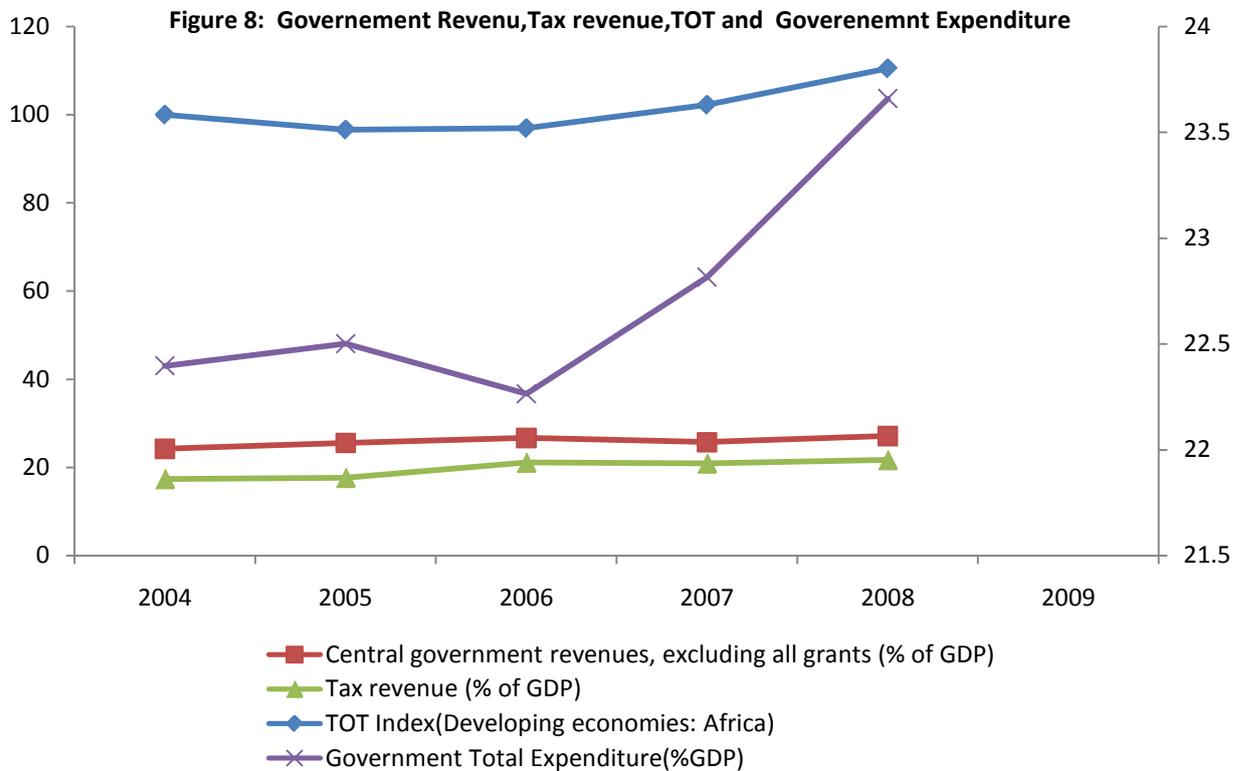
Figure 8 shows the trend in government expenditure , total revenue, tax revenue (all as %GDP) and overall commodity price index for Africa in the last five years. Taxes and revenues have been more or less constant, while expenditure shows a steady growth in tandem with the

¹³ In principle this may be captured by using a cost minimization function, subject to the desired growth/ developmental expenditure target. This approach is similar to Heller's (1975) model, except that the concern for budgetary equilibrium has been replaced by a concern for attaining the desired (downward adjustable) expenditure level, even if that implies incurring a budget deficit. However, such a function is difficult to quantify since these costs are political in nature and could vary, depending on the valuation placed on them by policy makers in different countries. In Geda (2002) an ordinal rating of the associated costs beginning with foreign inflows, for which costs are lowest, followed, in ascending order, by domestic revenue and deficit financing has been followed. This is assumed to be the relevant stylized fact in the African context. Formally, since such a cost function takes the form of $C=f(P_i, F_i)$ where $i=1,2,3$ and P_i is the cost of using one of the financing mechanisms (F_i) subject to the constraint $I_g^*=g(F_i)$ where I_g^* is desired level of growth, the Lagrange based optimization equation $f(P_i, F_i) - \lambda [g(F_i) - I_g^*]$ will yield a recursive equation structure for estimation if it is assumed that $P_1 < P_2 < P_3$ (see Geda, 2002 for detail).

¹⁴ See Romer (1989) for an analysis of such funds and their macroeconomic implications for countries, which depend on commodity aid and associated counterpart funds.

¹⁵ Such a decision-making framework has a simple and clear implication for empirical work. From the point of view of the government of a developing country, the supply of foreign inflows may be assumed to be exogenously determined. However, such inflows are likely to affect both tax revenue and government expenditure. Thus, an econometric model with a recursive structure, which simultaneously allows for adjustment to past disequilibrium, is likely to represent a relevant estimation technique. See Geda (2002) for its application in Africa.

improvement in terms of trade - indicating the fiscal response to the recent commodity boom in Africa.



Beginning with *government revenue*, a fiscal transmission mechanism of the resource curse takes place through the extreme volatility of resource revenues— which can lead to waste, boom and bust cycles, and excessive borrowing (Dabán and Jean-Luc Héris, 2009). Waste could arise from the pressure that large and sudden increases in resource-funded spending put on the country's administrative capacity. It could also arise from the frequent upward and downward adjustments of expenditures, and the ensuing poor quality of spending programs that are increased or downsized at the last minute, in line with fluctuating revenues. Excessive borrowing could arise from the government's difficulties in cutting the budget during busts or from countries' tendency to over-borrow during commodity price booms (Dabán and Jean-Luc Héris, 2009). This is aggravated by the general tendency to neglect levying and collecting taxes.

Ian and Karl (2003) found that in Equatorial Guinea government revenues from oil went from \$3 million in 1993 to \$725 million in 2003; and the oil sector's share of GDP increased from 11 percent to 86 percent in 2000. Such high dependence on the export of oil coupled with poor budgetary management of the windfalls from the oil sector boom has led the country to sustain a negative budget balance, even at times of oil price bust. A study by Obinyeluaku and Viegi (2007) on Nigeria, a heavily dependent economy on oil revenue to finance over 80 per cent of its total expenditure, has found poor oil revenue management of the government making its budget vulnerable to fiscal shocks. This poses a serious threat both to the sustainability of the country's budget and to its macroeconomic stability. According to Obinyeluaku and Viegi (2007), oil windfall induced Nigeria's government spending that is difficult to retrench when the oil revenue falls, distorting government budget allocation pattern, and increasing deficits and debt stock (Obinyeluaku and Viegi, 2007).

On the other hand, Aydın's (2010) study on South Africa showed that South Africa's revenue performance was outstanding during the mid-2000s, and the recent decline in revenue was one of the least among the emerging and advanced markets. Results on the elasticity of tax revenue showed that South Africa's elasticity is higher during business upturns, indicating good prospect for recovering the revenue lost during the global financial crisis—all attributed to a careful public revenue-expenditure policy management.

Coming to issue of *public spending*, the government revenue problem that is related to the commodity boom and noted above has a direct implications for government expenditure/public spending. A study by Hawthorne *et al.*, (2005) noted that, resource boom may lead governments to engage in overspending that may eventually need to be financed by debt. Following booms governments may undertake costly projects that they may not be able to sustain once the boom is reversed. This 'inter-temporal allocation' choice problem is extended to the public if government restricts its public from investing their wealth in foreign assets (Deaton, 1999,). This issue is also investigated, according to Neumayer (2004), by Rodríguez and Sachs, who employed a Ramsey growth model to the workings of the Venezuelan economy. They noted that economies rich in natural resources are likely to live beyond their means and engage in inefficient spending.

Ian and Karl (2003) has documented in their Equatorial Guinea study that during high oil price periods, the country's governments often implement ambitious public expenditures, but often find their budgets cannot maintain that level of spending during low price periods. As a result, the government often borrow money at unfavorable terms not only during bust cycles, but also during booms by a pledge of future oil production as collateral to secure additional loans (Ian and Karl, 2003). Budina, *et al's* (2007) econometric study on Nigeria has also noted that the reason for failure of Nigeria's oil boom to end the perennial stagnation in the non-oil economy is mainly due to the extreme volatility of expenditure rather than Dutch Disease effects. As noted by Budina, *et al* (2007), fiscal policies failed to smooth highly volatile oil revenue. As a result, and surprisingly, government expenditure was more volatile than oil income. The authors provide econometric evidence showing that volatility of expenditure was increased by debt overhang problems (Budina, et al, 2007).

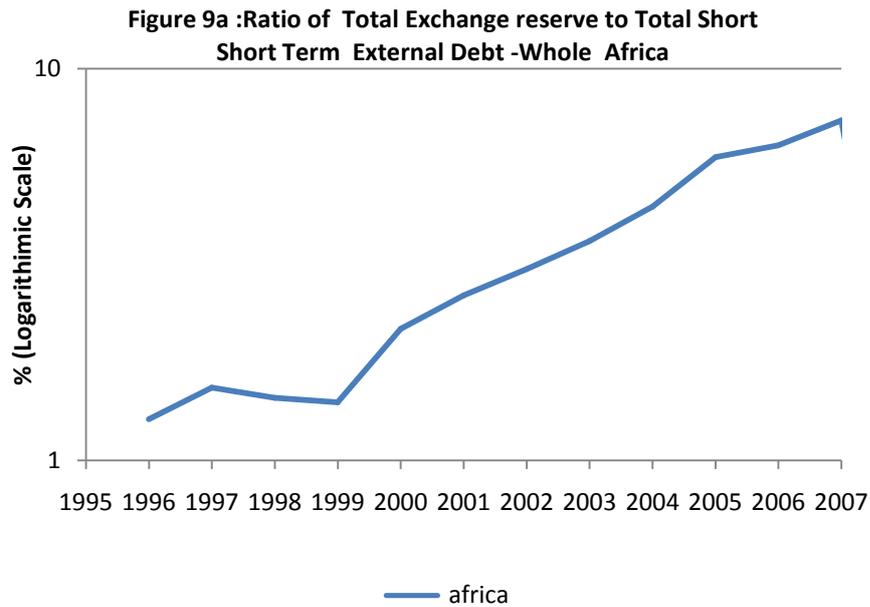
In a similar vein, IMF (2012) noted that, the excessive volatility of commodity prices complicates fiscal policy in both commodity-exporting and -importing countries because adjusting fiscal expenditures to changes in external environment usually faces significant time lags. IMF (2012) further noted that, this applies in particular for countries in which the size of fiscal revenues is highly dependent on the level of commodity prices. A recent study by Medina (2010) used vector autoregressive modeling technique to analyze the effects of commodity price fluctuations on fiscal revenues and expenditures for 8 commodity exporting developing Latin American countries. Medina (2010) has indicated that, the recent boom and bust in commodity prices has led countries fiscal positions generally to react strongly to commodity prices shocks, yet there are marked differences across countries in observed reactions. Fiscal variables in Venezuela display the highest sensitivity to commodity price shocks, with expenditures reacting significantly more than revenues. On the other side of the spectrum, Chile's fiscal indicators react very little. A plausible explanation to this distinct behavior across countries could be related to the efficient application of fiscal rules, accompanied by strong institutions, political commitment and high standards of transparency

(Medina, 2010). Finally, Atkinson and Hamilton (2003) showed that resource-rich countries whose governments engaged in high consumption spending, have on average, experienced lower economic growth. They showed that governments that engaged in excessive current consumption faced significantly worse in terms of economic growth than those that used the windfall to finance public investment (Atkinson and Hamilton, 2003).

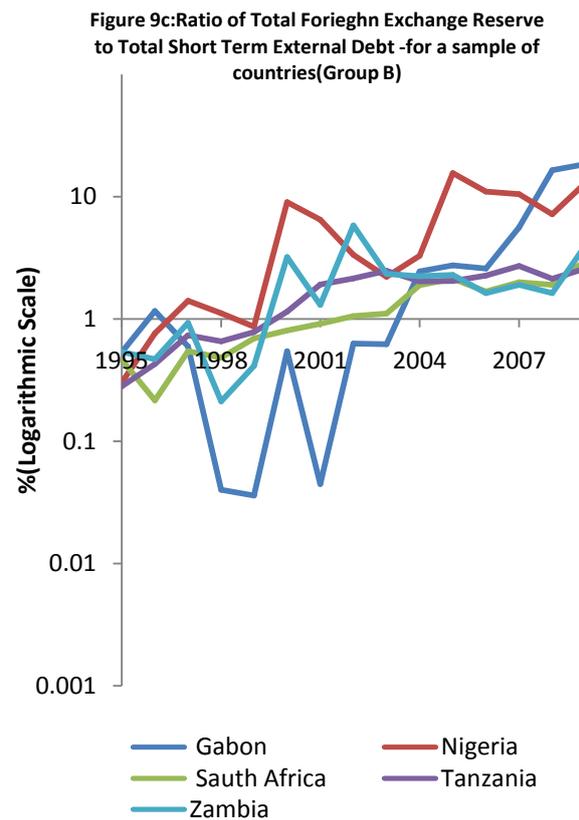
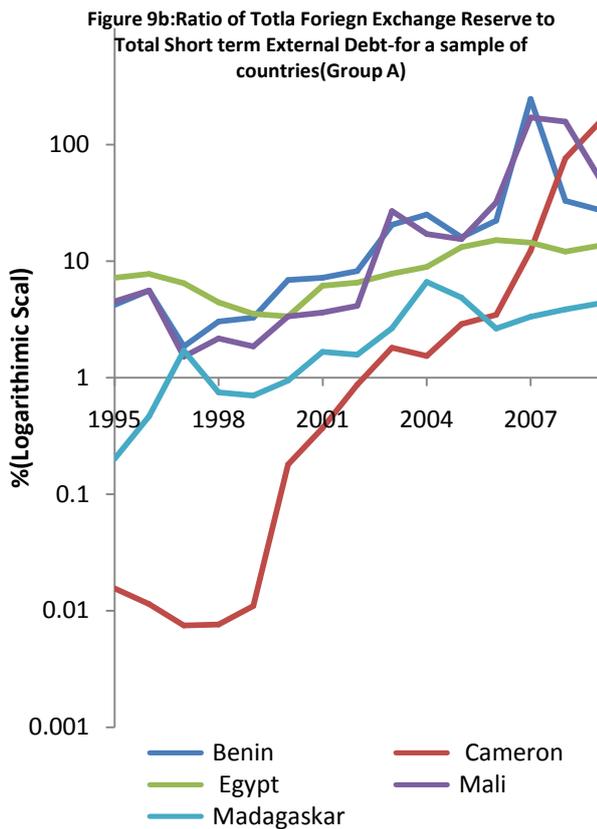
The third and final important issue in fiscal response relates to *the issue of saving and indebtedness*. As noted by Collier and Gunning (1999) and Medina (2010), different commodity export dependent developing countries have responded differently in their revenue management policies at times of commodity price boom. Some countries raised significantly their effective tax rate (Kenya, Bolivia), while others kept it unchanged (Colombia, Botswana) or decreased it (Cameroon, Senegal) during price spikes. In relation to this, IMF's (2009) study showed that, Mexico's policy of borrowing against future oil earnings during its small oil windfall in 1979-81 triggered a spiraling growth in spending. Angola's practices of mortgaging future oil earnings to increase public outlays have repeatedly led to eventual budget and debt crisis. During the oil boom of the 1970s, Nigeria borrowed very heavily to finance public consumption and in the mid-1980s suffered two shocks: a reduction in the oil price from US\$30 to US\$18 per barrel and a swing from borrowing to repaying (IMF, 2009). To avoid such vulnerability to fiscal problems and indebtedness, according World Bank (2012), saving up during good times for use in bad times through countercyclical budgetary policies might be useful. Thus, handling the revenue and spending problem associated with a booming sector through optimal savings is imperative.

Related to this, as has been noted in Geda (2002, 2003) for Africa and Brahmhat *et al* (2010) for developing countries, high commodity prices in the 1970s encouraged many resource-abundant countries to use their resources as collateral to borrow abroad to finance large investment projects and high public expenditure. When prices plunged in the 1980s, these countries were left with balance-of-payments crises and unsustainable external debt levels. A recent paper by Reinhart and Rogoff (2010), cited in Brahmhat *et al* (2010), suggests that when external debt rises above 60 percent of GDP, annual growth declines on average by 2 percent; and for high levels of debt, growth is cut in half. This is a worrisome signal for resource rich African countries who are indulging in indebtedness following a commodity boom.

Another debt related fiscal problem is a possible rise in the level of short term debt following a commodity boom. Short term debts are particularly important because if the level of such debt is way above the official reserve (or any liquid asset held outside) it may make countries vulnerable to speculative attack. Thus, the ratio of official reserve (liquid asset held outside) to short term debt - called the "Guidotti-Greenspan" indicator - shows the vulnerability (if below 1) or otherwise (if above 1) of countries to speculative attack (see Avendaño *et al* 2008). A figure above one in this indicator is good because it can be interpreted as a step toward lowered exposure to a speculative currency attack by foreign and domestic investors, as debt easily repaid is less than the reserves needed to defend the exchange rate (Avendaño *et al* 2008). Figure 9a shows an improvement in the Guidotti-Greenspan indicator for all African economies (1995-2007) in aggregate terms while Figures 9b&c shows the same for a sample of countries. As noted by Avendaño *et al* (2008), changes in debt composition, maturities and structure have contributed importantly to these improved performance.



Source: Authors Computation using ADI-2011 data



Source: Authors Computation using ADI-2011 data

Summarizing the issue of saving, econometric studies show a positive relationship between saving and the degree to which rents from resources are being invested to create growth in GDP (Atkinson and Hamilton, 2003). Specifically, Atkinson and Hamilton (2003) found that a 10 percent increase in genuine saving ratio leads to a 0.3 percent increase in the growth rate of

GPD per capita. Given this, policy should aim at structuring transparent mechanisms or funds in which the nation's wealth from natural resources can be saved. Suggestions by Auty (2001) following his comparative study of Botswana's success (and Saudi Arabia's failure) in curbing the effects of the commodity price boom include setting up capital development fund (as a means to identify the capital component of the rents and sterilize the capital inflows); revenue stabilization fund (to buffer the revenue that are absorbed via public expenditure from price shocks); and project evaluation units to improve the efficiency of public sector investment (Auty, 2001).

Finally, the political economy of fiscal policy is also important in the wake of resource flows from the booming sector. Reviewing the experiences of 18 developing countries that experienced favorable terms of trade shocks during 1974 to 1989, Little *et al* (1993) shows that these countries did not grow more than countries that experienced negative terms of trade shocks during the same period. In addition to the loss of competitiveness in non-booming industrial and agricultural sectors (Dutch disease), the poor management of windfall revenues from the commodity booms (the fiscal response) were cited as the major causes for this poor performance (Little *et al*, 1993). Resource-rich nations may also be more vulnerable to corrupt rent-seeking behaviour that serves to distort allocation of resources and hamper growth (Bardhan, 1997- cited in Gylfason, 2000). This, fueled with lack of transparency on how the wealth is distributed, makes it very difficult for governments to alter the spending habits when a downturn in resource prices globally arrives (Auty, 2001). Moore (2004) noted that an excessive reliance on resource revenues could have the risk of transforming resource-producing countries into renter states, a case that explained poor economic performance of Nigeria. The theory of renter states holds that countries that receive substantial amounts of resource revenues on a regular basis tend to become unaccountable to their citizens and less prone to promote political competition and representation (see Moore, 2004). This situation could encourage the governments of resource-producing countries to devote more attention to distributive functions (e.g., subsidies) and interventionist functions (e.g., creation of a national resource company) than to functions related to the regulation, supervision, taxation, and management of the economy (see Moore, 2004).

Cárdenas and *et al*'s (2011) empirical study has shown that, higher commodity dependence reduces the government's incentive to invest in fiscal capacity. Also, fiscal capacity is found to improve less over time in commodity dependent countries relative to countries where commodity exports play a less relevant role. Ramírez *et al* (2011) also found that higher natural resource rents decrease the incentive of the government to invest in fiscal capacity.

A number of important conclusions may be drawn from the above analysis. Capital inflows from a booming sector may have an inherent tendency to aggravate the deficit by encouraging spending and discouraging tax collection. In the process they may result in governments drifting away from sustainable self-financing behaviour and indulge in indebtedness. A further important implication of the analysis relates to the impact of such capital inflows on the distribution of income. By ensuring a reduction in some kind of taxes such as in direct taxes (as opposed to indirect taxes which usually are levied on ordinary consumer items), as well as the creation of renter states such capital flows could influence the distribution of income in favour of a particular group. Moreover, the literature on development has intensively documented that commodity booms and busts are often badly handled and discouraged creating fiscal capacity

(see Gelb et al., 1988; Bevan et al., 1989, 1993 for an older review; Ramírez et al 2011). The general conclusion is that the adverse consequences of a resource boom are mainly a result of poor management of windfall revenues or poor fiscal response: the unwise use of large windfall revenues (in terms of high spending, less saving and indebtedness and corruption) contributes to economic degeneration. Thus, addressing these issues are macroeconomic policy challenges in countries with a booming commodity sector.

IV. Dependence on Commodities and Long-term Growth Strategy Issues

We have discussed the macroeconomic effect of a booming sector and its potential de-industrialization effect in the previous section. That section raised the issue of real exchange rate appreciation following of a booming commodity trade and the resulting competitive threat to the tradable sector which may lead to de-industrialization. In this section we will highlight more on the long term growth and developmental effects of such dependence on primary commodity trade. Although the macroeconomic implication of this is not directly apparent, given the focus of this study, understanding the nature and potential impact of commodity dependency have an implication for macro policy too (ie., getting out of this dependence needs particular set of macro policies such as, at times, getting prices 'wrong' (see Amsden 2001; Akuyz *et al* 1998; Geda 2006)). We will begin this section, however, first by highlighting the positive effect of increased earnings from a booming primary commodity sector in Africa which is propelled by the growth surge in emerging economies of China, India, Brazil, among others.

4.1 Positive Effects: Terms of Trade Improvement and Financing Development

As the evidence presented in Figure 12 below shows the recent surge in price of primary commodities is bringing terms of trade improvement for African countries. This in turn is leading to a rise in export earnings (see Figures 4 and 5). Thus, on the positive side, the external flows from the booming primary commodity export sectors in Africa are bringing much needed resources that could be used for growth and poverty reduction. Indeed, one of the most important positive effects of such inflows in relation to Africa stems from the possibility that they offer, in addition to offering additional resource, to tackle the foreign exchange problem (or import constraint) which these countries encounter under normal circumstances. This additional resources could be used (a) directly by the public sector for creating an enabling environment for growth such as the provision of infrastructure and social capital (health, education etc) and (c) indirectly by the private sector (through credit and foreign exchange availability).

A recent econometric evidence using a model of private investment for Africa shows a number results that confirms this possibility (see Geda, 2012b). First, the study shows that private investment in Africa is foreign exchange constrained and hence a positive balance of payment position is found to have strong positive effect on private domestic investment. The same study also shows the crowding-in effect of public investment in many parts of the continent, in particular in relatively less developed regions. Since resources flows from export of natural resources improve the balance of payment position of countries and also provide the resources need for public investment (such as infrastructure) they do have positive effect on private investment and growth. In fact, as the discussion in section one and Figure 4 in that section shows there is a strong association between the excellent growth performance of African

countries and the price of their export commodities. Collier and Goderis (2012) using a VAR model examined this issues for the period 1963–2008. They found that commodity price booms do have positive short-term impacts on growth, but that the impacts are significantly negative in the long term. However, these negative long-term effects exist only for natural resources like oil and minerals, and only in countries with bad governance. In fact, in another empirical study Mehlum *et al* (2006) find that the negative impact of natural resources on growth steadily falls as institutional quality increases. When institutional quality is sufficiently high, the natural resource effect becomes positive (cited in Brahmhatt et al, 2010).

From another but related perspective, the surge in demand for primary commodities, which is primarily triggered by the demand from emerging Southern economies in recent years, is creating an opportunity for an economic engagement with such economies. An excellent illustration of this is what is called the "Angola model" of Chinese engagement with primary commodity producers. In the so called "Angola model" today's provision of finance and infrastructure is committed against a commitment to export primary commodity to China in future. In addition, resource seeking foreign direct investment from such emerging economies are also flowing to primary commodity producing African countries (see Geda 2008; 2012b).

Thus, emerging economies driven by the desire to secure natural resource are also building infrastructure and hence their complementary impact (World Bank, 2004; Geda 2008; 2012b). Compared to FDI from the traditional partners, FDI from emerging economies are found to be resilient as can be inferred from the trend of such flows following the 2008/9 global economic crisis (see Geda 2012b). Moreover, as UNCTAD (2010) noted Transnational corporations (TNCs) from emerging economies have a tendency to invest in labour-intensive manufacturing and their FDI has a large potential for employment generation. In addition, during the period 2003–2005 developing country investors doubled their employment in Africa (UNIDO, 2007 cited in UNCTAD, WIR, 2010). Technologies used and secured by TNCs from developing countries are likely to be suitable for other developing countries and may therefore contribute to technological upgrading in Africa too (Broadman,2007 cited in UNCTAD, WIR, 2010). In addition, emerging South economies are increasingly providing essential inputs (and components) to Africa's growing manufacturing sector, most notably, its textile and apparel sectors (World Bank, 2004; Geda 2008). Thus, notwithstanding its potential detrimental effects (see below), if wisely used, the recent economic engagement of Africa with the BRICS, the growth of finance and investment flows from these economies, which is primarily driven by the desire to secure natural (especially energy) resources, could bring growth and development in the continent (see Geda 2008; 2012b).

4.2 Adverse Effects: The Risks of Commodity Dependence & De-Industrialization

The very fact that growth in the last decade is largely due to improvement in the price of primary commodities, as we noted in section one above, does also shows the vulnerability of Africa's growth to what happens in the global commodity market, in particulate to the price of commodities and its volatility.

From the standard trade theory perspective, Africa's specialization in primary commodity is justified for it is in its comparative advantage (Smith, 1776; Ricardo, 1817; Hecksher 1918; Ohlin 1931; see Geda 2012). This received classical 'wisdom' has not changed either following the importance of technology in explaining world trade patterns by late 1950s and 1960s (See Posner 1961; Hufbauer 1966 and Vernon 1966) or that of the 'New Trade theories' since the late

1970s/early 1980s to date (see Krugman, 1979; 1979b, 1980, 1981; Dixit and Norman 1980; Lancaster 1980; Helpman 1981; Ethier 1982; Lall 1973; and Helleiner 1981; Stewart 1984, see Geda 2012a). Primary commodity trade is, however, Africa's development problem. This implies that a search is needed for other systemic explanations, which might help to explain trade in primary commodities and its developmental implications.

A critical (non-orthodox) school has provided an alternative analysis about the gains from trade focusing on trade in primary commodities. This has taken concrete form in the works of the 'structuralist' economists of the Economic Commission for Latin American and the Caribbean, ECLAC (Prebisch 1950, reprinted 1962 and Singer 1950)¹⁶. Having highlighted the enclave nature of export sectors in South, and the role of industry within a protected domestic market as a dynamic force for growth, Singer goes on to argue against specialization in the export of primary commodities. The main reasons forwarded for this are twofold. Firstly, that it removes the secondary and cumulative effects of investment, since such investment usually comes in the form of foreign capital, which is not reinvested. And, secondly, that it diverts investment in developing countries to areas where the scope for technical progress is limited and worsening terms of trade prevail (Singer, 1950: 477).

For Singer and Prebisch, the root cause of the terms of trade deterioration is the fact that the increase in productivity of manufactures in the North raises the income of producers, as opposed to lowering prices, which would have benefited consumers. On the other hand, productivity improvements in primary commodity production benefits consumers through lower prices. Thus, developed countries benefit, both as consequence of higher income and lower prices, while no such benefits are reaped by the developing countries trading with them. The latter, in Kaleckian/Hicksian terms, essentially points that the North sells manufacture goods to the South in an oligopolistic fix-price market, while the South operates within a flexi-price (primary commodity) market. This results in a logical asymmetry of terms of trade in favour of the former. (See Spraos, 1983, for a critical review of this.). Moreover, the low demand elasticity for primary commodities such as food, and negative impact of technical progress on raw material demand further aggravates the problem (Singer 1950: 478-479; Prebisch, 1962: 4-6; Geda 2012a).

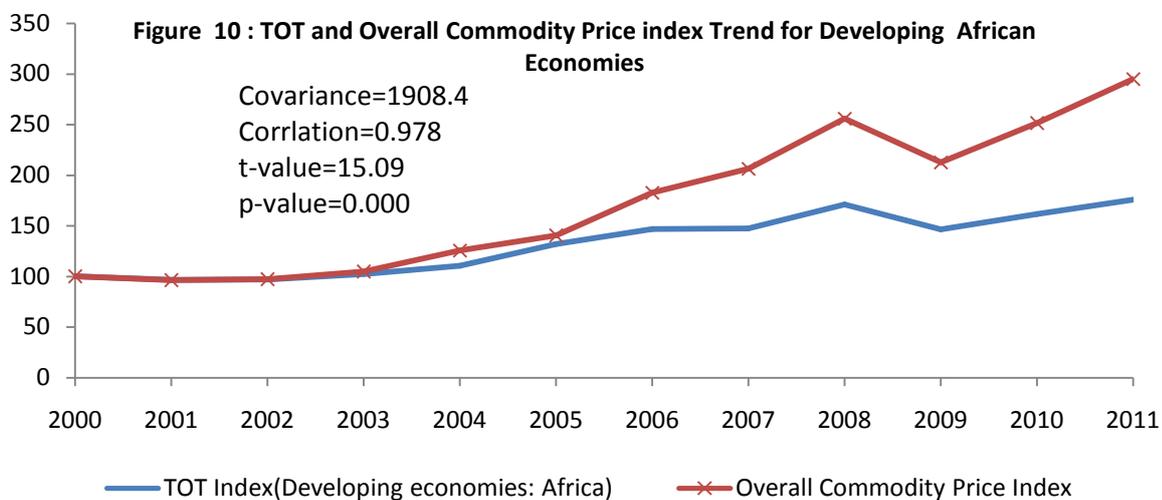
In addition to the above elasticity argument, Singer and Prebisch have also emphasized the adverse impact of cyclical commodity prices which is related to business cycles in the North. From this school also comes the hypothesis of a secular deterioration in the terms of trade of primary commodities vis-à-vis manufactured goods, termed the *Prebisch-Singer hypothesis*¹⁷, that generated a number of empirical studies which generally confirmed its validity (see. Sarkar 1986; Grilli and Yang, 1988; Cuddington and Urzua 1989; Cuddington 1992; Ardeni and Wright 1992; Helg 1990; Sarkar 1992; Sapsford and Balasubramanyam 1994 and Hadri 2012). Singer argues that the developing countries could face a dilemma in that they could fail 'to industrialize in boom because things are as good as they are, and [they fail] to industrialize in a slump because things are as bad as they are' (Singer, 1950: 482). (see Geda, 2012a for detail).

¹⁶ The Ethiopian economist Gebrhiwot (1917) has already discovered the terms of trade deterioration and its adverse implications for developing countries more than three decades before Prebisch and Singer (see Geda, 2012a).

¹⁷ Unlike the classical economists, and even Keynes (1912, cited in Thirlwall 1991), who believed in diminishing return and hence an improvement in terms of trade to primary commodity producers, it was Kindleberger who first noted a secular decline in the terms of trade of primary commodity producers [in the West; see previous footnote]. (Kindleberger, 1943 cited in Thirlwall 1991; see also Sarkar, 1986 and Thirlwall, 1991 for details.)

In line with this received wisdom, Kaplensky (2008) has noted that the improvement for primary commodities price fueled by emerging economies is also at the same time leading to fall in manufacturing prices at the end of the 1990s, showing an improvement in terms of trade for African commodity exporters. This may lead to the temptation of advising against industrialization in Africa. However, most African export commodities (point commodities) are skill and capital intensive (relative to manufacturing). In addition only five countries account for 90 percent of all fuel exports, and 12 countries for 90 percent of all metals and minerals exports. Thus, the country-distribution of the benefits, argues Kaplensky (2008), from the commodity boom is likely to be limited in nature. Thus, observed from political economy, sustainability of growth (including environmental), employment and related perspective, the aspiration and justification for industrialization is still valid, in spite of the tempting improvement of the terms of trade by moving against manufacturing. (See Kaplensky 2008).

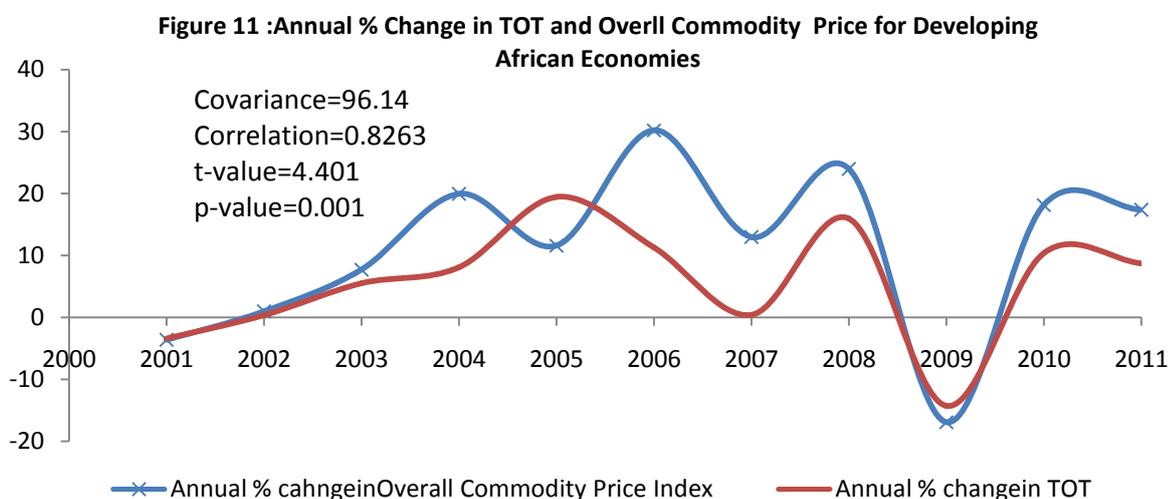
In general for African economies, recent data shows a high and significant degree of correlation between overall terms of Trade (TOT) and the aggregate price of commodity in the last decade. Both are also characterized by huge volatility (See Figures 10 and 11). Figure 10, shows that commodity prices and the TOT for commodity-dependent nations of the continent had been either stagnant at a certain low level or deteriorating until 2003 (See also WB: 2007). Following the commodity price boom in 2003, TOT for developing African economies has recorded a steady upward trend until the last quarter of 2008 when it began to decline following the global economic crises (IMF,2012). A global demand boom (primarily driven by emerging economies) and the beginning of recovery in the global economy since 2009, once again made commodity prices and TOT of Africa to register a rising trend.



Source: Author's Computation using UNCTAD, 2012 Data base

Though it is difficult to infer at this stage about causality between the ToT and Commodity prices of Africa without a rigorous empirical work, one can see the strong association of commodity prices and TOT for the commodity export dependent developing African economies from Figures 10 and 11 (with correlation coefficient of 0.98 for the levels of these two variables and 0.83 for their growth rates). As noted in Davis and Tilton (2005:235), IMF (2005,2006), Poelhekke & van der Ploeg 2007, World Bank (2009), Bornhorst et al., 2009), apart from secular TOT

deterioration, short term volatility/instabilities of commodity prices have serious negative macroeconomic ramifications for commodity export dependent economies.



Source: Author's Computation using UNCTAD, 2012 Data base

The rise and volatility of commodity prices during the past decade have been attributed to a number of factors. Business cycles in major industrial countries and rapidly rising demand in emerging economies (the BRICs) have been the main factors (IMF, 2010 and 2012; World Bank, 2009). The literature suggests that global supply shocks typically do not have a significant long-run impact on most commodity prices, although they may increase volatility. On the other hand, global demand shocks have persistent effects on prices (IMF, 2012). Moreover, fluctuations in exchange rates of key currencies, especially between the U.S. dollar and the euro, affect price volatility (World Bank; 2009; IMF, 2012; UNCTAD, 2011 & 2012). Finally, some have argued that the frequency and the magnitude of price swings have become more decoupled from market fundamentals in the short run because of the rapid development of commodities as an asset class, but the jury is still out on this issue (ECA, 2012). This is a likely scenario as can be read from Geda (2002) who has shown that the global financial market does affect African economies not directly in finance but through its indirect effect on demand for commodities which could be held as an alternative portfolio by global investors/speculators.

In sum, owing to primary commodity dependence most African countries are vulnerable to volatility of commodity prices¹⁸. The literature suggests that this is bad for growth. Ramey and Ramey (1995), Deaton (1999), and Deaton & Miller (1996) were among the first to find evidence that countries with higher volatility had lower mean growth. Their results have since been confirmed by a number of researchers who provided detailed evidence (See Acemoglu et al., 2003; Hnatkovska & Loayza, 2005; Fata & Mihov, 2006; Loayza et al., 2007). In a detailed analysis of more than sixty countries between 1970 and 2003, Poelhekke and van der Ploeg (2007) find

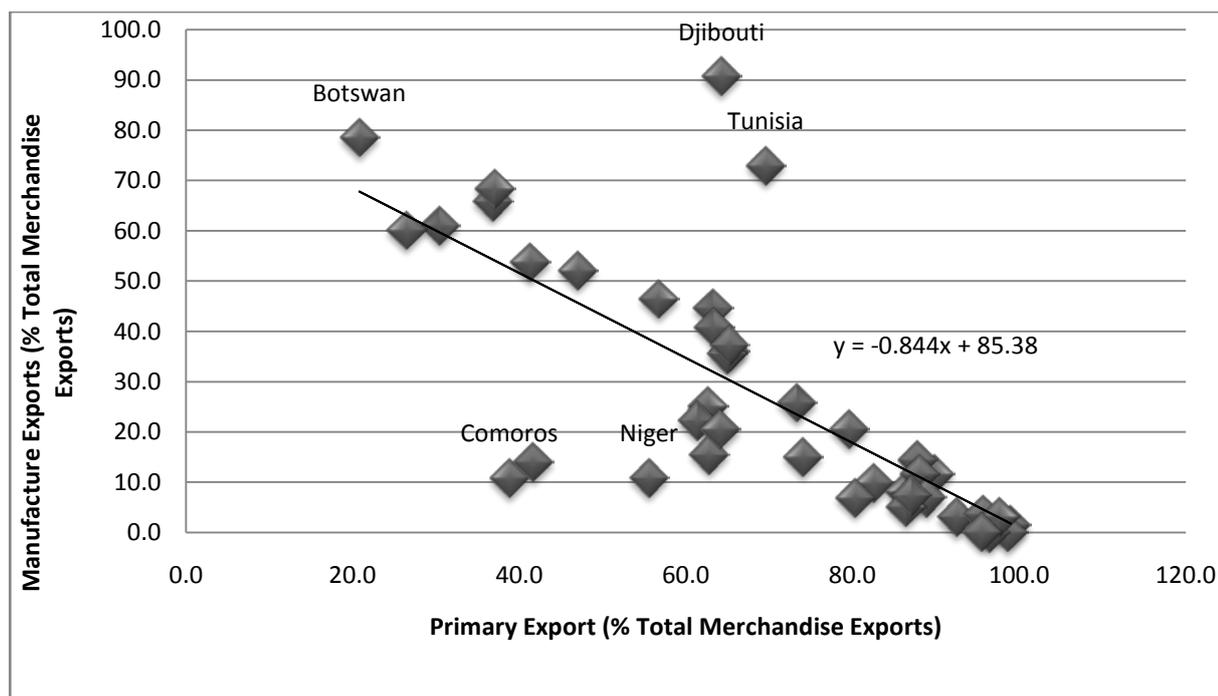
¹⁸ In addition to the empirical literature about the Prebisch-Singer hypothesis noted above, UNCTAD (2008) provides graphical evidence of higher price volatility for nonfuel commodities and petroleum than for manufactures between 1970 and 2008. Mintz (1967), more than forty years ago has also documented lower U.S. export price volatility for finished manufactures than for semi manufactures, crude materials, or food between 1880 and 1963.

strong evidence that the influence of volatility is far greater in the poor than rich countries. They also noted, while capricious policy and political violence can add to volatility in poor countries, extremely volatile commodity prices “are the main reason why natural resources export revenues are so volatile” (Poelhekke & van der Ploeg 2007: 3), and this in turn leads to volatility of growth of these economies.¹⁹ This strong relationship can also be read from Figure 5 in section one above. Similarly, a recent study by Ocran and Biekpe (2008), using Fixed effects panel data estimator and data for Sub-Saharan African countries found a negative relationship between instability in export earnings and economic growth. The results also indicate that the level of commodity dependence matter in determining economic growth in the region. Thus, continued dependence on a narrow range of primary commodities is a matter of great concern for sustainability of growth in Africa.

The dependence on primary commodities may also lead to de-industrialization as predicted by the ECLA economists as well as the Dutch disease literature. Figure 12 shows the recent evidence for 41 African countries. From Figure 12 we can read a strong negative association between dependence on resource exports and manufacture exports (except in small economies such as Djibouti and relatively developed economies such as Tunisia) - perhaps an indication of a trend of de-industrialization. The adverse effect of this can be inferred from Leamer's analysis who pointed out four problems connected to such a resource boom (see Leamer *et al.*, 1999, and Alvarez and Fuentes, 2006 both cited in Avendaño et al 2008). First, the absorption of low-skilled labour in manufacturing is foregone; hence, inequality is deepened. Second, those manufacturing activities that do emerge are capital and skill intensive. Third, human capital accumulation may be impeded, as skills in the resource sector are very specific and spillover effects limited. Fourth, volatility in the prices of commodities may raise capital risk in resource-dependent, undiversified countries, which might deter investment and other tradable activities to emerge (Avendaño et al 2008: 15).

Figure 12: Primary Commodity and Manufacture Exports (41 African Countries 2005-2009 Average)

¹⁹ There are many reasons that poor countries face higher volatility and that higher volatility costs them so much more in diminished growth rates. Aghion et al (2005, 2006) noted macroeconomic volatility driven by either nominal exchange rate or commodity price movements will depress growth in poor economies with weak financial institutions and rigid nominal wages, both of which characterized all poor economies in the past even more than today. See also Aizenman and Marion (1999), Flug, Spilimbergo, and Wachtenheim (1999), Elbers, Gunning, and Kinsey (2007), and Koren and Tenreyro (2007).



Source: Authors Computation based on ADI 2011 data

One way out of this problems is diversification of exports. Unfortunately dependence on export of primary commodities is also strongly associated with low level of diversification in Africa (ECA, 2007). In a comprehensive study, to which the 2007 African Economic Report of the ECA is devoted, ECA researchers found that the level of diversification in Africa is very little in the last 25 years by any measures and accounts. Whenever there is some effort at diversification it is volatile and the gains are fragile. Windfall gains from oil exports, especially in west Africa led countries to pursue a more concentrated path of commodity dependence instead of using oil revenue to diversify their exports (See ECA, 2007: 116-117). Similar, focusing on the effect of the fast growth of emerging economies (the BRICS) and their effect on surging commodity demand for Africa, Geda *et al* (2012) noted that this is having the effect of locking African countries in primary commodity production and exports. The effect of this in the future could be very big since Africa exploited only a very small (about 13% in case of China) potential of its trade with emerging economies. The study also showed that while China's commodity demand boom is significantly locking African commodity producers in the production and export of traditional commodities, India's effect on such pattern is minimal. The study also revealed that the indirect impact of China's commodity demand surge on African export structure is more important than its direct impact. That is, the impact of China's commodity demand growth surge on the export structure of Africa is significantly felt through its effect on world commodity prices. Finally, this study showed that the intensity of the impacts of China's commodity import surge on the export structure of Africa varies across different commodity groups with the impacts being sizeable in fuel and mineral export sectors (see Geda *et al*, 2012).

ECA (2007), as we noted above, suggested diversification as the way out of this quagmire. The ECA study noted that increasing investment and focusing on its sectoral allocation is crucial for diversification. Governments in Africa need to design incentive mechanisms, create an enabling environment (as has been done in Kenya, Tunisia) that includes avoiding unguarded

liberalization, encouraging private investment in new area, and ensuring African firms are integrating themselves in the global value chain. For this, public investment in infrastructure need to be given priority. The ECA study also avoiding inflation and having optimal level of exchange rate (stable macroeconomic environment) is found to be important determinants of diversification in Africa. In addition, a pro-active fiscal policy with prudent financing, good governance (quality of institutions). are also found to be important (see ECA, 2007:136-139). Finally, the ECA study noted that growth in Africa in its study is largely due to factor accumulation; and that the contribution of total factor productivity (TFP) -technology- is negative. Diversification, by changing this TFP to positive values, could be an important policy handle to spur growth and its sustainability in Africa.

V. Conclusion: Implications for Macro Policy and Capacity Building

In this study, an attempt to examine the macroeconomic ramification of resource flows from the recently booming natural resource (commodity) sector in Africa is made. Although such flows have propelled the excellent growth recorded in the continent in the last decade, to get the most out of them requires careful macroeconomic management of the challenge they pose in the short run and strategic thinking to abate their potential adverse effect in the long run. Both action require capacity (and/or capacity building) in economic governance. In this conclusion section of the study we will highlight first the implications of resource flows from a booming natural resource sector for *macroeconomic policy* which will be followed by the implications for *long term strategic policy direction*. The section concluded by point out the capacity building implications.

Macroeconomic Policy Implications: in terms of macro policy a combined and well articulated *fiscal, monetary and exchange rate policy* is required to address the macroeconomic challenges of resource flows from the booming sector. In this regard, first in terms of *fiscal policy* there is a need to have an optimal level of public spending and saving. Saving the revenue from the booming sector and reducing spending is helpful because the African evidence shows that the spending effect is one of the main transmission channels thorough which the traditional export sector could be adversely affected. In addition, smoothing spending over time is helpful to reduce volatility that we observed in African commodity prices and the related export earning and public revenue volatility. Thus, as has been pointed out by Brahmhat *et al* (2010) introduction of fiscal rules that determine how much of the resource revenues to be spent and saved is important. In addition, the quality of this spending could be improved by directing it to tradables areas (including imports) and areas that enhance productivity in non-tradable sectors as well as in areas that facilitate structural transformation in the long run. This could be done through the use of a medium-term expenditure framework (see Davis, Ossowski, and Fedilino; Brahmhat *et al* 2010) which avoids the pitfalls of year to year planning.

With regard to government tax revenue, the literature generally shows that government's tax revenue declines following revenue from the booming sector, even if the government is passing the windfall to private economic agents. This is because the revenue from the booming sectors discourage tax levying and collection because the former is a less costly way of getting revenue and hence governments make less effort compared to the pre-boom

periods. Moreover, tax collection generally have a political implication and governments do avoid them when the opportunity exists. However, the evidence on this is mixed. The evidence however shows that generally government revenues are found to be volatile and the vulnerability to indebtedness is strong. Awareness about the eventuality of this and attempt to deal with them through optimal saving and sensible fiscal rule could help policy makers avoid such concerns. As Auty(2001) advised , setting up capital development fund (as a means to identify the capital component of the rents and sterilize the capital inflows); revenue stabilization fund (to buffer the revenue that are absorbed via public expenditure from price shocks); and project evaluation units to improve the efficiency of public sector investment are important areas to consider.

In terms of *monetary and exchange rate policy*, the fiscal policy direction noted above need to be combined with an exchange rate and monetary policy that would avoid the possibility of real exchange rate appreciation. An important instrument in this regard is inflation targeting. This, in turn requires a tight monetary policy which is combined with a floating (or managed floating) exchange rate regime. In sum, as noted by Elbadawi and Kaltani (2007), successful booming sector-driven economic transformation requires macroeconomic and financial frameworks for promoting national savings (high and prudently invested savings), fiscal stability (effective counter-cyclical policy) , diversification (plan for stemming real exchange rate appreciations, including measures to enhance the productivity of the non-booming tradable sector). and a political and social contract for managing booming sector revenues, based on democratic participation and transparent economic governance.

In this regard, it is imperative to learn from African success stories such as Botswana. A number of studies ascribes Botswana's success to prudent fiscal and macroeconomic policies (See *inter alia*, Rodrik 1997; Harvey and Lewis 1990, cited in Freeman and Lindauer 1999; Geda 2006)). As Siphambe (2007) noted, Botswana's high growth has reflected good governance (including democracy, political stability and low corruption), prudent financial management (including prudent planning and forecasting of diamond prices), and macroeconomic stability. It also held successful initial negotiations with its diamond company, resulting in high levels of royalties. The government avoided 'Dutch-Disease' by not engaging in excessive spending of the export windfalls, which would have hurt both agricultural and non-mining industrial growth (Roderick, 1997). Botswana also created a Revenue Stabilization Fund, treated the boom as temporary, had legally enforceable maximum expenditure limits, and invested diamond revenues predominantly into infrastructure, education and health (Sipambe, 2007). The government allocated resources based on economic and social returns, and was successful with foreign investors. The dividends of this good governance in macroeconomic management have spilled over to other sectors as well (Rodrick 1997; Harvey and Lewis 1990, cited in Freeman and Lindauer 1999). Nevertheless, Siphambe (2007) noted that, the country has seen little diversification into manufactures, and a continuing high level of unemployment and poverty for most of the population. Thus, Botswana was able only to minimize but not escape the resource curse as noted by Siphambe (2007). From this we may conclude that prudent macro management is a necessary but not sufficient condition to make the best out of a booming natural resource sector and hence the need to have long term strategic policy direction is crucial.

Long term strategic policy direction: this study has also shown that the dependence on primary commodity production and export (whose prices are deteriorating over time and are cyclical in the short run) that follows a booming natural resource sector has detrimental implications for long-run growth and industrialization aspiration of African countries. Thus, the majority of countries in the continent are characterized by lack of diversification owing to deficiency in human and physical capital and appropriate policy. The ECA (2007) diversification study recommended an increase investment with appropriate sectoral allocation for diversification. The study also noted the need to design incentive mechanisms, create an enabling environment (such as provision of infrastructure with stable macroeconomic environment) to diversify the African economy.

It is imperative to learn from the experience of both African and Asian economies who managed to diversify their economy in the last four decades. As has been noted by Amsden (2001), the state in the East Asia was crucial for its industrialization and export expansion. The state set four functions for itself: (i) development banking and efficient bureaucracy, (ii) local-content management, (iii) selective seclusion (opening some markets for foreign transactions and closing others), and (iv) national firms formation that includes the emergence of a managerial class and cadre of entrepreneurs. Two principles guided this effort: (a) to make manufacturing profitable enough to attract private entrepreneurs, and (b) induce enterprise to be result-oriented and to redistribute their monopoly profit to the population at large (Amsden, 2001: 125). Similarly, judicious targeting and organization to ensure the efficacy of public policy to encourage primary product diversification and process, exportation and domestic capacity creation (through training, infrastructure provision including research, subsidies, credit provision, etc) was made by governments of Southeast Asian countries who were commodity dependent (Jomo and Rock, 2003; see Geda, 2006). Africans need to move along similarly lines by tailoring the lesson to their condition and the prevailing global environment. This is important if they need to avoid the de-industrialization impact of resource flows from the booming primary commodity sector.

In particular, the current global environment shows the increasing engagement of Africa with newly emerging economies that are demanding natural resources from Africa. This has the danger of locking Africa in primary commodity sector. Two strategic policy directions in this regard could be pointed out. One is (a) the possibility of establishing an African industrial fund that should be financed from the booming resource export sector and use it for industrialization, pending on the institutional strength of African countries. A second possible avenue is to negotiate with emerging partners such as China to have 'a commodity-induced industrialization' model - which could be called 'the Non-Angolan Model' - that will ensure that emerging economies' commodity demand is not realized at the expense of the future industrialization and development aspiration of the African countries. This could be negotiated from the outset at regional and continental level first. The details of such strategy might be country specific but its generic direction needs to be along this line. For this to happen sound quality of government policies and institutions (that are able to deal with emerging countries counterparts) are needed. This is too ensure that market driven specialization of Africa is not biased against the future industrialization of the continent and thwart the opportunity for sustainable development that might have occurred by creatively using proceeds of the resource from the booming commodity export sector (See Geda *et al* 2012).

Capacity Building Implications: all the policy direction outlined thus far have implications for *capacity building*. This may take two forms. The first one relates to building the capacity of economic governance so as to make evidence based informed policy. The second relates the capacity to build institutions that will *negotiate* about natural resource exploitation with foreign firms and *manage* the rent from the booming sector in a socially optimal fashion. With regard to the former technocrats at the relevant ministries (such as the ministries of finance, central bank and government advisory bureaus) need to have capacity to use commodity and macroeconomic models as well as financial management capacity for making technical analysis, forecasting and policy simulation to inform policy makers. Such capacity building can be carried first using regional institutions that could assist countries in each region. Eventually this can be done at country level.

African countries also need *good quality institutions* to make the best out of revenues from the booming commodity sector. As has been noted by AERC (2007) policy seminar on the same issue, the boom is ideally the period during which the country should introduce new legal frameworks to manage revenues, renegotiate agreements with investors so as to capture more revenue, adding value through processing's, integrating small-scale operators into the boom, and transferring skills more rapidly to locals through training and research, as well as set up strong procedures and institutions to carry these management (AERC, 2007). The experience of Botswana shows that rents from diamond exports were distributed widely (in a socially optimal way at least among the elite) so that the opportunity cost of undermining the good institutions and thus the costs of further rent seeking for the majority were high. In the process, Botswana adopted good policies, thanks to these good institutions, that promoted rapid accumulation, investment and a socially efficient exploitation of resource rents. Similarly, the memberships of Botswana in the South African Customs Union (SACU) has served to lock in some of the good policies and served to avoid rent seeking (see Roderick, 1997; Geda 2006). Perhaps the lesson from this is the importance of regional groupings such as regional integration schemes and agreements (continental banks such as AfDB; AU etc), which could serve as agencies of restraint to leave up to commitment by member countries.

Finally, despite the general similarity of the challenge of resource flows from a booming natural resource sector among African countries, it is essential to stress that each country is unique in its own way. Each country has its own political, structural, institutional and historical features as well as commodity types (eg hard versus soft commodities) that distinguish it from others. This underscores the need to make relevant macroeconomic and long terms growth strategy policies tailor made to suit each African country's uniqueness. This is the policy direction that African policy makers need to pursue. The analysis in this study also shows that the challenges of resource flows from the booming commodity export sector in Africa may not be addressed by addressing constraints that are specific to the export sector alone. It is argued here that these challenges are challenges of a development strategy in general and industrialization strategy in particular too. Thus, addressing them need to be framed in such broader framework.

References

- Acemoglu, D., S. Johnson, et al. (2003). Institutional Causes, Macro-economic Symptoms: Volatility, Crises and Growth. *Journal of Monetary Economics* 50: 49-123.
- Acemoglu, Daron, Simon Johnson and James A. Robinson (2001) 'The Colonial Origins of Comparative Development: An Empirical Investigation', *The American Economic Review*, 91(5): 1369–1401.
- Acemoglu, Daron, Simon Johnson, James A. Robinson (2001) 'An African Success Story: Botswana', Department of Economic, Massachusetts Institute of Technology, Cambridge, MA.
- AERC (2007) 'Summary of Seminar Report' on *Managing Commodity Booms in Sub-Saharan Africa AERC Senior Policy Seminar IX*, Yaoundé, Cameroon, 27 February – 1 March,
- Akyuz, Yilmaz, Ha-Joon Chang and Richard Kozul-wright (1998) 'New Perspective on East Asian Development', *Journal of Development Studies*, 34(6).
- Alemayehu Geda (2002). *Finance and Trade in Africa: Macroeconomic Response in The World Economy context* (London/New York: Palgrave-Macmillan..
- Alemayehu Geda (2003). The Historical Origin of African Debt Crisis (*Eastern Africa Social Science Research Review*,)
- Alemayehu Geda (2006). *Export Strategy, Export Success Stories: East Asian Trade and Industrial Policy and the Lesson for Africa*. Cairo: African Import Export /Afrexim Bank.
- Alemayehu Geda (2008) *The Impact of China and India on Africa: Trade, FDI and the African Manufacturing Sector: Issues and Challenges (A Framework Paper for AERC Project :The Impact of China and India on Africa.; and also AERC Working Paper, 2006, Revised, 2008)r*,
- Alemayehu Geda (2012a). *Fundamental of International Economics for Developing Countries: A Focus on Africa: Volume I, Trade Theory, Policy and Practice* (forthcoming, Palgrave- MacMillan, London,).
- Alemayehu Geda (2012b). *The Macroeconomic Environment for Private Investment in Africa (Background Study for African Economic Commission, Addis Ababa, 2012)*
- Alemayehu Geda and Atenafu G. Meskel (2008) *China and India: A curse or blessing for Africa? The Case of Manufactured Exports (Journal of African Development, African Development Bank, 2008)*
- Alemayehu Geda, Matias Asefa and Solomon Mosisa (2012). "To be or not to be: The Dilemma of African Engagement with China and other Emerging Economies" (, under review, *Journal of International Development*,)
- Amsden, Alice H. (2001) *The Rise of the Rest: Challenges to the West from Late-Industrializing Economies*, Oxford: Oxford University Press.
- Atkinson and Hamilton (2003) - Savings, Growth and the Resource Curse Hypothesis, London School of Economics and Political Science, London, UK and The World Bank, Washington, DC, USA
- Auty (2001), the political state and the management of mineral rents in capital surplus economies: Botswana and Saudi Arabia, Lancaster University
- Avendaño, Rolando Helmut Reisen and Javier Santos (2008) 'The Macro Management of Commodity Booms: African and Latin American Response to Asian Demand' OECD Development Center, Working Paper 270.
- Benjamin, Nancy C., Shantayanan Devarajan and Robert J. Weiner (1989), "The 'Dutch' Disease in a Developing Country. Oil Reserves in Cameroon," *Journal of Development Economics* 30 (1989), pp. 71–92.
- Bevan, David, Paul Collier and Jan Willem Gunning (1993) "Trade shocks in developing countries Consequences and policy responses" *European Economic Review* 37 (1993) 557-565.
- Brahmbhatt, Milan', Otaviano Canuto, and Ekaterina Vostroknutova (2010) 'Dealing with Dutch Disease', *Economic Premise*, June 2010, No. 6. The World Bank.
- Cashin, P., and Mcdermott, C.J. (2006), "properties of international commodity prices: identifying trends, cycles and shocks", in A. Sarris and D. Hallam (editors). *Agricultural commodity markets and trade*. Cheltenham UK, ELGAR
- Cashin, Paul, and C. John McDermott, "The Long-Run Behavior of Commodity Prices: Small Trends and Big Variability," *IMF staff papers* 49 (2002), 175–199.
- Collier, P., and A. Hoeffler. (2009) "Testing the Neocon Agenda: Democracy and Natural Resource Rents." *European Economic Review* 52 (3): 293– 308.
- Collier, P., and B. Goderis. 2012. "Commodity Prices and Growth: An Empirical Investigation" *European Economic Review* 56 (2012) 1241–1260.
- Collier, P., F. van der Ploeg, M. M. Spence, and A. J. Venables. 2009. "Managing Resource Revenues in Developing Economies." *IMF Staff Papers* (2010) 57: 84–118.
- Collier, Paul, 2011, "Savings and Investment Decisions in Low-Income Resource Exporters," unpublished, Centre for the Study of African Economies, (Oxford, UK: Oxford University).

- Collier, Paul, and Benedikt Goderis, 2007, "Commodity Prices, Growth, and the Natural Resource Curse: Reconciling a Conundrum," CSAE Working Paper No. 2007-15 (Oxford: University of Oxford, Center for the Study of African Economies).
- Collier, Paul, Rick van der Ploeg, Michael Spence, and Anthony J. Venables, 2010, "Managing Resource Revenues in Developing Economies," IMF Staff Papers, Vol. 57, No. 1.
- Combes Jean-Louis and Guillaumont Patrick (2002). Commodity Price Volatility, Vulnerability and Development. Development Policy Review.
- Corden, W. M., and P. J. Neary. 1982. "Booming Sector and Deindustrialization in a Small Open Economy." *Economic Journal* 92: 825-48.
- Cuddington J. T. and Jerrett D. (2008), "Super Cycles in Real Metals Prices?", IMF Staff Papers, 55(4): 541-565.
- Cuddington, J. and C.M. Urzua (1989). "Trends and Cycles in the Net Barter Terms of Trade: A New Approach," *Economic Journal*, Vol. 99, 426-42.
- Cuddington, J.T. (1992), "Long-run trends in 26 primary commodity prices: A disaggregated look at the Prebisch-Singer hypothesis", *Journal of Development Economics*, 39:207-227.
- Cuddington, J.T. and Liang, H. (2003), "Commodity Price Volatility across Exchange Rate Regimes", working paper.
- Cuddington, John T and Carlos M. Urzúa (1988), "Ciclos y tendencias en los términos netos de intercambio: un nuevo enfoque", *Estudios Económicos*, vol. 3, No. 2, El Colegio de México, Mexico, July-December.
- Cuddington, John T, Rodney Ludema and Shamila Jayasuriya (2002), "Reassessing the Prebisch -Singer Hypothesis: Long-Run Trends with Possible Structural Breaks at Unknown Dates", Georgetown University Working Paper, October.
- Cuddington, John T. and Hong Wei (1992), "An Empirical Analysis of Real Commodity Price Trends: Aggregation, Model Selection, and Implications", *Estudios Económicos* 7, 2, July-December.
- Deaton, A. (1999) 'Commodity Prices and Growth in Africa,' *Journal of Economic Perspectives*, 13(3), 23-40.
- Deaton, A. and G. Laroque (1992). 'On the Behaviour of Commodity Prices,' *Review of Economic Studies*, 59(1), pp 1-23.
- Deaton, A. and R. Miller (1996). 'International Commodity Prices, Macroeconomic Performance and Politics in Sub-Saharan Africa,' *Journal of African Economies*, 5(3), pp. 99-191.
- ECA, UN Economic Commission for Africa (2007). *Economic Report on Africa: Accelerating Africa's Development through Diversification*. Addis Ababa: Economic Commission for Africa.
- Economic Commission for Africa (2012), *Economic Report on Africa 2012 :Unleashing Africa's Potential as a Pole of Global Growth*, Addis Ababa, Ethiopia.
- Elbadawi, Ibrahim and Linda Kaltani (2007) 'Strategies for Managing the Current Oil Boom' *Managing Commodity Booms in Sub-Saharan Africa AERC Senior Policy Seminar IX Seminar Report*, Yaoundé, Cameroon, 27 February – 1 March,
- Fata 's, Antonio, and Ilian Mivhoh, "Policy Volatility, Institutions and Economic Growth," INSEAD, unpublished manuscript of Economic Research, 1926).
- Freeman, Richard B. and David L. Lindauer (1999) 'Why not Africa?' National Bureau of Economic Research, NBER Working Papers Series, Working Paper No. 6942
- Gary, Ian and Terry Lynn Karl(2003). "Bottom of the Barrel: Africa's Oil Boom and the Poor." Catholic Relief Services.
- Gylfason (2000) - Natural Resources, Education, and Economic Development for the 15th Annual Congress of the European Economic Association
- Hélène Ehrhart and Samuel Guérineau (2012), Commodity price volatility and Tax revenues: Evidence from developing countries, CERDI,
- Hnatkovska, Viktoria, and Norman Loayza, "Volatility and Growth," in J. Aizenman and B. Pinto (Eds.), *Managing Economic Volatility and Crises: A Practitioner's Guide* (Cambridge: Cambridge University Press, 2005).(Princeton, N.J.: Princeton University Press, 1978).
- limi, A.(2006). "Did Botswana Escape from the Resource Curse?" IMF Working Paper WP/06/138. Washington, D.C.: International Monetary Fund.
- IMF (2005), *Regional Economic Outlook: Sub-Saharan Africa*, Washington, D.C.
- IMF (2007a), *Regional Economic Outlook: Sub-Saharan Africa* (Washington, April).
- IMF (2009), *Chad: Selected Issues*, IMF Country Report No. 09/67, Washington, D.C.
- IMF(2006, 2008). *World Economic Outlook: Financial Systems and Economic Cycles*. Washington, D.C.
- IMF(2010), *Understanding Financial Interconnectedness*, electronically available.
- IMF(2011), *Revenue Mobilization in Developing Countries*, (Washington, April).
- IMF(2012), *World Economic Outlook, World Economic and Financial Surveys* (Washington, April).
- IMF(2012), *Regional Economic Outlook : Sub-Saharan Africa Sustaining Growth amid Global Uncertainty*, Washington, D.C.
- IMF, (2009), *Regional Economic Outlook: Sub-Saharan Africa* (Washington, April).
- IMF,(2007b), *Guide on Resource Revenue Transparency* (Washington, October).

- Ismail, K. 2010. "The Structural Manifestation of the 'Dutch Disease': The Case of Oil Exporting Countries." Working Paper 10/103. International Monetary Fund, Washington, DC.
- Ismail, Karim (2009), "The Structural Manifestation of the 'Dutch Disease': The Case of Oil Exporting Countries", IMF Working Paper 10/103, Washington, D.C.
- Jan-Peter Olters(2007), Old Curses, New Approaches? Fiscal Benchmarks for Oil-Producing Countries in Sub-Saharan Africa , IMF Working Paper WP/07/107
- Jomo, K.S. and Michael Rock (2003) 'Resource Exports and Resource Processing for Export in Southeast Asia', in Ernest Aryeetey, Julius Court, Machiko Nissanke and Beatrice Weder (2003) *Asia and Africa in the Global Economy*, Tokyo: United Nations University Press.
- Juan Pedro Treviño(2011), Oil-Price Boom and Real Exchange Rate Appreciation: Is There Dutch Disease in the CEMAC? IMF, Working Paper, WP/11/268
- Kaplensky, R (2008) China and the terms of trade: the challenge to development strategy in SSA (Paper prepared for Rise of China: Global Opportunities and Challenges Conference, Mount Holyoke, March 2008).
- Leandro Medina(2010), A Commodity Curse ? The Dynamic Effects of Commodity Prices on Fiscal Performance in Latin America, The George Washington University, Department of Economics
- Little, I.M.D., Cooper, R.N., Corden, W.M., Rajapatirana, S., 1993. Boom, Crisis, and Adjustment: The Macroeconomic Experience of Developing Countries. Oxford Univ. Press, Oxford.
- Loayza, Norman V., Romain Rancie`re, Luis Servé`n, and Jaime Ventura, "Macroeconomic Volatility and Welfare in Developing Countries:An Introduction,"*World Bank Economic Review* 21 (2007), 343–357.
- MacBean, A.I, and D. T. Ngyuen, 1980. Commodity concentration and export earnings instability: a mathematical analysis, *The Economic Journal*, 90, June, 363-370.
- MacBean, A.I. 1966. Export instability and economic development. Cambridge, Mass.: Harvard University Press.
- Matthew Kofi Ocran and Nicholas Biekpe(2008), Primary Commodity Export and Economic Growth in Sub Sahara Africa: Evidence from Panel data analysis,
- Mauricio Cárdenas, Santiago Ramírez, Didem Tuzemen (2011), Commodity Dependence and Fiscal Capacity, the Latin America Initiatives, Brookings.
- Medina, L. (2010) 'The Dynamic Effects of Commodity Prices on Fiscal Performance in Latin America,' IMF Working Papers No.10/192.
- Mehlum, H., K. Moene, and R. Torvik. 2006. "Institutions and the Resource Curse." *Economic Journal* 116 (508): 1–20.
- Michael Bleaney), David Greenaway(2001),The impact of terms of trade and real exchange rate volatility on investment and growth in sub-Saharan Africa, *Journal of Development Economics*. Vol. 65 , 491–500
- Mintz, Ilse, Cyclical Fluctuations in the Exports of the United States since 1879 (New York: National Bureau of Economic Research, 1967).
- Moses Obinyeluaku and Nicola Viegi(2008), Fiscal Policy Rules for Managing Oil Revenues in Nigeria , University of Cape Town and ERSA ,2007.
- Neumayer (2004) - Does the 'Resource Curse' hold for Growth in Genuine Income as well? ,London School of Economics
- Oscar Calvo-Gonzalez, Rashmi Shankar, Riccardo Trezzi(2010), Are Commodity Prices More Volatile Now? A Long-Run Perspective, The World Bank Policy Research Working Paper 5460
- Poelhekke, Steven, and Frederick van der Ploeg, "Volatility, Financial Development and the Natural Resource Curse," CEPR discussion paper no. 6513 (2007). *Journal of Development Economics* 74 (2004), 53–85.
- Prebisch, R. 1950. The economic development of Latin America and its principal problems. New York: United Nations Economic Commission for Latin America.
- Ramey G. and V.A. Ramey. ``Cross-country evidence on the link between volatility and growth." *American Economic Review* 85(5) (1995):1138-1151.
- Rodrik, Dani (1997) 'Trade Policy and Economic Performance in Sub-Saharan Africa', Study Report Prepared for the Ministry of Foreign Affairs, Sweden 1997.
- Ryan Hawthorne,Reena Das Nair,Keith Bowen(2005), An overview of the impact of the commodity price boom on the South African economy , in Trade and Uneven Development: Opportunities and Challenge Annual Forum.
- Sachs, J. D., and A. M. Warner, 1997, "Natural Resource Abundance and Economic Growth," The Center for International Development, (Cambridge, Massachusetts: CID).
- Sachs, J. D., and A. M. Warner. 1995. "Natural Resource Abundance and Economic Growth." Working Paper 5398. National Bureau of Economic Research, Cambridge, MA.
- Sachs, J. D., and A. M. Warner. 2001. "The Curse of Natural Resources." *European Economic Review* 45 (4–6): 827–38.
- Sala-i- Martin, Xavier and Arvind Subramanian (2003), "Addressing the Natural Resource Curse: An Illustration from Nigeria," NBER Working Paper 9804, Cambridge, Mass.

- Sala-i-Martin, X., and A. Subramanian. 2003. "Addressing the Natural Resource Curse: An Illustration from Nigeria." Working Paper 03/139. International Monetary Fund, Washington, DC.
- Santiago Ramírez, Didem Tuzemen, Mauricio Cárdenas (2011), Commodity Dependence and Fiscal Capacity
- Sarraf, Maria and Jiwanji (2001), "Beating the Resource Curse. The Case of Botswana," Environment Department Papers, The World Bank Group, Washington, D.C.
- Sarraf, Maria and Jiwanji (2001), "Beating the Resource Curse. The Case of Botswana," Environment Department Papers, The World Bank Group, Washington, D.C.
- Singer, H.W. 1950. "The distribution of gains between investing and borrowing countries." *American Economic Review* 40, pp. 473-485.
- Siphambe, Happy (2007) 'Management of Previous Solid Mineral Booms in SSA' *Managing Commodity Booms in Sub-Saharan Africa AERC Senior Policy Seminar IX Seminar Report*, Yaoundé, Cameroon, 27 February – 1 March,
- UNCTAD (2009). The financialization of Commodity Market. Trade and Development Report 2009.
- UNCTAD (2010). Least Developed Countries Report 2010: Towards a New International Development Architecture. United Nations publications. Sales No. E.10.II.D.5. New York and Geneva.
- UNCTAD(2007), Commodity Price Statistics (New York: U.N. Conference on Trade and Development).
- UNCTAD(2011), Unraveling the underlying causes of price volatility in world coffee and cocoa commodity markets, Discussion paper 1
- Van der Ploeg, F., 2011, "Natural Resources: Curse or Blessing?" *Journal of Economic Literature*, Vol. 49, No.2, pp. 366–420.
- Van Wijnbergen, S., 1984, "The 'Dutch Disease': A Disease After All?" *The Economic Journal*, Vol. 94, No. 373, pp. 41–55.
- Williamson, Jeffrey G "Globalization and the Great Divergence: Terms of Trade Booms and Volatility in the Poor Periphery, 1782–1913," *European Review of Economic History* 12 (2008), 355–391.
- World Bank, 2011. Boom, Bust And Up Again? Evolution, Drivers And Impact Of Commodity Prices: Implications For Indonesia. Poverty Reduction and Economic Management Department, East Asia And Pacific Region
- World Bank, 2009, Global Economic Prospects: Commodities at the Crossroads (Washington: World Bank).
- Zafar, A., and K. Kubota. 2003. "Regional Integration in Central Africa: Key Issues." Africa Region Working Paper 52. Washington, D.C.: World Bank.

Annex 1 Commodity Dependence in Africa (2004-2009)

Country Name	Agricultural raw materials exports (% of merchandise exports)		Food exports (% of merchandise exports)		Fuel exports (% of merchandise exports)		Manufactures exports (% of merchandise exports)		Primary commodities exports(% of merchandise exports)		Three main exports*, with their share in total exports**	
	Average of 2004-2009	2009	Average of 2004-2009	2009	Average of 2004-2009	2009	Average of 2004-2009	2009	Average of 2004-2009	2009	Products	No of products accounting for more than 75 per cent of exports
Africa	2.8	2.1	11.4	11.2	41.4	45.9	32.3	29.6	57.5	0	Petroleum ,Crude (51.6%) [19.0%];Natural gas (4.2%) [24.2%] Petroleum , other than crude bituminous(3.9%) [3.3%];	25
Algeria	0	0	0.2	0.3	97.7	97.7	1.5	1.6	98.2	0	Petroleum ,Crude(61.6%);Petroleum ,other than crude(10.0%);Natural gas (9.5%)	3
Angola	#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!		96.0	84.5	Petroleum ,Crude(97.0%)	1
Benin	60.3		28.3		0.1		10.7		0	0	Cotton(25.7%);Petroleum ,other than crude(23.9%);cashew nuts. (12.6%)	5
Botswana	0.2	0.2	3.1	5.1	0.2	0.3	79.7	78	85.68	70.3	Diamond (38.2%);Nickel mattes (31.3%);diamond(6.6%)	3
Burkina Faso	70.6	60.5	20.6	26.8	0	0	8.4	12.1	75.8	69.3	Cotton (54.4%); Gold (15.3%),Sesames seeds (8.1%);	3
Burundi	4.8	4.8	75.1	67.5	1.5	1.9	13.8	20.6	!	0	Coffee (45.7.%); gold(18.1%,tea (7.7%);	4
Cameroon	13.8		16		52.6		3.2		60.4	0	Petroleum ,Crude(53.8%);Wood(8.1%);bananas (7.7%)	4
Cape Verde	0	0	46	72.6	0		53.7	26.7		0	Fish (36.6%);skipjack(15.9%);upper and parts (6.8%)	7
Central African Republic	42.9		1.3		0.3		26.3		93.8	0	Wood (28.3%);tropical hardwood (17.2%);diamonds(15.1%)	5
Chad	#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!		0	0	Tropical hardwood (94.0)	1
Comoros	0		70.8		#DIV/0!		8.9		88.7	86.92	Essential oils (26.0.) ;Cloves (19.6%),Vessels (17.7.%	5
Congo, Dem. Rep.	#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!		0	0	Petroleum oil(25.5%), copper ores (16.3%)copper unrefined(15.2)	1
Congo, Rep.	#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!		99.4	106.6	Cobalt ores and concentrates (85.6%)	5
Cote d'Ivoire	8.1	5.7	41.2	48.2	30.6	30	15.8	15.1	41.3	48.40	Cocoa (28.6%); Petroleum, crude (15.4%);petroleum oil &obtained (8.1%)	9
Djibouti	0	0	0.4	0.4	6.5	6.5	90.7	90.7	0	0	Petroleum, non crude (21.1%), Sheep (12.7%); animals live	11

											(11.1%);	
Egypt, Arab Rep.	2.8		8.7		49.5		26.2		70.29578	63.3	Natural gas (20.4%); Petroleum, crude (12.5%); Petroleum, other than crude (10.8%)	51
Equatorial Guinea										0	Petroleum, crude (76.5%)	1
Eritrea									0	0	Diesel powered trucks (22.6%); seeds (7.8.);cotton(7.1%)	15
Ethiopia	15.2	11.9	74.3	77.5	0	0	7.5	8.7	83.9	83.30	Coffee (32.9%);Sesames seeds (13.3%);Fresh flowers (8.2%)	10
Gabon	8		1.1		81.9		4.8			0	Petroleum, crude (65.8%); Manganese ores and concentrates, in (17.7%);	2
Gambia, The	3.5	1	68.3	53	0.2	0	24.2	39.1		0	Cashew nuts (48.5%); iron or steel. (6.7%), Titanium ores and concentrates. (4.7%);	8
Ghana	7.5		59.7		1.9		25.8		68.4	61.19	Cocoa (42.8%); Manganese ores and concentrates, in (15.3%); Petroleum, other than crude (4.3%)	9
Guinea	2.8		6.2		0.6		15		8.2	0	Aluminum ores and concentrates. (50.2%); Aluminum oxide (13.1%); petroleum oil (11.4%)	4
Guinea-Bissau	0.2		98.7		0.8		0.1		79.4	73.43	Cashew nuts (92.9%)	1
Kenya	12.8	13.2	44	44	6.2	4.2	33.9	36.6	0	0	Black tea (12.3%) Cut flowers and flower buds, fresh (10.3%); Other aircraft propeller (7.7%)	29
Lesotho	0.7		4.7		0		94.5		30.0	44.7	Jerseys, pullovers cotton knitted, (40.8%); mens/boys trousers and shorts of cotton, (14.5%), Diamonds (12.4.%)	5
Liberia	#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!		0	0	Petroleum oil and oil obtained (23.2%);Other vessels for the transport of goods and/or persons (22.9%);Natural rubber latex(12.8%)	5
Libya	#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!		0.34	0.31	Petroleum, crude (88.4%)	1
Madagascar	4.3	5.2	30.9	28.8	4	4.9	52.6	57.2	0	0	Shrimps and prawns (10.3%); vanilla. (9.9%), Jerseys, pullovers, cardigans, waist-coats and similar articles, knitted or crocheted, of wool or fine animal hair (7.5%);	30
Malawi	4.1	3.8	83.1	86.6	0.1	0.1	12.3	8.5	53.2	48.34	Tobacco (50.4%); Raw sugar (10.7%); Other black tea (6.2%)	5
Mali	61		20.9		2.5		13.3			0	Cotton (66.5.%;); seeds (6.1%)Guavas, mangoes and mangos teens (4.0%);	3
Mauritania	0		20.8		23.7		0		80.7	0	Iron ores and concentrates,(45.2%);Petroleum ,other than crude(17.6%);copper ores(13.1%)	3
Mauritius	0.5	0.9	28.3	32.4	0.1	0	62.2	64.6	28.7	31.08	T-shirts, singles and other vests, knitted or crocheted; of cotton (15.0%); raw sugar. (14.2%); Prepared of Preserved Fish (11.8%)	29
Morocco	1.5	1.6	19.7	22.1	2.1	2	66.5	65.4	43.9	42.7	Phosphoric acid and phosphoric acids (11.2%); Electronic integrated circuits and micro assemblies: other monolithic integrated circuits. (6.9%); Natural calcium phosphates, ;	64

											ungrounded. (3.6%)	
Mozambique	3.7	3.1	15.7	23.3	14.3	17.5	6.7	11.7	96.1	84.7	Aluminum, not alloyed (36.6%); Petroleum other than crude (8.5%); Electrical energy (6.3%)	4
Namibia	0.6		26.5		0.5		46.9		67.6	62.8	Natural uranium and its compounds,(18.5%), uranium (22.6%)Fish, (11.2%);	10
Niger	3.4		24.5		1.8		10.3		0	0	Spacecraft satellite (27.8%); natural uranium (22.6%), petroleum oil (20.9%)	4
Nigeria	0.8	1.1	1.9	4.5	93.5	90.4	3.2	3.6		0	Petroleum, crude (85.2%)	1
Rwanda	3.2	1.7	54.2	42.3	0	0.1	6.3	19.4		0	Coffee (30.4%); niobium tantalum (26.1%) Tin ores and concentrates. (21.6%);	3
Sao Tome and Principe	0.6	0.7	93.9	92.4	0	0	4.8	3	44.0	0	Cocoa (61.1%); raw sugar. (4.3%); article iron or steel (2.3%)	6
Senegal	2.6	1.1	32.5	29.5	19.7	24	40.5	41.3	32.3	39.9	Petroleum, other than crude (29.7%); Phosphoric acid and phosphoric acids (10.7%); Portland cement. (6.3%)	19
Seychelles	0		87.9		0		4.2		3.4	3.8	Tunas, skipjack and bonito (54.7%); tunas frozen excluding (8.8%) Yellow fin tunas (8.6%);	4
Sierra Leone									126.2	145.0	Diamonds (25.1%) petroleum oils & oil obtained. (12.7%); Aluminum ores and concentrates. (11.7%);	9
Somalia											Goats (16.1%); waste and scrap of gold (15.9%)Live bovine animals (9.5%);	9
South Africa	1.9	1.9	8.1	10.2	10	11.1	53.1	47.5	36.1	36.1	Platinum, Unwrought (9.0%); Diamonds, (5.3%); Gold, unwrought (4.6%)	83
Sudan	2.9	1.4	6.2	5.6	89.7	92.1	0.2	0.4	101.5	0	Petroleum, crude (91.6%)	1
Swaziland	8		19.7		0.9		64		51.6	0	Raw sugar (15.3%); Mixtures of odoriferous substances (10.7%) Food preparations not elsewhere specified or included. (9.4%);	31
Tanzania	11.7	9.8	47.8	35.5	0.9	1	21.3	24.6	77.0	69.9	Tobacco, (6.5%); Fish fillets and other fish meat, fresh or chilled. (6.2%) Cotton, (5.9%)	37
Togo	11.3		20.4		0.5		55.9		30.9	0	Cotton (41.5%); cocoa (14.5.0%); natural calcium phosphates (6.9%)	7
Tunisia	0.6	0.5	10.2	9.2	13.8	13.6	73.8	75.4	0	0	Petroleum, crude (12.3%); Men's/boys trousers and shorts, of cotton, not knitted (5.3%); ammonium phosphate (5.0%)	71
Uganda	10.7		66.2		2.4		18.7		24.2	21.8	Coffee, (32.5%); Fish fillets and other fish meat, fresh or chilled (9.5%); tobacco, (6.9%)	17
Zambia	3.6	1.4	9.2	7.5	0.9	0.9	7.8	8.4	!	0	Refined copper (56.4. %); Copper ores and concentrates. (8.2%); Cobalt mattes and other intermediate products of cobalt (6.0%)	4
Zimbabwe	15.6	23.1	21.7	19.3	7.3	0.9	35.9	34.3	50.7	45.5	Ferro –chromium carbon (13.4%); Tobacco, (12.3%); Nickel matters (11.0%)	14

Source: The last two columns are from African Economic Outlook 2010. The rest are computed from World Bank, ADI (2011) Database

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