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FRAGILE STATES, COMMODITY BOOMS  
AND EXPORT PERFORMANCE:  
AN ANALYSIS OF THE SUB-SAHARAN AFRICAN CASE

Andrew Mold and Annalisa Prizzon



**EUROPEAN UNIVERSITY INSTITUTE, FLORENCE**  
**ROBERT SCHUMAN CENTRE FOR ADVANCED STUDIES**  
**EUROPEAN REPORT ON DEVELOPMENT**

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An Analysis of the Sub-Saharan African Case*

**ANDREW MOLD AND ANNALISA PRIZZON**

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## **Abstract**

Sub-Saharan Africa's export performance over recent decades has typically been portrayed as poor compared to other regions in developing countries. This paper takes a new look at the record, using data on the volume rather than the value of African exports. When analysed in volume terms a different picture of African export performance emerges. Despite being confronted by sharply declining prices, between 1995-2001 African exports expanded by an average of 5.9 percent annually. The picture changes quite significantly during the post-2002 commodity price boom period, with increases of 5.2 per cent per annum in average volumes. By using a dynamic panel of 36 Sub-Saharan countries, the aim of this paper is to analyse this apparent paradox, using data available from UNCTAD. Specifically, we investigate the price-elasticity response of African exporters in the light of dramatically shifting unit prices. In the context of the EDR project, we also specifically look at the question of whether countries classified as 'fragile states' have been especially disadvantaged in terms of their export performance.

## **Keywords**

Export determinants, Sub-Saharan Africa, export performance, commodity prices





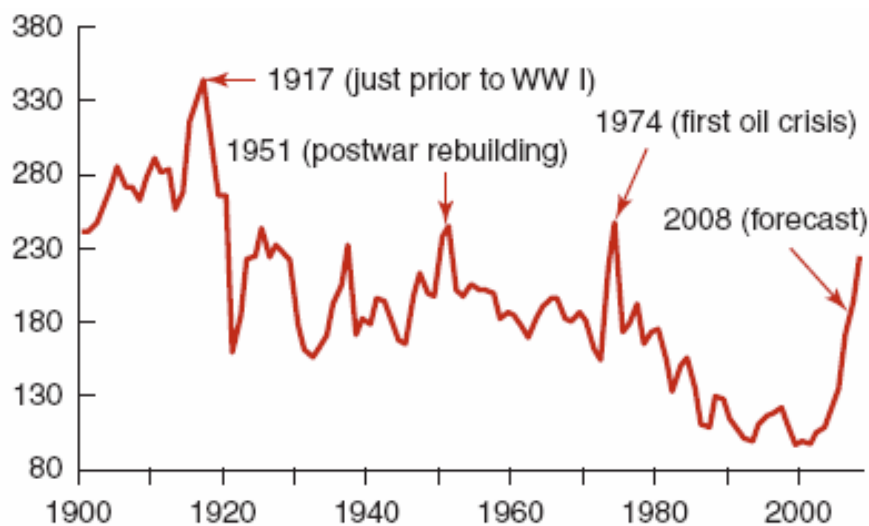
## 1. Introduction\*<sup>1</sup>

In recent decades, it has not been difficult to find statements lamenting Africa's purportedly poor export performance. For example, in 2005, the Commission for Africa Report suggested that:

“[...]The last three decades have seen stagnation in Africa. The composition of Africa's exports has essentially remained unchanged, and has contributed to a collapse in Africa's share of world trade.[...] Africa will not be able to achieve the Millennium Development Goals, nor set itself on a sustainable path to growth and poverty reduction, without increased trade.” (Commission for Africa, 2005:256).

Is this kind of affirmation justified? This paper takes a new look at the record, using data on the volume, rather than the value, of Sub-Saharan African exports, and in the light of what has been, up until a few months ago, the most sustained commodity price boom since the early 1900s (World Bank, 2008) (Figure 1).

**Figure 1: Real Prices for Commodities over the Long-Run, 1900-2008, yr2000=100**



*Source:* Grilli and Yang (1988) for 1900 to 1947; World Bank for 1948 to 2008.

Up until the early 2000s, one of the most important stylised facts of African exports is that exporters had been facing a sharp decline in the price of most of their commodities. World prices for many of the commodities that Africa exports declined sharply between 1990 and 2000: cocoa, cotton, sugar and copper by over 25 per cent, coffee by 9 per cent and minerals overall declined by 14 per cent (WTO, 2001: 212). Product price instability was also a major problem for exporters. One half of traditional products experienced average price changes of 50 per cent or more during the 1990s (Ng and Yeats, 2002). Price changes were associated with the collapse of traditional product prices, and this reduced the value of export earnings.

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<sup>1</sup> The views expressed herein are solely those of the authors and do not necessarily represent the views of the OECD. They contributed this paper in their personal capacities. The authors would like to thank Flavine Creppy (UNCTAD) for collaboration with providing data, Augustin Fosu and Oliver Morrissey for the comments on an earlier draft of this paper, and also all the participants at the Cambridge ERD Workshop held in March 2009. Any errors are of course the responsibility of the authors.

Yet, despite being confronted by sharply declining prices, between 1990-2001, the volume of exports for Sub-Saharan African non-oil exporters actually increased by an average of 5 per cent annually. This impressive supply-side performance has not been properly documented: previous studies having fixed too much attention to the *value* of African exports, something which, as primary commodity exporters, is largely beyond their control.

Subsequent developments were largely unexpected. Commodity prices surged from 2001-8, in the longest sustained boom since the early 1900s (World Bank, 2008). Indeed, while, for Africa as a whole, export unit prices fell by 2 per cent per annum between 1995 and 2001, they increased at a yearly rate of 17 per cent between 2002 and 2006 (UNCTAD, 2008a). Many analysts forecast a long-term super-cycle for commodity prices, and the structural long-term problems of low prices and high volatility of commodity prices were largely forgotten.

How did African country exporters respond to this new international context and heavy demand for many of its traditional exports? Ironically enough, export performance for African countries (as measured in volumes) actually improves less rapidly with increases of 5.2 per cent in average volumes between 2002-2006, despite surging prices. Put bluntly, the supply-side response in the face of the commodity price boom was disappointing, especially when contrasted with the fairly strong performance that was evident in the period from 1980-2001. The aim of this paper is to analyse the performance of African exports at the aggregate level in volume terms, using data available from UNCTAD. Specifically, we investigate the price-elasticity response of African exporters in the light of dramatically shifting unit prices. In the context of the EDR project, we also specifically look at the question of whether countries classified as “fragile states” have been especially disadvantaged in terms of their export performance.

The structure of the paper is as follows. Section 2 presents some of the stylised facts on African exports. Section 3 provides a literature review of the supply side response of African exporters, both in the agricultural and non-agricultural sectors. Section 4 discusses the policy environment in which African trade performance has to be considered. Section 5 presents the main econometric results. Section 6 concludes by drawing some policy implications.

## **2. Africa’s Trade Performance in Perspective – The Key Role of Prices**

One of the most extensively cited stylised facts of African trade performance is that the continent’s share in world merchandise trade, measured in value terms, has declined steadily since 1980, from around 6 per cent to around 2 per cent in the late 1990s, with a subsequent mild recovery (due mainly to the recovery in prices of some key exports) in the 2000s to around 3 per cent. This decline in the world share of exports has been particularly marked for Western and Southern Africa. However, as Morrissey (2005: 1134) argues, this does not mean that trade is unimportant for Africa: compared to other developing country regions, Sub-Saharan Africa (SSA) tends to have high export/GDP and import/GDP ratios. In simple terms, exports are very important to African countries even if African exports are not very important in the world market.

Economists are divided on the significance of Africa’s declining share in world markets (Gibbon and Ponte, 2005: 38). Some present deeply pessimistic assessments – Sachs and Warner (1997), for example, portray Africa’s trade performance as having been an unmitigated disaster. Others, however, present a more nuanced interpretation. Using a gravity model specification, Rodrik (1999) arrives at the conclusion that, when other variables affecting trade are controlled for (such as location and per capita income),

“there is little evidence that trade policies have repressed trade volumes below cross-national benchmarks, unless they have done so indirectly through their depressing effect on incomes.....once the focus is shifted from trade to economic growth in general, we are forced to think more broadly about the whole range of growth determinants, and not just the impediments to exchanges at the border.” (*ibid.*, page 113).

For example, from 1995 to 2001, a period still characterised by low commodity prices, many African countries still managed to expand their export *volumes* significantly (Table 1), increasing at an average annual rate of 5.9 per cent per annum, only slightly less than for Africa than for the developing world as a whole (7.6 per cent). In contrast, during the period of high commodity prices since 2002, export performance was actually worse if looked at from the point of view of volumes, expanding at an annual average rate of 5.2 per cent. In particular, despite the boom in commodity prices, export volume performance in Eastern and Middle Africa<sup>2</sup> markedly worsens: annual growth rate of export volume amounts to 11.3 per cent and 9 per cent for Middle African countries in the periods 1995-2001 and 2002-2006 respectively; 7.7 per cent and -0.3 in the case of Eastern African countries. The key difference between the two periods from 1995-2001 and 2002-2006 is that, while export prices decreased for African countries by -2.1 per cent per annum in the first period, they increased by 19.1 per cent per annum in the second period.<sup>3</sup> The story is a similar one in the case of Latin America where, despite an annual growth rate of 7.7 per cent in the export price index over the period 2002-2006, the export volume index increased by only 5.7 per cent. In contrast, over the period 1995-2001, the export volume annually grew by 9.4 per cent while the annual growth rate of the export price index was negative (-2.2 per cent). Taking into account sample composition (see Annex A.3.), the case of Oceania is emblematic: despite an upsurge in the export unit value index of 20.1 per cent in the period 2002-2006, the growth rate of the export volume index is actually negative (-0.6). Prices, then, play a key role in explaining the difference in export performance between the two periods.

**Table 1: Value, Volume, Price Indices, 1995-2006 (% Annual Change)**

	1995-2001			2002-2006		
	Value indices of exports	Volume indices of exports	Unit value indices of exports	Value indices of exports	Volume indices of exports	Unit value indices of exports
World	3.0	5.9	-2.7	16.9	7.7	8.5
Developing economies	5.0	7.6	-2.4	21.6	11.2	9.4
Developing economies: Africa	3.6	5.9	-2.1	25.3	5.2	19.1
Eastern Africa	1.1	7.7	-6.1	14.3	-0.3	14.7
Middle Africa	5.6	11.3	-5.1	35.8	9.0	24.5
Northern Africa	5.6	5.2	0.4	28.1	6.1	20.7
Southern Africa	0.8	4.1	-3.2	18.4	5.6	12.1
Western Africa	3.3	3.0	0.4	24.5	4.0	19.7
Developing economies: America	7.3	9.4	-2.0	18.1	5.7	11.7
Developing economies: Asia	4.7	7.4	-2.6	22.0	13.3	7.7
Developing economies: Oceania	-4.2	-9.1	5.4	20.2	-0.6	21.0

Source: Calculated from UNCTAD Handbook of Statistics, 2008

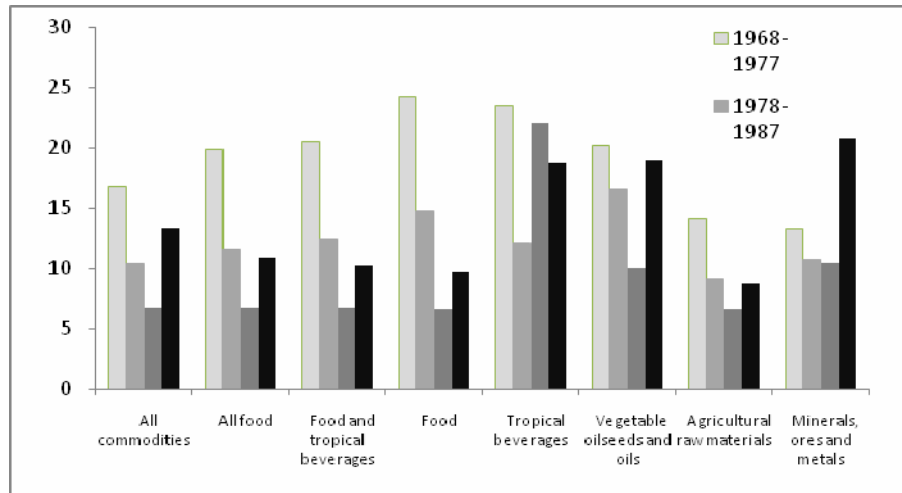
It is often suggested that the key export problem for developing countries has not been the prices of commodities *per se*, but rather their volatility. It is certainly the case that some countries have been very negatively affected by price volatility – it can play havoc with government revenues and adversely impact on public expenditure in areas such as health, infrastructure and education. It is also often argued that with the trend towards the globalisation of markets and increasing liberalisation,

<sup>2</sup> See Annex A.3. for country composition of regional aggregates.

<sup>3</sup> These price increases in the 2002-6 period might seem quite moderate in view of the strong rise in prices in 2007 and the first half of 2008. When the financial markets weakened from mid-2007, investors moved much of their money into the markets for oil, gold, cereals and other commodities. However, the UNCTAD data is not yet available for these two periods.

volatility has increased (for example, Rodrik, 1999). In terms of the key commodities for African producers, this is not necessarily correct - on average price volatility declined significantly over the course of the 1970s, 1980s and 1990s for all commodities except for tropical beverages, though it did increase again quite significantly during the boom of the 2000s (Figure 2).

**Figure 2: Commodity Price Instability<sup>4</sup> – 1970-2007 (annual average percentage variation)**



Source: Calculated from UNCTAD Handbook of Statistics, 2008

The problems of volatility, important as they are, should not detract from the underlying problems of a secular decline in the terms of trade. Ever since the controversial and path-breaking studies of Singer (1950) and Prebisch (1950), a debate has raged over the net barter terms of trade for commodity exporters *vis-à-vis* the exporters of manufactured goods. Some authors have tried to dismiss the hypothesis, pointing out (correctly) that the trend depends on the period chosen, and on the relative importance of primary commodities in the total composition of developing country exports.<sup>5</sup> Nevertheless, over the long run, the basic hypothesis has been repeatedly tested and found valid (for example, Spraos, 1983; Bloch and Sapsford, 2000, Ocampo and Parra, 2003).

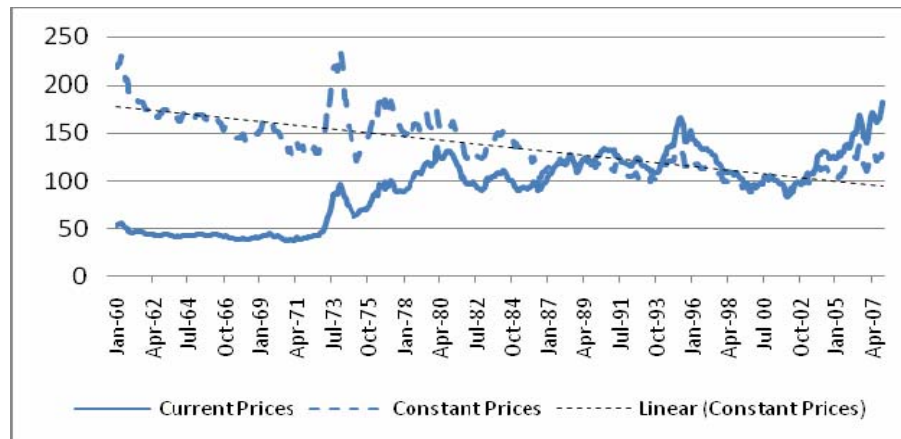
During the commodity boom of recent years, such debates have largely been overlooked, as developing country exporters have enjoyed a period of strong prices. Serious concerns over the global “food crisis”, as food prices soared over recent years, have also contributed to overshadowing the issue of long-term price trends. Yet it would be wrong to take the recent commodity boom out of perspective. For hard commodities, many of the increases have been the largest seen since the commodity boom of the 1970s. But for “soft commodities”, upon which many low-income countries rely, this has not been the case (for example, Figure 3).<sup>6</sup>

<sup>4</sup> The price instability index is calculated as the average percentage deviation of prices from their exponential trend.

<sup>5</sup> For instance, in his otherwise exhaustive text book Feenstra (2004:338) dispatches the hypothesis with the simple one-line affirmation that “*there is little evidence to support that hypothesis in general*”.

<sup>6</sup> It is worth noting that the increasing terms of trade in favour of African countries between 2003 and 2008 was large, by 7.8 per cent, mainly due to gains by oil exporting countries, which amounts to 16.9 per cent. But the gains by non-oil exporters were very low, at just a meagre 1.1 per cent (IMF, 2008).

**Figure 3: Agricultural Raw Material Prices 1960-2008**



Source: Calculated from UNCTAD Handbook of Statistics, 2008.

Notes: Constant prices have been calculated by deflating by the Unit Price for Manufactured Goods.

Although the issue has become complicated in the past decade by a sharply declining trend in manufacturing products (on which we will comment more in a moment), theoretical analysis suggests several reasons why agricultural commodity prices fall relative to others. Firstly, because of relatively inelastic demand and the lack of differentiation among producers, which means that agricultural markets are highly competitive. On the supply side, technological improvements, increased competition, reduced protection of markets and devaluation of some national currencies (for example, CFA franc) of many agricultural commodity-producing countries (following structural adjustment programmes) have all contributed to significant increases in production. On the demand side, the development of synthetic substitutes further displace agricultural commodities as intermediate inputs, reducing further the growth in demand.

In the past, these trends have undermined Africa’s trade performance in value terms. For particular countries, these broad trends had a particularly perverse impact. Wuyts (2005), for example, documents that from 1987 to 2001 Tanzania’s overall terms of trade (for goods and services) dropped by nearly 30 per cent, while the terms of trade for goods dropped by nearly 40 per cent. The agricultural terms of trade declined by even more, about 50 per cent. Wuyts (2005:11) concludes that:

“poverty incidence may rise, even if per capita GDP is growing (without adverse changes in income inequality) because declining external terms of trade may offset the gains from increased production.”

None of this is to deny that other developing regions have also had to contend with declining terms of trade. This is, of course, to some extent the inevitable (and desirable) consequence of rising productivity (which, moreover, tends to be higher in the tradeable sector, rather than in non-tradeable, which are less exposed to international competition) which feeds in through in lower unit costs. Thus, countries such as China, which have had an enormous success in expanding labour intensive manufacturing exports have had to face sharply declining export prices, too. An UNCTAD study showed, for instance, that, despite the country’s considerable success in promoting exports, China’s net barter terms of trade (that is, the prices of their exports compared to their imports) in manufactures deteriorated by more than 10 per cent over the period 1993-2000 (Zheng and Yumin, 2002). These countries have been particularly vulnerable to the problems associated with the “fallacy of composition” – the idea that, if a number of developing countries simultaneously try to increase exports in a similar range of product categories, then they may all end up losing through insufficient foreign demand and depressed international prices. However, some countries, such as South Korea, have successfully managed to avoid this dilemma by increasingly shifting production towards higher value-added, technologically more sophisticated, dynamic manufactures. A study by Berge and

Crowe (1997, cited in UNCTAD, 2003:90), for instance, reveals no significant trends in the net barter terms of trade of the Republic of Korea regarding its trade in manufactures with advanced industrial countries, but a significant increase *vis-à-vis* other developing countries and an even greater increase in the income terms of trade, suggesting a relatively successful strategy of diversification into higher value-added products, compared to its less developed trading partners. The tragedy of Africa is, of course, that countries in the continent have not managed a similar transformation. We will discuss briefly why this has not been the case in Section 4.

### 3. Literature Review on the African Supply Side Response to Price Shifts

The literature assessing the price elasticity of production and export – especially in the agricultural sector - mainly focuses on country studies. But doubts have been raised about the reliability of such studies (for example, Mamingi, 1996, Ogbu and Getibuou, 1990). Ogbu and Gebtibouo (1990) argue that the empirical literature on agricultural supply behaviour in SSA is characterised by models that are deficient either in their methodology or in their choice of relevant explanatory variables. This is because the models fail to recognise the structure of agricultural production in these countries and over-simplify the issues and constraints facing farmers. They also criticise the assumption that the binding constraints are uniform across countries. According to Chhibber (1988), cross-country estimations of supply functions suffer from the problem of establishing the direction of causality: the assumption underlying supply functions is that prices influence output or productivity when, in fact, it is possible to argue that high agricultural productivity, which is associated with high *per capita* incomes, may lead to higher price support for agriculture. Ogbu and Gebtibouo (1990) argue that a negative price elasticity is often associated with the target income hypothesis and backward bending supply curve – in other words, producers respond to declines in price by producing more in an attempt to sustain their income levels. They suggest that factors that influence productivity such as technology, fertilizer use, institutional support, access to credit, health services and infrastructure are more likely to influence output supply responsiveness than price. In a review of agricultural supply response studies, Ozanne (1999:64) notes that:

“Empirical results which do not have the ‘correct sign’ tend to be rejected and therefore go unreported in academic publications. The weight of empirical evidence may therefore be misleading and economists and policy-makers alike should be wary of accepting prevailing dogma unreservedly.”

Contributions to the literature on the relationship between prices and volumes, focusing specifically on *aggregate export supply-side functions*, are listed in Annex Table A.8. To summarise some of the findings, in the case of South Africa, Naudé (2000) finds that none of the determinants identified in the literature are significant in explaining South Africa’s export volume. McKay *et al.* (1998) and Cerra and Saxena (2002) base their analyses on price and volume indices. In the case of Tanzania, McKay *et al.* (1998) suggest that agricultural supply response is quite strong, so that the potential for agricultural sector response to liberalisation of agricultural prices and marketing may be quite significant. The long-run elasticity of food crop output to relative prices is almost unity. Both food and aggregate short-run response are estimated at about 0.35. Cerra and Saxena (2002) study the determinants of China’s export volume, with mixed results regarding the influence of price on volumes. To sum up, broadly speaking, despite the misgivings of authors such as Ozanne (1999), previous micro-level studies on agricultural supply side response in SSA tend to show a small positive effect of prices on volume.

### 4. The Role of Trade Policy in Explaining African Export Performance

An important stylised fact, at odds with conventional wisdom, is that African countries are surprisingly open to international trade. Measured by the standard index of “openness” of African economies (*i.e.*, exports plus imports as a percentage of GDP), African countries typically display an openness ratio in the order of 50-60 per cent, comparable to the average of the European Union

countries, and about *three times higher* than that displayed by the world's biggest importer, the United States. This implies that, all African countries could now be considered as "open". And as a recent World Bank study notes:

"tariffs have been falling throughout much of the region over the past decade for capital goods, intermediate goods and total imports. [...]Furthermore, tariff rates do not appear any higher in Africa than in the more successful exporters in East and South Asia" (Clarke, 2005:7).<sup>7</sup>

For SSA countries on average, scheduled tariffs have fallen from 33 per cent in the early 1980s to 15 per cent by 2002 (Morrissey, 2005: 1139).

The majority of SSA countries have implemented significant liberalisation of trade since the 1980s, with reforms mainly related to reducing restrictions on imports (Ackah and Morrissey, 2005). In theory, trade liberalisation reduces relative price distortions, encouraging an expansion of exports, which promotes economic growth. Although the empirical evidence linking trade liberalisation to growth is quite weak (Santos-Paulino, 2002a, 2002b), in SSA, there does appear to have been an export response (relative to GDP): imports have risen fairly slowly and, on average, export growth has tended to match this (Ackah and Morrissey, 2005). There is some evidence that growth has been higher in the more open SSA economies (Onafowora and Owoye, 1998), even those dependent on primary commodity exports (Mbabazi, Milner and Morrissey, 2003). However, as observed above, in SSA, export values tend to be determined externally, by trends in world commodity prices, and export earnings are variable across countries and over time, depending on the commodities that they export (Morrissey, 2005). Countries dependent on primary (agricultural) exports have a limited ability to increase production in response to improved price incentives following trade liberalisation (Mckay, Morrissey and Vaillant, 1997; Noorbakhsh and Paloni, 1998). Furthermore, SSA countries have failed to expand exports of manufactures, largely due to inefficiency and a lack of investment in technology in African manufacturing firms (Söderbom and Teal, 2003). The existence of many fragile states across the continent has compounded all these difficulties.

Consequently, export response to trade liberalisation has been at best slow. Arguably, some of the reforms instigated compounded, rather than alleviated, some of the aforementioned difficulties associated with the declining terms of trade for African exports. In the area of agricultural policy, for instance, during the 1980s and 1990s, much pressure was placed upon African countries to abolish their marketing boards, on the grounds that they distorted price incentives in the agricultural sector, and had been used to "plunder agriculture". By 1992, 16 marketing boards covering cash crops in 23 countries had given up their monopoly positions or had been eliminated (UNCTAD, 1999:ix). Although sometimes corrupt or inefficient, these boards provided information and facilities such as credit and extension services to farmers, and mobilised the country's market power in selling the crop for export. Their elimination has regrettably left farmers vulnerable to the full force of price shocks in commodity markets. An empirical study by Boratav (2001), surveying evidence on 20 Sub-Saharan countries finds that de-regulation has not been associated with improvements in real producer prices or in the terms of trade. In an authoritative account of trends in the cocoa market, ul Haque (2004) documents the decline in cocoa prices subsequent to liberalisation.

Together these stylised facts suggest that the basic problem is not that Africa trades too *little*, nor that the trade regime is excessively closed – rather, that it is trading the wrong kind of products: primary commodities with low valued-added, low prices and a very low elasticity of demand on

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<sup>7</sup> Contrary to this view, some authors argue that the trade regimes of Africa are still extremely restrictive. Using an index of trade restrictiveness, Khandelwal (2004) suggests that only about 9 countries in the Eastern and Southern African region have open trade regimes, and these do not include the relatively developed countries in the region like Kenya or South Africa. Arguably, such a view confuses measurement of the policy environment with the actual outcome – although it is true that significant barriers to trade remain in most African countries, and these are relatively high by world standards, the simple fact that trade represents such a high percentage of GDP suggests that in practice these economies are indeed extremely open. The structural trade deficits which these countries sustain also corroborate the relatively open nature of the trade regimes.

world markets. Expressed alternatively, African producers have been unable to command “rents” from the production of their exports (Kaplinsky, 2005). The question of overcoming Africa’s economic marginalisation is, therefore, essentially *qualitative*, rather than *quantitative*. Seen from this perspective, the low (and decreasing) share of Africa in world trade is merely the outcome of a poor relative economic performance, and is reflected equally in other indicators such as Africa’s declining share of world GDP.<sup>8</sup> In consonance with the analysis of Rodrik (1999) cited earlier, this conclusion is supported by econometric evidence from Coe and Hoffmaister (1998), who estimate a gravity model to address the question of whether Africa’s bilateral trade with the industrial countries is “unusual” compared with other developing country regions. Their main finding is that the unusually low level of African trade is fully explained by economic size, geographical distance, and population; if anything, the average African country tends to “overtrade” compared with developing countries in other regions.

What emerges from this brief review of African trade policies is that countries have been following appropriate trade policies (*i.e.*, export taxes and the most severe quantitative restrictions have been eliminated and tariffs have been reduced) but have not derived a significant benefit. Many reasons can and have been offered to explain this, especially natural barriers, high trade costs, structural characteristics and institutional weaknesses (for example, Morrissey, 2005). Overdependence on a (narrow range of) primary commodity exports has been recognised as a major constraint to export-led growth in SSA, and it is this issue that we now address in more detail.

## 5. Econometric Analysis

The export volume function can be described as follows (Fosu, 2003):

$$VI = f(P, C, U)$$

where *VI* corresponds to export volume, *P* to relative price, *C* the relative production cost and *U* is the perturbation element which includes systematic and random terms. We can identify foreign (f) and domestic (d) determinants:

$$VI = f(P^f, P^d, C^f, C^d, U)$$

The full unbalanced panel includes data for 36 Sub-Saharan African countries over the period 1980-2006 (covering the period of trade reforms and the subsequent commodity price boom). For our own analysis, we estimate the following model, each variable expressed in logs where feasible:

$$VI_{i,t+1} = \epsilon + \alpha_1 VI_{i,t} + \alpha_2 P_{i,t} + \alpha_3 DW_{i,t} + \alpha_4 TD_{i,t} + \alpha_5 Z_{i,t} + \alpha_6 F_{i,t} + \alpha_7 T_{i,t} + \epsilon_{i,t}$$

where *VI* is specifically the volume index of exports and *P* is the unit price index for exports taken from the UNCTAD Handbook of Statistics 2008.<sup>9</sup> The other control variables of our model were chosen to reflect better world demand, *DW*, domestic export distortions, *TD*, and supply-side capacity, *Z*, of the African economies under analysis. First, world demand is proxied by imports from High-income OECD Countries (World Development Indicators), which is expected to affect export volumes of African countries positively. Second, domestic export distortions are measured by REER, the real effective exchange rate, which assumes value 100 in the base year 2002 (International Finance Statistics). A depreciation of the REER (decrease in the real interest rate) is supposed to influence export competitiveness positively. Supply-side capacity is expressed by the following variables: *GDP per capita* in Local Currency Unit is used as a proxy for average productivity rates of labour (World Development Indicators) and *FDI stock* as a percentage of GDP (UNCTAD Handbook of Statistics 2008) tries to capture the growing involvement of multinationals in export-commodity

<sup>8</sup> For instance, with over 11 per cent of the world’s population, Sub-Saharan Africa has barely one per cent of world’s GDP (UNCTAD Handbook of Statistics, 2005). This pattern is repeated in areas like FDI, where Africa’s share of total does not reach more than around 1 per cent of total inflows. See Mold (2004).

<sup>9</sup> Both indices are based on 2000 reference year, *i.e.* for the year 2000 the index equals 100.



chains and the exploitation of natural resources. By using a lead dependent variable, all explanatory variables are effectively lagged with the exception of the proxy for average labour productivity. In order to investigate whether fragile countries present different behaviour in terms of export response, we consider an interaction term  $F_{it}$  between the unit price index and a dummy variable that takes value 1 in the case of a fragile country. Specifically, a country is defined as *fragile* once it meets at least one of the fragility criteria presented in the ERD Outline Report.<sup>10</sup>  $T_{it}$  is an interaction factor between the unit price index and a time dummy which takes value one in the period 2002-2006 of high commodity prices. Finally,  $\varepsilon_{it}$  corresponds to the sum of the country-specific term and the disturbance term.

**Table 2: GMM Estimation on Export Volumes**

Dependent variable	Exports Volume Index (1)	Exports Volume Index (2)
Volume Index	0.83*** (237.95)	0.71*** (28.24)
Unit Price Index	0.23*** (42.43)	0.12 (1.14)
OECD Income		0.05** (2.24)
REER		-0.11*** (-3.23)
GDP per capita (+1)		0.56*** (5.22)
FDI Stock		0.07*** (2.98)
Fragility interaction factor	-0.25*** (-44.33)	-0.30*** (-2.91)
Time interaction factor	0.02*** (12.19)	0.01 (1.41)
Number of observation	1076	724
J-stat	42.12	26.35
S.E. of regression	0.3046	0.3070

Notes: t-statistics are reported under parenthesis. The levels of significance are as follows: \*\*\* 99 per cent level, \*\*95 per cent level, \*90 per cent level.

Given potential endogeneity problems, we estimate the reduced form dynamic panel using a GMM estimator (Arellano and Bond, 1991; Arellano and Bover, 1995). In the Annex we include the fixed-effects estimation for robustness checks, being aware of the biased co-efficient of the lagged dependent variable implied by this technique. Table 2 provides the main results.

### **5.1 Discussion of the Results**

Results of estimation (2) in Table 2 are suggestive, showing volume export performance to be highly ambiguous with respect to price: positive, but not significant. This conclusion is re-inforced by the fact that nor is the time interaction factor significant, suggesting no response to the strong prices of the post 2002 period. All the other variables are significant and of the expected signs. Average productivity, as proxied by GDP *per capita*, makes the largest impact on volumes. FDI stock is a significant determinant, in line with the view that FDI in SSA has traditionally been attracted to export activities (usually in the extractive sector) as the economies are mainly too small for market-

<sup>10</sup> The list of fragile countries is included in Annex A.4. The criteria are the following: LICUS (low-income country under stress), countries with a *stateness* score in Bertelsmann Index lower than 7, Failed State Index above 90, countries that fell into the bottom two CPIA quintiles (2003-2005-2006) and proxy list of fragile states provided by DFDI (2005).

seeking FDI. World demand (proxied by OECD imports) also plays a small, but positive, significant role in explaining export volumes. Consistent with the idea that overvalued exchange rates detract from export performance, REER exerts a significant negative impact on export volumes. Most importantly from the point of view of the ERD project, the fragility interaction factor is significant and negative, reflecting the special difficulties that fragile states encounter in terms of their ability to sustain their export performance.

These results lead to an obvious question about why the response from rising commodity prices has been so ambiguous and is not picked up by our interaction dummy. A number of explanations are plausible:

1. As mentioned earlier, price rises have been concentrated disproportionately on certain products. It means little for countries whose major export items have been little affected by these trends (for example, tea in Kenya) or has experienced price movements for its own reasons, quite independently of any other markets (such as vanilla in Madagascar) (Lines, 2008:62).
2. Another possibility is that African exporters themselves have not been benefiting fully from the price rises. The argument has been made forcefully by Gibbon and Ponte (2005), and Kaplinsky (2005) among others: growing market concentration among purchasers means that markets behave more like monopsonies than competitive markets, and increases in market prices are not fully passed on to producers.
3. Another explanation is the way in which prices have been calculated. As commodity prices are typically denominated in dollars, their price increases are smaller in the currencies that appreciate against that currency. If the price increase is smaller in the currency of a commodity importing country, the demand response will also be smaller than in the absence of a dollar depreciation (UNCTAD Trade and Development Report, 2008b:22). That has, indeed, been the case in the last two-three years, as the US real exchange rate has declined.

## 6. Conclusions

The objective of this study has been to analyse the fundamental determinants of African trade performance. It has been argued that, by focusing excessively on export values, a rather misleading impression has been given of African performance. This paper brings to light some important, and often overlooked, characteristics to the determinants of African exports.

Firstly, the impression created that African export performance in the 1990s was largely unsatisfactory is not correct. If by an unsatisfactory trade performance, we mean the apparent inability to move rapidly into new, high-value added, dynamic products, then African countries clearly failed. But, if we mean the capacity of African countries to expand their existing range of exports, then the argument is not so clear. Many African countries increased the volume of exports quite significantly during the reform period from the mid-1980s onwards.

Secondly, for a multitude of reasons, African economies have not benefited as much as would be expected from the commodity price boom – in the period since 2002, the volume of exports have increased at a rate which has actually been slower than during the previous period of two decades of low and declining prices. Indeed, our econometric evidence would seem to suggest that export performance has been largely indifferent to price developments, and is more likely to be affected by policies which stimulate overall productivity and investment. Stabilising fragile states would also seem to be a priority if African countries are to become better integrated into the global economy.

Finally, our analysis drives home the important point that it is not sufficient to export greater volumes – what matters is the ability to capture “rents”, in the Schumpeterian sense.<sup>11</sup> Even if the

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<sup>11</sup> See Kaplinsky (2005:Chapter 3) for a discussion of this issue.

income terms of trade are positive, if technical progress is low in primary production, then growing export quantities may have high opportunity costs in resource terms. This means that the resources devoted to the production and export of these commodities could be used more effectively in other sectors (Kaplinsky, 2005:58). All this puts the importance of export diversification to the forefront. It must be noted that what diversification that has taken place in Sub-Saharan Africa took place before the period of reforms in the 1990s,<sup>12</sup> and the subsequent commodity price boom has only consolidated trends towards greater concentration on primary exports. One positive consequence of the recent slump in commodity prices is that it will surely help focus minds once again on the need to diversify.

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<sup>12</sup> See World Bank (2005: Table 3.6).

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## Appendix

**Table A.1. UNCTAD Export Volume Indexes of Export for African Countries 1990-2002**

(100 = year 1990) Source: Calculated from UNCTAD Handbook of Statistics, 2004

	1990	1994	1998	2002
Equatorial Guinea	100.0	185.7	1100.0	3442.9
Mozambique	100.0	152.4	266.7	923.8
Lesotho	100.0	207.4	311.1	800.0
Uganda	100.0	320.0	390.0	580.0
Sudan	100.0	225.0	187.5	550.0
Central African Republic	100.0	258.8	394.1	476.5
Mali	100.0	128.6	214.3	364.3
Seychelles	100.0	84.4	190.6	362.5
Burundi	100.0	170.6	185.3	297.1
Guinea Bissau	100.0	545.5	218.2	290.9
Zimbabwe	100.0	147.8	178.3	267.4
Guinea	100.0	112.5	160.7	250.0
United Republic of Tanzania	100.0	144.9	146.9	244.9
Senegal	100.0	128.9	195.6	233.3
Ethiopia	100.0	132.1	149.1	228.3
Burkina Faso	100.0	78.8	240.4	219.2
Congo	100.0	120.8	211.3	203.8
Togo	100.0	177.4	188.7	203.8
Tunisia	100.0	144.6	162.5	200.0
Morocco	100.0	143.9	166.7	187.7
Ghana	100.0	158.2	167.3	185.5
Cape Verde	100.0	69.2	161.5	180.8
Swaziland	100.0	121.1	146.5	180.3
Kenya	100.0	163.5	150.8	177.8
Mauritius	100.0	110.3	125.3	164.4
Botswana	100.0	104.8	112.7	160.3
South Africa	100.0	109.1	128.8	157.6
Benin	100.0	160.9	131.9	153.6
Namibia	100.0	135.9	140.6	146.9
Algeria	100.0	97.0	122.4	143.3
Zambia	100.0	84.9	145.2	138.7
Cote d'Ivoire	100.0	89.6	129.9	136.4
Mauritania	100.0	119.8	91.9	133.7
Cameroon	100.0	77.6	105.6	126.4
Comoros	100.0	107.0	30.4	124.0
Malawi	100.0	112.6	131.0	123.0
Dem Rep of the Congo	100.0	46.3	41.2	118.4
Madagascar	100.0	131.6	128.1	103.5
Gabon	100.0	138.9	137.0	101.9
Nigeria	100.0	96.4	128.6	95.2
Sao Tome and Principe	100.0	106.8	91.4	87.0
Egypt	100.0	61.4	52.8	86.6
Chad	100.0	99.0	120.2	85.9
Rwanda	100.0	21.9	39.7	54.2
Gambia	100.0	114.4	61.7	39.4
Sierra Leone	100.0	42.7	0.4	1.9

**Table A.2. UNCTAD Export Volume Indices of Export for African Countries 2002-2006**

(100 = year 2002). Source: Calculated from UNCTAD Handbook of Statistics, 2008

	2002	2003	2004	2005	2006	2007
Chad	100.0	260.6	747.1	766.7	694.9	704.8
Sierra Leone	100.0	171.2	225.4	248.4	308.7	369.9
Uganda	100.0	117.2	137.4	141.9	146.8	216.0
Lesotho	100.0	132.9	198.2	181.5	190.2	206.7
Burkina Faso	100.0	104.4	156.0	157.6	181.9	188.3
Angola	100.0	99.0	107.8	137.9	151.7	177.2
Namibia	100.0	113.6	151.8	153.1	160.8	175.9
Mauritania	100.0	91.2	113.7	106.8	194.0	175.5
Equatorial Guinea	100.0	114.3	145.1	151.4	154.5	173.4
Tunisia	100.0	113.4	130.9	131.5	138.5	166.2
Zambia	100.0	94.8	115.1	108.0	133.1	164.9
Guinea-Bissau	100.0	116.0	122.6	138.3	117.6	163.2
Swaziland	100.0	155.1	174.0	165.6	161.4	162.2
Libyan Arab Jamahiriya	100.0	119.3	115.9	137.4	155.5	158.5
Mozambique	100.0	120.0	148.8	145.3	155.8	158.4
Ethiopia	100.0	94.7	113.7	128.9	142.0	155.1
Sudan	100.0	109.1	130.5	118.1	118.0	155.0
Egypt	100.0	117.8	119.1	130.3	140.5	153.5
Ghana	100.0	129.9	145.4	138.7	160.3	151.2
Malawi	100.0	127.9	114.0	110.6	126.1	149.4
Rwanda	100.0	89.8	124.9	106.9	114.1	127.7
Kenya	100.0	105.6	105.4	110.9	110.0	127.1
Congo, DRC	100.0	117.9	145.1	135.9	121.1	122.4
Cape Verde	100.0	118.5	139.6	132.4	138.8	119.7
Botswana	100.0	107.9	125.3	151.0	137.8	117.9
Nigeria	100.0	111.5	125.3	127.9	117.3	117.7
Morocco	100.0	95.8	95.9	98.6	107.9	117.3
Mauritius	100.0	121.7	117.3	127.8	141.6	116.6
South Africa	100.0	96.2	101.4	106.5	103.1	112.7
United Republic of Tanzania	100.0	111.6	121.1	126.6	108.5	112.3
Gabon	100.0	102.3	104.2	113.2	105.9	112.0
Congo	100.0	101.2	101.4	102.5	119.4	110.9
Côte d'Ivoire	100.0	105.5	121.4	114.1	112.0	105.3
Senegal	100.0	110.5	120.9	109.4	98.4	101.9
Madagascar	100.0	92.0	106.2	85.6	92.9	101.8
Benin	100.0	97.7	102.6	108.1	97.6	98.8
Seychelles	100.0	113.5	104.2	100.8	107.3	97.8
Central African Republic	100.0	85.5	79.2	78.5	93.7	95.7
Algeria	100.0	96.8	105.5	106.7	98.2	93.1
Burundi	100.0	106.4	120.3	116.2	96.6	91.0



**Table A.3. Country composition of Regional Areas**

<b>Eastern Africa</b>	<b>Southern Africa</b>	<b>Central America</b>	<b>South Eastern Asia</b>
Burundi	Botswana	Belize	Brunei Darussalam
Comoros	Lesotho	Costa Rica	Cambodia
Djibouti	Namibia	El Salvador	Indonesia
Eritrea	South Africa	Guatemala	Lao People's Democratic Republic
Ethiopia	Swaziland	Honduras	Malaysia
Kenya	<b>Western Africa</b>	Mexico	Myanmar
Madagascar	Benin	Nicaragua	Philippines
Malawi	Burkina Faso	Panama	Singapore
Mauritius	Cape Verde	<b>South America</b>	Thailand
Mayotte	Côte d'Ivoire	Argentina	Timor-Leste
Mozambique	Gambia	Bolivia	Viet Nam
Rwanda	Ghana	Brazil	<b>Western Asia</b>
Seychelles	Guinea	Chile	Bahrain
Somalia	Guinea-Bissau	Colombia	Iraq
Uganda	Liberia	Ecuador	Jordan
Tanzania	Mali	Falkland Islands (Malvinas)	Kuwait
Zambia	Mauritania	Guyana	Lebanon
Zimbabwe	Niger	Paraguay	Occupied Palestinian territory
<b>Middle Africa</b>	Nigeria	Peru	Oman
Angola	Saint Helena	Suriname	Qatar
Cameroon	Senegal	Uruguay	Saudi Arabia
Central African Republic	Sierra Leone	Venezuela (Bolivarian Republic of)	Syrian Arab Republic
Chad	Togo	<b>Eastern Asia</b>	Turkey
Congo	<b>Caribbean</b>	China	United Arab Emirates
Congo, DRC	Anguilla	Korea, Dem. Rep.	Yemen
Equatorial Guinea	Antigua and Barbuda	Mongolia	
Gabon	Aruba	Republic of Korea	
Sao Tome and Principe	Bahamas	<b>Southern Asia</b>	
<b>Northern Africa</b>	Barbados	Afghanistan	
Algeria	British Virgin Islands	Bangladesh	
Egypt	Cayman Islands	Bhutan	
Libyan Arab Jamahiriya	Cuba	India including Sikkim	
Morocco	Dominica	Iran (Islamic Republic of)	
Sudan	Dominican Republic	Maldives	
Tunisia	Grenada	Nepal	
	Haiti	Pakistan	
	Jamaica	Sri Lanka	
	Montserrat		
	Netherlands Antilles		
	Saint Kitts and Nevis		
	Saint Lucia		
	Saint Vincent and the Grenadines		
	Trinidad and Tobago		

**Table A.4. Samples**

<b>UNCTAD Database</b>			
Angola	Côte d'Ivoire	Kenya	Senegal
Benin	Congo DRC	Lesotho	Seychelles
Botswana	Equatorial Guinea	Madagascar	Sierra Leone
Burkina Faso	Ethiopia	Malawi	South Africa
Burundi	Gabon	Mauritius	Sudan
Cameroon	Gambia	Mozambique	Togo
Central African Republic	Ghana	Niger	Uganda
Chad	Guinea	Nigeria	Tanzania
Congo	Guinea-Bissau	Rwanda	Zambia
<b>Fragile countries</b>			
Angola	Congo	Liberia	Sao Tome and Principe
Benin	Congo DRC	Malawi	Sierra Leone
Burundi	Ethiopia	Mali	Somalia
Cameroon	Gambia	Mauritania	Sudan
Central African Republic	Guinea	Niger	Togo
Chad	Guinea-Bissau	Nigeria	Uganda
Comoros	Kenya	Rwanda	Zimbabwe

**Table A.5. Variables**

<b>Variable</b>	<b>Description</b>	<b>Source</b>
Volume_UNCTAD	Export Volume Index (100=yr2000)	UNCTAD Handbook of Statistics
Price_UNCTAD	Export Unit Price Index (100=yr2000)	UNCTAD Handbook of Statistics
OECD Import	Imports in USD High Income OECD Countries	World Development Indicators
REER	Real Effective Exchange Rate (100=yr2000)	International Finance Statistics
GDPCAP	GDP per capita (LCU)	World Development Indicators
FDI	Foreign Direct Investment (Inward) as a percentage of GDP	UNCTAD Handbook of Statistics

**Annex A.6. Some Methodological Clarifications**

What economic meaning can be attached to the country-wide volume and unit price data indices reported in Section 2? The volume index for exports is calculated according to the Laspeyres formula as base-period-weighted averages and the unit price index represents the familiar Paasche index as current-period-weighted averages. The price index  $P_{nc,t} = \frac{\sum_{i=1}^n P_{ni,t} Q_{ni,t}}{\sum_{i=1}^n P_{ni,t_0} Q_{ni,t_0}}$  and  $P_{n0}$  are the prices of commodity  $Q_{nc}$  and  $Q_{n0}$  are the quantities of commodity  $Q_{nc}$  are determined by ratio of the values of individual commodities to the total value of the group measured in current prices  $\sum_{i=1}^n P_{ni,t} Q_{ni,t}$ . The volume index (VOI) of a commodity group is a measure of the change in its value, which may be solely attributed to variations in the quantities of the individual commodities. The volume index is equal to:

$$VOI = \frac{\sum_{i=1}^n P_{ni,t} Q_{ni,t}}{\sum_{i=1}^n P_{ni,t_0} Q_{ni,t_0}}$$

where  $P_{nt}$  is the price of commodity  $n$  at time  $t$ ,  $T$  is the number of commodities,  $Q_{nt}$  and  $Q_{n0}$  are the quantities of commodity  $n$  at time  $t$  and 0, respectively. The unit value indices<sup>13</sup> are estimates of the unit values of total exports or imports from groups of countries in any given period, relative to the unit values of those exports or imports in a pre-determined based year. Similarly, the volume indices are estimates of the volume of total exports, by the same group of countries, in any period, relative to the volume of those exports in the base period.

### A.7. Fixed-effects Estimations

Dependent variable	Exports Volume Index	Exports Volume Index
Volume Index	0.90*** (56.27)	0.76*** (28.09)
Unit Price Index	0.06 (1.11)	-0.12 (-1.51)
OECD Imports		0.13*** (3.36)
REER		0.01 (0.50)
GDP <i>per capita</i> (+1)		0.41*** (5.94)
FDI Stock		0.06*** (3.54)
Fragility interaction factor	-0.04 (-0.63)	-0.01 (-0.50)
Time interaction factor	0.01* (2.14)	0.00 (-0.27)
Number of observation	1121	759
Adjusted R-squared	0.903172	0.920647
S.E. of regression	0.300192	0.298887
F-statistic	218.643	210.3856
Prob(F-statistic)	0.0000	0.0000

Notes: t-statistics are reported under parenthesis. The levels of significance are as follows: \*\*\* 99 per cent level, \*\*95 per cent level, \*90 per cent level.

<sup>13</sup> See Methods used in compiling the United Nations price Indexed for External Trade Volume II

**Table A. 8. Literature review on the price elasticity of export and supply functions**

	<b>Countries</b>	<b>Period</b>	<b>Scope and Methodology</b>	<b>Main Findings</b>
Bond (1983)	6 SSA countries: Ivory Coast, Kenya, Malawi, Ghana, Sudan and Tanzania	1954-56 1964-66 1975-77	<u>Scope:</u> Analysis of responsiveness of individual crop output (acreage under cultivation) to prices (real producer price) <u>Methodology:</u> Econometric <u>Technique:</u> OLS	<ul style="list-style-type: none"> <li>- Both aggregate crop production and individual crops supply responses are positive</li> <li>- For individual crops price elasticity tends to be larger in the long rather than in the short-run</li> <li>- For aggregate crop there appear to be some evidence that farmers do respond to aggregate real producer prices.</li> <li>- No evidence for target- income hypothesis</li> </ul>
Balassa (1988)	53 developing countries	1965-82 (divided in two sub-periods) 1965-73 1974-82 (period of high versus period of low growth)	<u>Scope:</u> Analysis of price incentives to agricultural and total exports <u>Methodology:</u> Econometric <u>Technique:</u> OLS	Total and agricultural exports are responsive to price incentives in SSA.
Ogbu and Gbetibouo (1990)			<u>Scope:</u> Critical review of the empirical literature on the behaviour of agricultural supply in SSA	<ul style="list-style-type: none"> <li>- Binding constraints are not uniform across countries.</li> <li>- Cross-country estimation of supply functions suffers from the problem of establishing the direction of causality. The assumption underlying supply functions is that prices influence output or productivity, when, in fact, it is possible to argue that high agricultural productivity, which is associated with high per capita incomes, may lead to higher price support for agriculture.</li> <li>- The negative price elasticity is often associated with target income hypothesis and backward bending supply curve. While this is theoretically plausible from the work-leisure trade-off point of view, in the case of many SSA countries it can only be argued for the specific case of migrant seasonal workers or legislation concerning sale of labor services and can hardly be generalised.</li> <li>- The ability and willingness of a producer to react to favourable price changes or improved technology will depend on her/his ability to export as well as on land availability and farm-labour wage structure.</li> <li>- Factors that influence productivity such as technology, fertiliser use, institutional support, access to credit, health services, infrastructure, are more likely to influence output supply responsiveness to price.</li> </ul>

Gabriele (1994)	Costa Rica, El Salvador, Guatemala, Honduras	1960-1990	<p><u>Scope:</u> Estimation of price elasticity of Central America agricultural exports</p> <p><u>Methodology:</u> Simplified linear regression models with output prices as the only relevant explanatory variable for four crops bananas coffee sugar and cotton</p>	No significant statistical relation is found between production and price in the cases of bananas and sugar, while cotton production appears to react to a certain extent only to year-to-year price changes.
McKay, Morrissey, Vaillant (1998)	Tanzania	1964-1990	<p><u>Scope:</u> Analysis of the supply response of agricultural output in Tanzania</p> <p><u>Methodology:</u> ECM</p>	<p>- Agricultural supply response is high. Potential for agricultural sector response to liberalisation of agricultural prices and marketing may be quite significant.</p> <p>- Long-run elasticity of food crop output to relative prices is almost unity. Both food and aggregate short-run response was estimated at about 0.35.</p>
Naudé (2000)	South Africa	1974-1988	<p><u>Scope:</u> Analysis of the determinants of South African Exports</p> <p><u>Methodology:</u> ECM</p>	None of the determinants identified in the literature was found to be significant in explaining South Africa's export volume.
Cerra and Saxena (2002)	China	Mid1980s-2001	<p><u>Scope:</u> Analysis of the determinants of China's export volume</p> <p><u>Methodology:</u> FE, 2SLS, Dynamic OLS adjusted for serial correlation and cross-sectional heterogeneity</p>	Mixed results. However, regressions using aggregate export price and quantity indices clear indicate that export suppliers have increasingly behaved according to predictions of economic theory based upon market economy. In particular, the price elasticity of supply has become positive and increased over time, paralleling reforms in 1988 and 1991.
Edwards and Alves (2006)	South Africa	1982-99 1970-99 1980-99	<p><u>Scope:</u> Analysis of determinants of South Africa Manufacturing Export Performance</p> <p><u>Methodology:</u> <u>Dynamic Fixed effect model GMM difference and system</u></p>	Exporters are responsive to policies and economic environments that raise the probability of export supply. Scope for policy makers to enhance substantially South Africa's manufacturing export performance.

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