



## **Protectionist Policies and Manufacturing Trade Flows in Africa**

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## **Abstract**

The declining share of Africa in world trade is well known. The policy prescriptions, however, vary widely and cover tariff liberalisation, policies to facilitate output growth, and improvements in trade-related infrastructure and institutions. This study engages in this debate. It presents a comparative analysis of trade performance and tariff liberalisation in Sub-Saharan African countries since the early 1990s. It also estimates the contribution of tariff liberalisation to manufacturing export growth in African and other developing economies during the 1990s using sector-level data and direct measures of tariff protection. Three key results emerge: Firstly, African countries continue to be marginalised in world trade despite considerable tariff liberalisation in many of these countries. Second, tariff liberalisation has had a statistically significant and positive effect on manufacturing trade flows, but its contribution to overall growth in trade has been small. Africa is no different from other developing countries in this regard. Thirdly, tariff liberalisation is not associated with a worsening manufacturing trade balance. Increased imports are countered by growth in exports. Tariff liberalisation, particularly on key inputs, needs to be combined with complementary policies that reduce trade costs in Africa.

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# **Protectionist Policies And Manufacturing Trade Flows In Africa**

## **Introduction**

The marginalisation of Africa in world trade is well known. Early evidence from a World Bank programme of research in the mid-1990s (Amjadi and Yeats 1995; Amjadi and others 1996; Ng and Yeats 1996) found that Sub-Saharan Africa's (SSA) share of world trade declined dramatically from more than 3 percent in the 1950s to less than 1 percent in the early 1990s (Ng and Yeats 1996).

Alternative views exist as to the source of this decline and the consequent policy recommendations. In the first view, Africa has been marginalized from world trade because of domestic policy distortions that have led to high international transport costs (Amjadi and Yeats, 1995) and high tariff and non-tariff barriers (Amjadi and others 1996; Ng and Yeats 1996). Internal transport costs and delays have also been identified as severe constraints to African exports (Djankov and others 2006). The policy conclusion is that trade liberalisation including de-regulation of transport would substantially enhance African trade flows.

An alternative view is that Africa trades as much as, or even more than, can be expected given the underlying determinants of trade, such as per capita income, geography and size (Foroutan and Pritchett 1993; Rodrik 1997). Measured by standard indices of 'openness' (e.g. exports plus imports as a percentage of GDP), Africa countries display an openness ratio in the order of 50 – 60 percent, which is comparable to European economies and substantially higher than the US (Morrissey and Mold 2006).

Trade barriers do restrict trade, but Africa's marginalization in world trade is primarily due to the region's low per capita income and disadvantageous geography

(Rodrik 1997). The implication is that policies that stimulate African growth will also raise Africa's contribution to world trade. These policies do not preclude tariff reform, including the de-monopolization trade, avoidance of extreme tariff variation and excessively high effective rates of protection, the implementation of transparent customs procedures, etc., but these reforms are auxiliary to other growth policies dealing with human resources, infrastructure, macroeconomic stability and rule of law (Rodrik 1997).

A related concern is the effect of trade liberalisation on the trade balance. Rather than enhancing growth, if liberalization raises the growth of imports, an external constraint may well inhibit it. Cross-country studies of developing countries, including Africa, have suggested that such concern is in order (UNCTAD 1999; Santos-Paulino and Thirwall 2004). Exports grew, but only moderately relative to imports.

Finally, there is growing evidence that direct trade policy instruments make up a small proportion of overall trade costs that include costs associated with transport infrastructure investment, law enforcement and related property rights institutions, informational institutions, regulation and language (Anderson and Van Wincoop 2004).<sup>1</sup> Policy reform in the area of trade-related infrastructure and trade facilitation may therefore be greater than through tariff liberalisation (Wilson and others 2005). Such policy reform may also be more attractive to governments than tariff reform, which in many economies is politically controversial and is dependent on the slow multilateral process.

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<sup>1</sup> Anderson and Van Wincoop (2004) estimate that the *ad valorem* equivalent of direct policy barriers (tariff and non-tariff barriers) in industrialized countries is 8 percent compared to 170 percent for total trade costs. Trade costs in developing economies are higher, but the contribution of direct tariffs to these costs is also small.

This paper engages in this debate in two ways. Firstly, it presents a comparative analysis of trade performance and trade liberalization in Africa during the 1990s. This was a period of considerable tariff reform for many developing and middle-income economies as they implemented multilateral tariff reductions agreed to in the Uruguay round of the GATT (now WTO) and increasingly entered into preferential trade agreements. How Africa fared relative to its counterparts is explored.

Second, it estimates the contribution of tariff liberalisation to changes in trade flows in Africa and other developing economies between 1990 and 2004. This includes an investigation of the effect of trade liberalization on manufacturing exports, imports and the trade balance. This empirical analysis makes a number of contributions to the existing literature: (a) the effect of liberalisation is measured using direct measures of tariff protection and complexity and not with a dummy variable like many other studies; (b) the sectoral composition effects of liberalisation are captured using disaggregated trade and protection data for 28 manufacturing sectors; and (c) alternative measures of the anti-export bias are included to better capture the effect of trade liberalisation on export performance.

There is further reason why this analysis is useful. Multilateral tariff reform has slowed in response to the lack of progress in the Doha Round of the WTO. One of the major sticking points in the negotiations is the failure to find common ground on the removal of subsidies and protection granted to agricultural producers in Europe, Japan and the USA.

The contest for many developing economies is about market access into these economies. While improved market access to developed countries has been shown to increase exports from Africa and other developing countries (Hoekman and others

2002; Collier and Venables 2007); further gains are limited by the already low tariffs imposed on developing country exports (Amjadi and others 1996). The policy question is increasingly whether to pursue liberalization unilaterally or through preferential trade agreements. A deeper understanding of how developing economies responded to liberalization from the early 1990s should contribute towards future trade policy formulation.

The paper is structured as follows: Section 2 reviews the existing empirical literature on the effect of trade barriers on trade performance in developing economies. This is followed in Section 3 by a comparative analysis of trade flows and trade reform in Africa and other developing economies from the early 1990s. Section 4 presents various estimates of the relationship between trade liberalisation and manufacturing exports, imports and the trade balance for 51 economies including 31 developing economies (11 African), over the period 1990 to 2004. A summary of the key findings and some policy recommendations are provided in the conclusion.

### **Trade Barriers And Trade Performance In Developing Economies**

The earlier World Bank study by Ng and Yeats (1996) argued that domestic trade barriers and high tariffs on key inputs contributed significantly towards the marginalization of Africa in world trade. Various studies have subsequently evaluated this through econometric estimation.<sup>2</sup>

Rodrik (1997) estimates cross-country and pooled regressions for 37 SSA countries over the period 1964-94. His results indicate that the restrictiveness of trade policies correlates strongly with the volume and growth of trade flows (total trade and exports) in African economies. A reduction in trade taxes by 10 percentage points is

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<sup>2</sup> See Santos-Paulino (2005) for a review of studies relating to Africa and other developing economies.

estimated to increase the share of trade in GDP in SSA countries by 17 percentage points (Rodrik 1997: 12). According to World Development Indicator data, the average ratio of taxes on international trade (export taxes plus import taxes) to imports plus exports of goods and services, ranged from 9 to 16 percent between 1990 and 2006. Rodrik (1997) estimates suggest that full liberalisation would raise trade (exports plus imports) to GDP ratios by 12 to 26 percentage points; a large increase given the average trade to GDP ratio of 65 to 85 percent over this period. To this extent his results are consistent with those of Ng and Yeats (1996).

However, Rodrik (1997) argues that per capita income and geography are more important factors explaining trade flows. His estimates show that Africa trades as much as can be expected given its geography and per-capita income.<sup>3</sup> The marginalization of Africa in world trade is primarily the consequence of relatively poor per-capita income growth.

Other studies have explored the effect of liberalisation on exports, imports and the trade balance. Santos-Paulino and Thirwall (2004) estimate import and export growth functions for a pooled sample of 22 developing countries covering the mid - 1970s to late 1990s. Import duties are found to have a negative impact on import growth: a one percentage point reduction in import duties is estimated to raise import growth by 0.2 percentage points. For exports, their GMM estimates show a small negative effect of export duties on export growth (1 percentage point reduction in duties raises export growth by 0.16 percentage points). However, the contribution of these variables to export and import growth implied by their results is very small.

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<sup>3</sup> The gravity models of Foroutan and Pritchett (1993) and Coe and Hoffmaister (1998) give consistent results. Foroutan and Pritchett (1993), for example, find that intra-African trade in manufactures in the early 1980s is unusually high relative to low- and medium-income countries given Africa's characteristics. A recent extension of this work by Subramanian and Tamirisa (2003) finds consistent results for Anglophone Africa, but not for Francophone Africa which is found to undertrade relative to predictions.

Average import and export duty rates across all countries in their sample fell by less than 3 percentage points. Using their estimated coefficients, this would have raised export and import growth by approximately 0.5 percentage points.

By far the largest impact on growth in trade volumes is attributed to the liberalisation dummy variable for the period of significant trade liberalisation. This variable suggests that liberalisation raised growth of imports by 6.19 percentage points and export growth by 1.56 percentage points. In addition, liberalisation is found to increase the sensitivity of import growth and export growth to both price and income changes. They conclude from these results that virtually the whole of the increase in trade growth post-liberalisation can be attributed to trade reform.

These relationships also hold for Africa. In their disaggregated analysis by region (Africa, East Asia, South Asia and Latin America), they find a stronger effect of liberalisation in Africa on import growth (8.4 vs. 6.19 percentage points) and export growth (3.58 vs. 1.56 percentage points). African exports, however, are not found to be sensitive to export duties and the income and price elasticity of demand for exports do not increase after liberalisation.

Santos-Paulino and Thirwall (2004) also investigate the effect of trade liberalisation on the trade balance in developing economies. This is an ambiguous relationship as it is dependent on the change in exports relative to imports. They regress the trade balance as a share of GDP on world income growth, domestic income growth, terms of trade, the change in the real exchange rate and various protection variables (export duties, import duties and a dummy variable for the period of liberalisation). Liberalisation is found to be associated with a worsening trade balance in developing economies. A 1 percentage point reduction in import duties worsens the trade balance by roughly 0.8 percent of GDP, while a 1 percentage point

reduction in export duties improves the trade balance by 0.2 percent of GDP. The effect of liberalisation captured through the dummy variable for the liberalisation period is much stronger and is estimated to have worsened the trade balance by over 2 percent of GDP. This effect is found in all the regions analysed (Africa, East Asia, South Asia and Latin America).

Similar results are found by UNCTAD (1999) in their analysis of the trade balance in 16 countries over the period 1970-95. This study also uses a dummy variable for the period of liberalisation, which in this case includes capital account liberalisation and import liberalisation. Liberalisation periods are associated with reductions in the trade balance of approximately 2.8 percent of GDP, which is close to the result found by Santos-Paulino and Thirwall (2004). Liberalisation is also shown to increase the sensitivity of the trade balance to domestic growth, growth rate of industrial countries and the purchasing power of exports.

Other studies find mixed results. Parikh and Stirbu (2004), for example, find lots of variation in their estimates of the trade balance for developing economies over the period 1970-99. Of the 29 developing countries for which significant results are obtained, 10 experience an improvement in the trade balance as share of GDP, while the remainder experience worsening trade balances.

There are a number of serious limitations with these studies. The first limitation is that most empirical studies in this field estimate the effect of liberalisation on trade flows using a dummy variable for the period of trade reform (Papageorgiou and others 1991; Greenaway and Sapsford 1994; Bleaney 1999; UNCTAD 1999; Santos-Paulino and Thirwall 2004). This is problematic for a number of reasons.

Trade liberalisation periods are frequently accompanied by numerous other policy reforms, including capital account liberalisation. The coefficient on the dummy variable measures the cumulative effect of all these policies and not just that of tariff liberalisation. This may actually bias estimates of export growth downwards and that of import growth upwards if improved confidence in the country leads to capital inflows and an appreciation of the currency, as was experienced in a number of developing countries (Bleaney 1999; UNCTAD 1999). The appreciation would have offset the reduction in the anti-export bias from liberalisation leading to far lower exports than would have been anticipated.

Dummy variables also do not adequately account for variations in the pace and depth of trade liberalization across countries. Reductions in protection are often phased in over a long period and involve reform of a wide range of policy instruments including quotas, export subsidies, export taxes, market control boards, the real exchange rate, etc. Defining the commencement of the liberalisation period depends crucially on the definition of liberalisation taken and what aspects of the reform process are emphasised (Santos-Paulino, 2005).

A second limitation is that the mechanisms through which liberalisation influences trade flows, particularly exports, are not adequately specified in the trade functions estimated. A key mechanism through which trade liberalisation enhances export growth is through reductions in the cost of import-competing inputs. Lower input costs from liberalisation, whether from lower costs of direct imports or of import-competing products, is expected to raise export volumes by improving the profitability of export production. This is expected to be particularly important for manufactured products as these use a high proportion of intermediate and capital goods in the production process relative to goods produced in the primary sector. The

fragmentation and global outsourcing of production processes also requires manufacturing firms to be integrated into global value chains, which in turn requires access to imported intermediate inputs.

This channel through which trade liberalization affects exports, namely through a reduction in the cost of intermediate inputs, is not well explored in much of the empirical literature in this field. The available evidence suggests that the effects on export volumes can be large.

Collier and Venables (2007) use a difference-in-differences approach to estimate the effect of the African Growth and Opportunity Act (AGOA) on African exports to the US from 2000. SSA exports of apparel to the US quadrupled from \$400 million 1995 to \$1.6 billion 2005 in response to the implementation of AGOA. Their estimates suggest that the waiver on the rule of origin on textile inputs for some SSA countries is a significant source of this growth. For South Africa, Edwards and Lawrence (2006) find that reductions in input costs from liberalisation contributed significantly to improved export growth, particularly of non-commodity manufactures. Their analysis of the determinants of export orientation covers 44 manufacturing sectors from 1990 to 2002.

This leads to the fourth limitation. Trade liberalization has non-uniform effects across sectors of the economy. The export sector consists of heterogeneous firms and industries and the effect of liberalization on export performance is expected to differ amongst them. Yet, the bulk of the studies, the cross-country studies in particular, analyse aggregate export performance. Important sectoral variations in the composition of exports are therefore missed. As shown by the results of Collier and Venables (2007) for African clothing exports and Edwards and Lawrence (2006) for non-commodity manufactures in South Africa, these composition effects matter. It

could be extremely misleading to draw implications from the aggregate cross-country studies about the likely impact of liberalisation on developing economies without taking account of structural and compositional differences between countries. Countries could well differ in the nature of their trade regimes, the extent of liberalizations and their responsiveness to liberalizations. There is a need, therefore, to supplement cross-sectional evidence with in-depth case studies.

### **Trade Policy Reform And Trade Performance In Africa From The Early 1990s**

This section briefly evaluates Africa's export performance and trade policy reform in the 1990s. This provides the background to the empirical analysis that focuses on the effect of trade policy reform from the 1990s on trade flows in developing economies and Africa in particular.

#### *Export Performance*

The source of Africa's marginalization in world trade prior to the 1990s was two pronged – “*it experienced declining market shares for its major exports which, in turn, were of declining relative importance in world trade*” (Ng and Yeats 1996:8). This section provides an updated analysis of export performance in Sub-Saharan African countries from 1990 to 2002 using UN Comtrade data at the SITC (Revision 2) 3-digit level. Only countries for which data are available in both periods are included in the analysis. Where home country reported data are unavailable, mirror export data are used. Home reported export data for most SSA countries is notoriously poor (Yeats 1990) and mirrored export data was used instead.<sup>4</sup> This data are valued in c.i.f. prices, not f.o.b. prices and will thus inflate the level of SSA trade, but not necessarily the change in value.

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<sup>4</sup> An exception is South Africa where export data from South African Customs and Excise are used.

Unreliable data over time also resulted in various SITC 3-digit categories being excluded from the analysis.<sup>5</sup> The only excluded categories to have a significant impact are 323 (coal briquettes; coke and semi-coke; lignite or peat; retort carbon), 333 (crude petroleum and oils obtained from bituminous minerals) and 334 (petroleum products, refined). Exports from oil exporting economies are thus under-reported.

In total 102 countries are included in the sample. Africa is well represented with 34 SSA countries and 4 North African economies included. Together these countries account for over 90 percent of the total available value of exports in 2002. All data are measured in current US dollars.

Table 1 presents export shares and growth rates for SSA and country aggregates defined according to the World Bank's income group categorisation.<sup>6</sup> South Africa is separated from the rest of SSA given its economic size in the region. The export data are presented according to a technology based classification developed by Lall (2000).

Three main points stand out regarding trade flows between 1990/01 and 2001/02. First, average annual growth of SSA exports in current US\$ (1.7 percent for SA and 2.8 percent for rest of SSA) was lower than growth in world exports (5.2 percent) and substantially lower than growth in low-income and middle-income economies (5.6 percent to 10.5 percent). As a consequence, SSA share of world exports declined from 0.8 percent to 0.5 percent for South Africa and 1.3 percent to 1 percent for the rest of SSA (Table 2). The decline was far more drastic when looking

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<sup>5</sup> These are: 286 (ores and concentrates of uranium), 323 (coal briquettes; coke and semi-coke; lignite or peat; retort carbon), 333 (crude petroleum and oils obtained from bituminous minerals), 334 (petroleum products, refined) and 688 (uranium depleted in u235).

<sup>6</sup> Economies are divided according to 2006 GNI per capita. The groups are: low-income, \$905 or less; lower-middle-income, \$906 - \$3,595; upper-middle-income, \$3,596 - \$11,115; and high-income, \$11,116 or more.

at SSA's share of exports by low-income and middle-income economies. SA and the rest of SSA share in total exports by these income groups declined by more than half; from 5.5 to 2.5 percent for SA and 9.5 to 4.8 percent for the rest of SSA.

Second, the relatively poor performance in part arises from SSA's concentration in products that experienced poor growth in world trade. SSA exports are highly concentrated in primary products and resource based manufactures. These sectors accounted for 65 percent of SA exports and 92 percent of the rest of SSA exports in 2001/2. World growth in primary products and resource based manufactures lagged those of other sectors and their combined share of world trade declined from 32 percent to 28 percent during the period.<sup>7</sup>

However, as found by Ng and Yeats (1996) declining competitiveness is also a factor. SSA excluding SA experienced declining shares in world trade for almost all the aggregated product groupings presented in Table 2. The exception is the low technology sector where the share of SSA in world trade rose from 0.28 percent to 0.3 percent. This growth is largely driven by the Fashion cluster, which includes clothing and textiles and most likely reflects the effect of preferential access to the US market under the African Growth and Opportunities Act (AGOA) (Collier and Venables 2007). However, this growth has been insufficient to offset a decline in SSA's share of developing country trade, even in this sector.<sup>8</sup>

The strongest indication of competitiveness problems or export supply constraints in SSA is the decline in its share of primary products and resource based manufactures in world exports. These are sectors in which SSA traditionally has had a

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<sup>7</sup> Over a longer period, the share of primary products in world trade declined from just over 25 percent in 1980 to just under 15 percent in 2000 (Lall 2005). The share of resource based products in world trade declined from 18 percent to 15 percent over this period.

<sup>8</sup> Lesotho and Swaziland which experienced high growth in clothing exports to the US under AGOA are not included in the sample. Further, the period analysed does not capture the acceleration in growth of exports under AGOA after 2002.

comparative advantage. South Africa's share of world exports of primary products almost halved, largely as a result of the decline in gold exports. The rest of SSA share in world exports of primary products declined 6.3 to 5.8 percent.

**Table 1: Export performance by income category and technology classification**

	Share structure of SSA exports		Average annual growth of export value (US\$)						
	South Africa	SSA excl SA	South Africa	SSA excl SA	Low income	Lower middle income	Upper middle income	High income: OECD	Total
	2001-02		1990-01 to 2001-02						
Total Trade	100.0	100.0	1.7	2.8	5.6	10.5	9.2	4.2	5.2
Primary products	45.1	79.9	-1.9	2.8	3.4	3.8	3.2	2.9	3.5
Total Manufacturing	54.7	20.1	6.5	2.6	7.9	13.2	12.2	4.3	5.5
Manufacturing sub-sectors									
<i>Resource-based</i>	20.0	11.9	5.3	2.9	7.0	7.9	6.4	3.4	4.1
RB1: Agric-based	7.5	6.9	4.3	2.2	5.4	7.7	6.8	2.9	3.6
RB2: Minerals-based	12.5	5.0	5.9	3.8	7.8	8.1	5.9	3.9	4.7
<i>Low technology</i>	8.2	3.4	2.9	5.2	8.3	11.1	10.7	2.9	4.5
LT1: Fashion cluster	2.2	2.8	4.9	5.1	7.4	9.5	10.0	1.8	4.1
LT2: Other	6.0	0.6	2.3	5.8	13.8	14.9	11.5	3.5	4.8
<i>Medium technology</i>	24.0	3.8	9.1	-0.7	7.4	13.0	13.2	4.0	4.8
MT1: Automotive	7.0	0.1	20.1	3.1	8.2	6.7	18.2	4.8	5.4
MT2: Process	9.8	1.1	3.8	-1.2	9.3	9.8	7.3	3.3	4.1
MT3: Engineering	7.2	2.6	13.5	-0.7	5.1	16.9	14.2	3.7	4.6
<i>High technology</i>	2.5	0.9	11.1	-0.6	9.7	25.6	20.6	6.8	8.7
HT1: Electronic	1.5	0.1	12.0	9.3	13.2	26.8	21.5	6.6	9.2
HT2: Other	1.0	0.8	9.9	-4.3	7.9	16.7	15.6	7.2	7.6
Special	0.2	0.1	9.5	22.1	17.7	15.3	10.4	1.8	2.4
Number of countries			1	33	32	25	16	22	102

Source: Own calculations using UN Comtrade data.

Growth rates are calculated using the total value of trade by country group and product group. Growth rates for the median and mean economy may therefore differ.

**Table 2: Sub-Saharan African shares of world trade and developing country trade**

	Share world trade		Share developing country trade	
	South Africa	SSA excl SA	South Africa	SSA excl SA

	1990-91	2001-02	1990-91	2001-02	1990-91	2001-02	1990-91	2001-02
Total Trade	0.77	0.53	1.32	1.02	5.51	2.48	9.46	4.76
Primary products	3.06	1.71	6.28	5.81	8.67	4.86	17.77	16.51
Total Manufacturing	0.31	0.34	0.32	0.24	3.18	1.77	3.31	1.23
Manufacturing sub-sectors								
<i>Resource-based</i>	<i>0.67</i>	<i>0.76</i>	<i>1.00</i>	<i>0.88</i>	<i>4.44</i>	<i>3.69</i>	<i>6.62</i>	<i>4.28</i>
RB1: Agric-based	0.54	0.58	1.11	0.96	3.61	2.70	7.51	4.51
RB2: Minerals-based	0.82	0.93	0.88	0.80	5.31	4.72	5.70	4.05
<i>Low technology</i>	<i>0.34</i>	<i>0.29</i>	<i>0.28</i>	<i>0.30</i>	<i>1.94</i>	<i>0.88</i>	<i>1.59</i>	<i>0.92</i>
LT1: Fashion cluster	0.17	0.18	0.51	0.56	0.61	0.39	1.85	1.21
LT2: Other	0.48	0.37	0.09	0.10	5.21	1.67	0.95	0.44
<i>Medium technology</i>	<i>0.25</i>	<i>0.39</i>	<i>0.15</i>	<i>0.08</i>	<i>4.40</i>	<i>3.03</i>	<i>2.57</i>	<i>0.63</i>
MT1: Automotive	0.09	0.37	0.02	0.01	2.25	3.73	0.45	0.14
MT2: Process	0.76	0.73	0.18	0.10	8.15	4.99	1.91	0.68
MT3: Engineering	0.10	0.25	0.21	0.12	2.02	1.76	4.16	0.83
<i>High technology</i>	<i>0.04</i>	<i>0.06</i>	<i>0.08</i>	<i>0.03</i>	<i>0.89</i>	<i>0.30</i>	<i>1.51</i>	<i>0.15</i>
HT1: Electronic	0.04	0.05	0.02	0.02	0.62	0.20	0.30	0.07
HT2: Other	0.06	0.08	0.20	0.05	1.97	1.20	6.37	0.84
Special	0.07	0.15	0.09	0.60	2.70	1.90	3.20	7.48

Source: Own calculations using UN Comtrade data.

A complementary perspective can be obtained through a constant-market-shares analysis of export growth in each region where the change in exports between the two periods is ascribed to growth in world exports, favourable or unfavourable structural concentration on products and changes in relative competitiveness (Richardson 1971). The decomposition is presented in Table 3.

If SA and the rest of SSA had held its market shares, the total value exports would have been 74 percent higher. Instead, the value of exports for the region rose by less than half of this value: 20 percent for SA and 35 percent for the rest of SSA. A substantial part of this shortfall can be attributed to the fact that the region's export structure is more concentrated in products that grew relatively slowly during this period. Declining competitiveness, measured in effect by declining market share, also contributed to the shortfall, reducing exports by 13 percent for SA and 11 percent for the rest of the region. The region has also been characterised by limited re-structuring

of exports towards rapidly growing products. As shown in point 6 in the Table, rising export shares in growing products raised exports for the lower-middle income group by 47 percent, compared to 2 percent for SA and -3 percent for the rest of SSA.<sup>9</sup>

The trends in SSA trade identified by Ng and Yeats (1996) in the 3 decades prior to 1990 have been replicated in the period subsequent to this.

**Table 3: Constant market shares analysis of total trade, 1990/01 to 2001/02**

	High income: non OECD	High income: OECD	Low income	Lower middle income	Upper middle income	South Africa	SSA excl SA
<b>All products (US\$)</b>							
1. Total change	32,599	1,380,342	77,888	355,333	486,177	4,818	14,296
2. Product composition	-122	44,727	-19,870	-41,198	16,464	-9,757	-11,419
3. Competitiveness	20,269	-462,938	30,007	233,273	179,389	-3,107	-4,503
4. World growth	12,452	1,798,553	67,751	163,258	290,323	17,682	30,217
5. Initial trade	16,824	2,429,930	91,535	220,570	392,241	23,889	40,825
<b>As percentage initial trade</b>							
1. Total change	194%	57%	85%	161%	124%	20%	35%
2. Product composition	-1%	2%	-22%	-19%	4%	-41%	-28%
3. Competitiveness	120%	-19%	33%	106%	46%	-13%	-11%
4. World growth	74%	74%	74%	74%	74%	74%	74%
6. Competitiveness in growing commodities	53%	-9%	12%	47%	23%	2%	-3%

Source: Own calculations using UN Comtrade data at the 3-digit SITC level and initial period shares as weights. See Richardson (1971) for the method and some of the shortfalls of the approach.

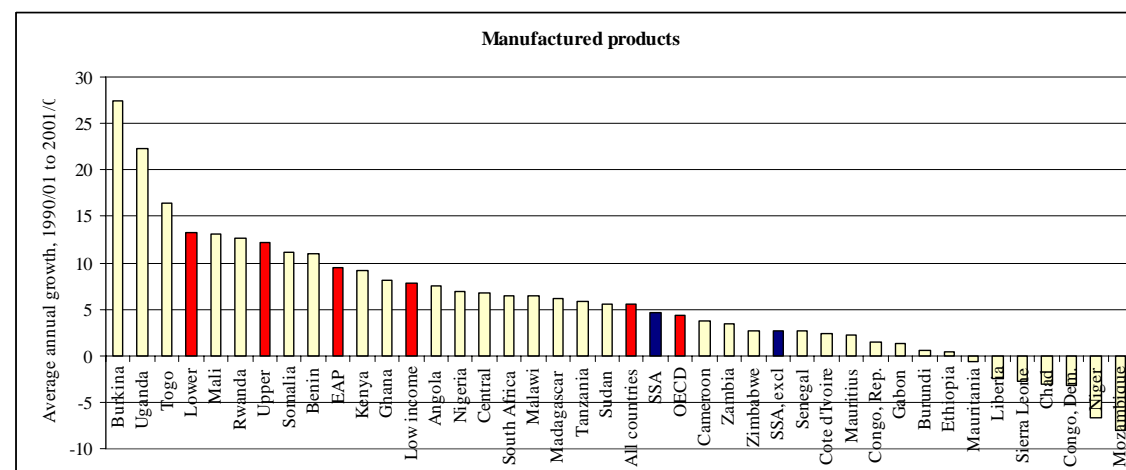
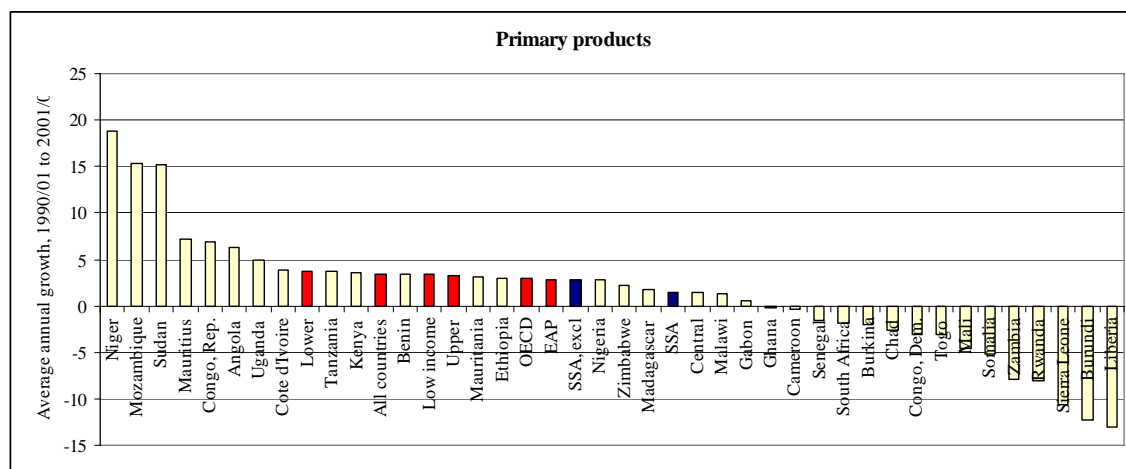
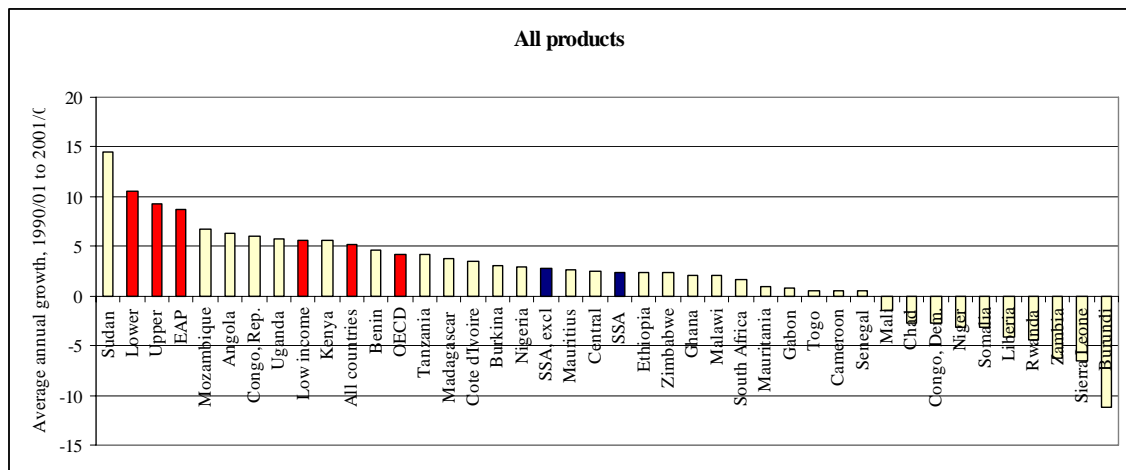
The third point is that export performance was relatively poor across most SSA countries. Figure 1 presents average annual growth rates in exports of all products, primary products and manufactured products for SSA countries. The average growth rates for OECD, East Asia & Pacific, low-income and middle-income countries are also presented for a comparative perspective.

Growth in total trade exceeded world growth in only 6 out of 34 SSA economies. Very poor export growth is experienced in a wide range of SSA

<sup>9</sup> The decomposition was also conducted for manufacturing alone. A key difference in the results is that improved competitiveness in SA raised manufacturing exports by 62 percent. Competitiveness problems remained in the rest of SSA, which reduced exports by 3 percent.

economies, but most of these have been severely affected by civil conflict during the 1990s (Somalia, Liberia, Burundi, Rwanda, Sierra Leone). SSA export performance looks marginally better if analysed in terms of primary and manufactured products. 10 SSA economies experienced higher than world average growth in exports of primary products. The relevant number for manufactures is 17. In some of these economies growth in export values of primary products and resource based products was impressive, exceeding 10 percent per annum (Niger, Mozambique and Sudan for primary products; Benin, Burkina Faso, Chad, Mali, Rwanda, Togo and Uganda for manufactured products.)

**Figure 1: Sub Saharan export growth by country, 1990/91 – 2001/02**



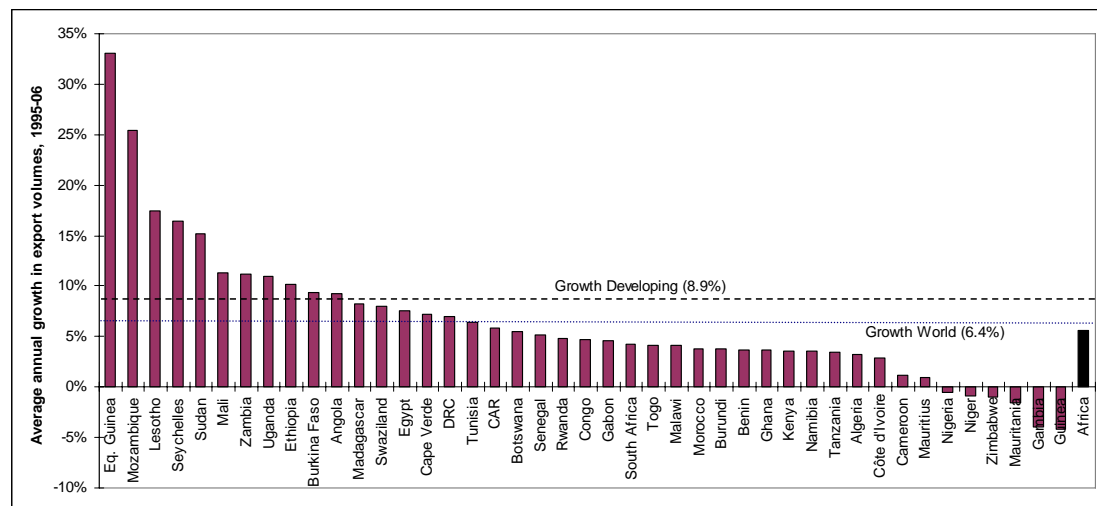
Source: Own calculations using UN Comtrade data.

A key limitation of the above comparison is that it is based on the US dollar value of exports and may therefore not be representative of growth in export volumes. Morrissey and Mold (2006), for example, argue that Africa exports perform relatively well when analysed in terms of volumes. This point is re-evaluated using export

volume data obtained from UNCTAD Handbook of Statistics (2007). The data covers the period 1995 to 2006 and therefore includes the export volume effects from the recent commodity price boom. The growth rates for each country including the country groups are presented in Figure 2.

Aggregate export volumes for Africa grew at 5.6 percent per annum between 1995 and 2006. This is substantially lower than aggregate export growth for developing countries (8.9 percent) and for the world (6.4 percent). Relatively weak growth is experienced in many of the SSA countries. Export growth exceeded the world average in only 16 of the 43 African economies (15 of the 39 SSA countries) and was higher than the average for developing countries in only 11 cases (all SSA). Thus in both volume and value terms, SSA exports have under performed relative to other developing economies.

**Figure 2: Average annual growth in export volumes, 1995-2006**



Source: UNCTAD Handbook of Statistics, 2007

### Tariff Reform

The 1990s were a period of considerable trade reform as countries reduced MFN tariffs in accordance with their offers made under the Uruguay Round and

increasingly participated in preferential trade agreements. This section briefly reviews the extent to which developing economies liberalized their trade regimes. Particular focus is placed on trade reform in Africa relative to other economies.

Comparisons of protection across countries are fraught with difficulties. Different economies use a wide range of policy instruments to influence trade flows including tariff barriers (*ad valorem* tariffs, specific tariffs, compound tariffs, mixed tariffs that include specific and *ad valorem* rates, etc.), non-tariff measures (quotas, government procurement requirements, voluntary export restraints, standards), export subsidies and taxes, import rebates, etc. Obtaining the relevant data for these measures over a period time is enormously difficult. Further, the calculation of *ad valorem* equivalent for the many non-tariff measures requires detailed data on domestic and international prices that are often unavailable. Then there is the problem of aggregation as tariff data are provided at detailed product level. Both simple average tariffs and import weighted tariffs can produce biased estimates of average protection. Alternative methods to produce unbiased estimates, such as the Trade Restrictiveness Index of Anderson and Neary (1994) have been developed and estimated for various countries (Anderson 1998; Kee and others 2006), but these are not available for a wide range of years.

Nonetheless, an evaluation of protection using nominal tariff data is possible and allows for an instructive comparative analysis of trade reform across countries. To pursue such an analysis, detailed country level tariff data are obtained from TRAINS for the period 1990 to 2006. This data include Most Favoured Nation (MFN) rates and applied tariffs that include lower tariffs under preferential trade agreements. An important limitation of this data is that it does not include *ad valorem* equivalents for non-*ad valorem* tariff rates. This will mainly affect agriculture where non-*ad*

*valorem* tariffs are used extensively, but this limitation remains an important caveat affecting the interpretation of the results and the data.

Import weighted average tariffs for each country are calculated for the periods 1990-95 and 2004-06. The extent of liberalization is measured as the percentage change in the tariff-inclusive border price and is calculated as  $(t_1 - t_0) / (1 + t_0)$  where  $t_1$  and  $t_0$  refer to tariffs the final and initial periods, respectively.<sup>10</sup>

To ensure the comparison of protection is conducted over a consistent set of countries, only those countries in which average protection in both periods can be calculated are included.<sup>11</sup> This resulted in 115 countries made up as follows: low-income (27), lower-middle-income (34), upper-middle-income (31), high-income non-OECD (14) and OECD (11). The sample includes 29 African countries.

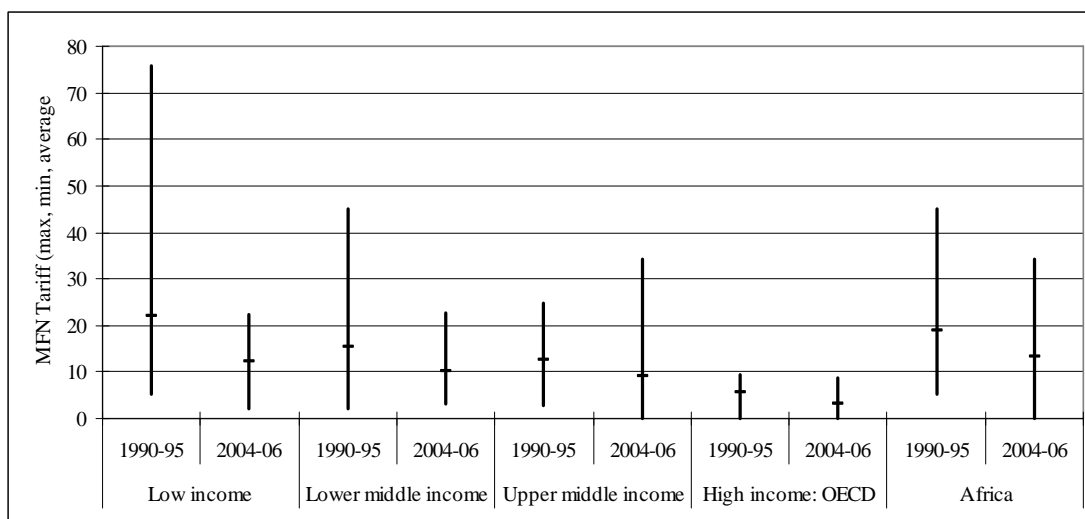
Figure 3 presents the maximum, minimum and simple average MFN tariff for the various country groups. The simple average rather than the import weighted average of the corresponding measure for the individual countries is presented. This avoids domination by any individual country (e.g. South Africa in Africa, India in low-income, China in lower-middle-income). The country level tariff is the import weighted average of all products.

**Figure 3: Maximum, minimum and average country tariff by region and period, MFN tariffs**

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<sup>10</sup> The implication is that an equivalent 'x' *percentage point* decline in tariffs will result in a relatively large decrease in protection in countries with relatively low initial tariff rates. Further, an equivalent 'y' *percent* decline in the tariff rate, will lead to a relatively large decrease in protection in countries with relatively high initial tariff rates.

<sup>11</sup> To maximise the number of available countries, the average for 1996-2000 instead of 1990-95 is used for 38 of the countries and data for 2001-03 instead of 2004-06 is used for 11 of the countries.



Notes: 115 countries for which data are available for both periods

Source: TRAINS and own calculations.

Four main observations can be drawn from the data.

First, there has been a considerable reduction in average MFN tariffs by income group from 1990. Relatively large decreases in the average MFN tariff were experienced in low-income economies (22 to 12.3). The average change in tariffs for these economies is equivalent to a decrease in the tariff inclusive border price of 6.2 percent. Middle-income economies experienced slightly lower declines in MFN protection (2.9 to 4.1 percent reduction), although the initial tariffs were far lower than in low-income economies.

MFN tariffs have also fallen in African economies despite limited offers made in the Uruguay round to reduce bound rates. The decline in protection is roughly equivalent to middle-income economies, but is more moderate compared to the average low-income economy. The average MFN tariff in Africa fell from 19 to 13 percent and the average country experienced a 4.8 percent decline in the tariff-inclusive border price.

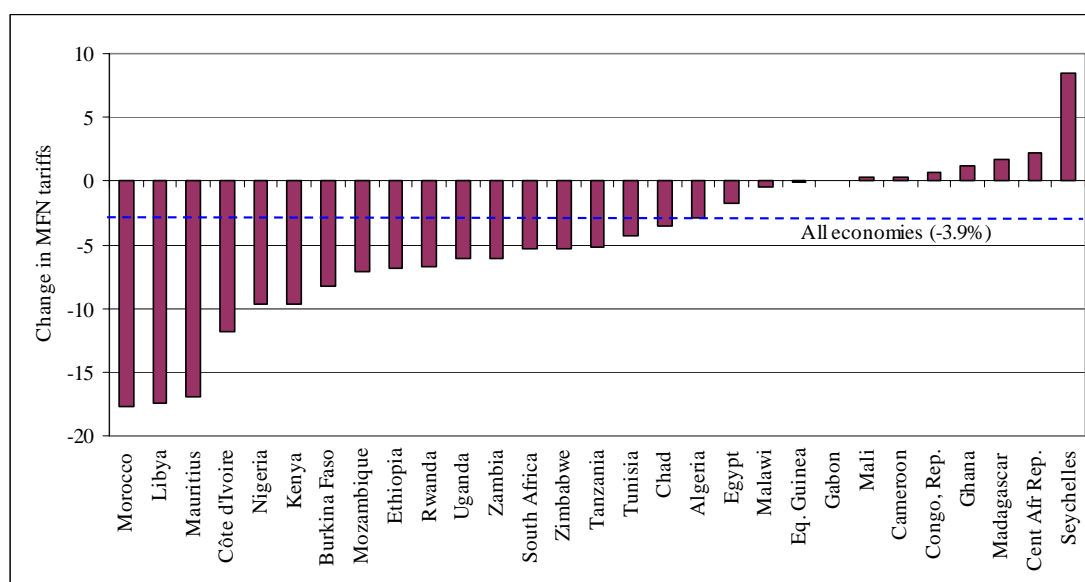
Second, there is substantial variation in the extent of tariff liberalization across countries. The range of average tariffs across countries is clearly shown in Figure 3,

which displays the maximum and the minimum country level tariff. In almost all groupings, including Africa, the spread of tariff rates across countries declined over the sample period. The narrowing of the range is greatest for low-income countries as a result of substantial reductions in the average tariff in Bangladesh which fell from 76 to 18.2 percent over the period.

The extent of liberalization across African economies also varies widely.

Figure 4 presents the percentage change in the tariff-inclusive price from MFN liberalization for African economies. Large decreases (greater than 10 percent) in the import weighted average MFN tariff are found in Morocco, Libya, Mauritius and Côte d'Ivoire. These economies had average protection rates in excess of 20 percent and up to 45 percent in the case of Morocco in 1990-91. By 2004-06 average protection had fallen to 19 percent in the case of Morocco, 12 percent for Nigeria and less than 10 percent for the others.

**Figure 4: Change in import weighted MFN tariff by African economy**



Source: TRAINS

Protection also rose in a number of African economies, with particularly large increases (above 5 percent) for Seychelles. Smaller increases were experienced in Ghana, Madagascar and Central African Republic. Some of this reflects changes in tariff rates, but changes in the composition of import weights and the tariffication of non-tariff barriers also affects the average. Nevertheless, over half (16) of the 29 African economies experienced tariff reductions greater than the simple country average of all 115 countries in the sample (3.9 percent). This indicates that many African economies have opened up considerably from the early 1990s.

This leads to the third point. The relatively large decline in average tariffs for some African economies reflects tariff liberalization from high levels of protection in the early 1990s. The scope for liberalization and the subsequent impact on tariff-inclusive prices (1+tariff) was therefore far greater for these economies. The average level of MFN protection at 13.1 percent for African economies in 2004-06 remains relatively high compared to low-income (12.3 percent), middle-income economies (9.2 to 10.2 percent) and OECD countries (3.1 percent) (Table 4). This is also the case at the disaggregated country level (see Table A in the Appendix). Average protection exceeds the simple country average of all low-income and middle-income economies (10.5 percent) in 19 of the 29 African economies in the sample.<sup>12</sup>

The focus has up to now been on MFN rates. Table 4 also presents data on the level and change in applied tariffs that include preferences granted under the various preferential trade agreements. The data shows more extensive liberalization from the

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<sup>12</sup> According to 2006 tariff data obtained from the *WTO World Tariff profiles* (WTO 2006), SSA countries on average have lower binding coverage (50.6 percent of lines vs. 82 percent for all countries), higher bound rates (60 percent vs. 35 percent for all countries); a lower proportion of lines subject to duty-free rates (15.2 percent vs. 23.4 percent) and a higher proportion of international tariff spikes (tariff lines with duties > 15 percent) (37.6 percent vs. 20.4 percent). In other dimensions, the structure of tariffs is far simpler in Africa than in other developing economies. The average number of tariff lines is lower; there are far fewer distinct duties (51 vs. 412) and the proportion of tariff lines with non-*ad valorem* rates is a quarter of the average for all countries (0.5 vs. 2 percent).

early 1990s in response to the implementation of various preferential trade agreements during this period. Current applied rates are also lower than MFN rates. The difference however, does not appear substantial and does not alter any of the conclusions drawn on the basis of the MFN rates.<sup>13</sup>

The aggregate data also hides much variation in protection at the sector level. Of particular interest to this paper is the extent to which liberalization reduces the cost of accessing key intermediate inputs. To evaluate this, Table 4 presents the simple average tariff and change in tariff on consumer, intermediate and capital goods for SSA and income groupings. The end-use categorization is based on the Broad Economic Categories (BEC) classification available from UN Statistics. Passenger vehicles (BEC 51) are included as a separate item as they are both an intermediate good and a final consumer good.

**Table 4: Simple average protection by end-use**

	Capital goods			Consumption goods			Intermediate goods			Passenger vehicles			Total		
	1990-	2004-	%	1990-	2004-	%	1990-	2004-	%	1990-	2004-	%	1990-	2004-	%
	95	06	change	95	06	change	95	06	change	95	06	change	95	06	change
<b>Mean import weighted tariff, MFN</b>															
Low-income	19.4	8.6	-7.7	28.6	18.4	-7.0	20.4	11.4	-6.6	48.9	28.2	-11.1	22.1	12.3	-7.3
Lower-middle	13.2	6.7	-5.3	21.3	17.4	-2.6	13.9	8.7	-4.2	41.9	28.2	-6.5	15.3	10.2	-4.1
Upper-middle	11.5	6.0	-4.7	17.6	15.5	-1.9	10.3	6.3	-3.6	32.4	23.9	-4.9	12.6	9.2	-2.9
OECD	4.6	1.6	-2.9	9.9	5.8	-3.7	4.2	2.2	-1.9	9.4	5.7	-3.2	5.8	3.1	-2.5
Africa	16.2	8.0	-6.6	25.3	21.6	-2.5	17.2	11.1	-5.0	43.3	25.3	-11.1	19.0	13.1	-4.8
<b>Simple average applied tariff</b>															
Low-income	18.6	8.2	-7.5	27.0	16.4	-7.4	19.3	9.7	-7.2	47.1	27.2	-10.6	21.0	10.8	-7.6
Lower-middle	12.7	6.0	-5.5	20.4	14.7	-4.0	13.3	7.1	-5.1	40.7	25.5	-7.4	14.7	8.6	-5.0
Upper-middle	11.3	4.6	-5.7	17.1	12.4	-4.2	10.1	4.4	-5.1	32.3	18.4	-9.3	12.3	7.0	-4.7
OECD	3.9	1.2	-2.6	8.0	4.4	-3.3	3.4	1.8	-1.6	9.0	4.9	-3.6	4.7	2.4	-2.2
Africa	16.1	7.7	-6.8	24.8	20.0	-3.4	16.8	9.4	-6.0	43.2	24.9	-11.3	18.7	11.8	-5.6

Source: Own calculations using TRAINS data

The data shows that the decline in tariffs from the early 1990s in African countries has been concentrated in capital and intermediate inputs with very little

<sup>13</sup> As noted earlier, preferential agreements in the early 1990s may not be adequately captured (Nicita and Olarreaga 2006)

liberalization of tariffs on consumer goods (25.3 to 21.6 percent). This will have raised effective protection on consumer goods in many of the African countries. High MFN tariffs on intermediate and capital goods in African economies (11.3 and 8 percent, respectively) continue to tax production and impose a barrier to exports, particularly of manufactured goods where inputs constitute a relatively high proportion of overall production costs.

In some African countries, exporters have access to import duty rebate schemes which is supposed to offset the negative effect on production costs arising from tariffs on inputs. However, the administrative burden of using these schemes is often high. For example, South African export firms are required to directly import the input and ensure a clear audit trail which often requires storage in separate warehouses. This imposes costs on these producers, but more importantly imposes an additional fixed cost on producers who wish to enter the export market. Further, for firms that are more reliant on domestic inputs or who purchase imported intermediate goods from retail agents, tariffs on inputs continue to discourage exports. The proportion of SA firms, particularly small firms, using these schemes is therefore low (Chandra and others 2001). The World Bank Investment Climate surveys analysed by Clarke (2005) reveal a similarly low utilisation of available duty drawback schemes by exporters in Africa: Ethiopia (37 percent), Kenya (10 percent), Mali (35 percent), Mozambique (6 percent), Senegal (49 percent), Tanzania (19 percent), Uganda (31 percent) and Zambia (56 percent).

### *Summary*

In conclusion, Africa presents a mixed picture with regards to trade flows and liberalization during the 1990s. Export performance has generally been poor and the share of SSA in world trade continued to decline from 1990, whether measured in

value or volume terms. This largely reflects a concentration in products that have experienced relatively poor world growth, but declining 'competitiveness' has also contributed to the decline. The outcome is therefore similar to that found by Ng and Yeats (1996) for the period prior the early 1990s.

There are exceptions to the poor export growth performance. Growth in primary products was high in Burundi, Mozambique, Sudan and Mauritius, although in almost all cases this was off a very low base. Manufacturing export growth was relatively high (greater than 12 percent per annum) in Burkina Faso, Uganda, Togo, Mali and Rwanda. In most cases, however, export growth was relative weak.

In terms of protection, SSA economies have made reasonable progress in reducing MFN rates and simplifying their tariff structure. The extent of tariff liberalisation exceeded the world average for over half of the African countries analysed. However, liberalization was off a high initial base and average tariffs remain relatively high, even on key intermediate and capital inputs. These continue to pose a barrier to export growth.

### **Econometric Analysis Of The Effect Of Tariff Barriers On Manufacturing Trade In Developing Economies**

This section, estimates the impact of tariff liberalisation from 1989 to 2004 on manufacturing exports, imports and the trade balance in African and other developing countries. The focus on manufacturing trade in part reflects data constraints regarding the availability of tariff data for primary sectors over time. However, there are additional reasons why such a focus is of importance.

Growth in manufacturing is closely associated with growth accelerations in developing countries including those in Sub-Saharan Africa (Pattillo and others 2005; Johnson and others 2007). The potential for output growth in manufacturing

production is often greater than for agricultural and resource-based exports which encounter diminishing returns to scale due to limited endowments (Collier and Venables 2007). Production of manufacturing is also more likely to be characterised by positive externalities, backward and forward linkages and learning by doing. Diversification into manufacturing production also helps insulate resource based economies from volatile natural resource prices and politically and economically disruptive rent-seeking behaviour (Sachs and Warner 1999). Finally, manufactured exports are likely to grow faster than primary exports as the global economy expands as their income elasticity of demand is higher (Elbadawi 2001).

This does not imply that improved economic growth cannot or should not be achieved through expansion of primary product exports, as has been achieved in, for example, Chile. The recent commodity price boom driven in part by growth in China provides an important opportunity for African economies to expand trade in primary commodities. However, continued growth in manufactures will form part of the overall strategy to improve economic growth. Mayer and Fajarnes (2008) for example, note that income growth in SSA that is high enough to achieve the internationally agreed development goals, will be associated with a nine-fold increase in SSA's manufactured exports.

### *Data*

The main database used is the Trade, Production and Protection database produced by Nicita and Olarreaga (2006). This database provides data on trade flows, tariff protection and industrial production for 28 three-digit ISIC (Rev. 2) manufacturing sectors. The tariff measures include the simple average and import

weighted average applied and MFN tariff, the maximum and minimum tariff and the standard deviation of tariffs. The primary source of the tariff data is TRAINS.

This paper draws on a sample of 31 developing countries (of which 7 are from SSA and 4 are from North Africa) and 20 developed economies over the period 1989-2004. The selection of the countries included in the sample is based on the availability of tariff data. Countries were only included if at least 6 years (4 years for African countries) of tariff data were initially available in the period 1989-2004. To ensure as much coverage as possible, the MFN tariff data were then updated using HS 6-digit level tariff schedules obtained from the country pages on the WTO web site. Tariff data for South Africa for the entire period was constructed using data presented in Edwards (2005). Tariffs for missing periods that were bounded by available tariff data in the previous and subsequent year were interpolated using simple averages. Overall this led to an average of 10 years of tariff data available for each developing country.

There are some important limitations with this database (Nicita and Olarreaga 2006). The database is not balanced and data are missing for many of the countries in the early 1990s. The tariff data does not include estimates of *ad valorem* equivalents for specific and other non-*ad valorem* rates. This is particularly problematic for agricultural products, but is expected to be less of a problem for manufacturing on which this paper concentrates. Non-tariff barriers are also not included. The analysis in this paper thus focuses entirely on direct tariff measures and the potentially important effects of non-tariff barriers are ignored. Applied rates in early years also do not comprehensively cover all the preferential trade agreements.

Additional variables relevant for the study were included in the database. A consumer price index (CPI) based aggregate real effective exchange rate (REER)

index from the IMF International Financial Statistics is included.<sup>14</sup> To capture foreign demand effects, a sector level export weighted foreign GDP index is calculated using foreign GDP values in constant 2000 prices from World Development Indicators and average bilateral exports by sector in 2001 and 2002 from UNComtrade as weights.<sup>15</sup> Sectoral industrial production indices are updated to 2004 using the UNIDO Instat database.

Finally, a variable to capture the effect of tariff liberalisation on the cost of production is constructed. This variable, termed ‘input tariff cost’ (*tcost*), is constructed as follows:

$$tcost_j = \sum_i a_{ij}t_i \quad (1)$$

where  $t_j$  is the tariff on outputs,  $t_i$  is the tariff on inputs and  $a_{ij}$  is the quantity of intermediate input  $i$  used in the production of one unit of  $j$ . The value of *tcost* therefore reflects the proportion of total costs accounted for by tariffs on inputs.

An input-output table for the USA consisting of 17 aggregated manufacturing sectors based on the 3-digit ISIC (Rev. 2) classifications is used to calculate the input coefficients ( $a_{ij}$ ). The input-output table is obtained from Nicita and Olarreaga (2006). The tariff data used to construct *tcost* are aggregated to be consistent with this classification.<sup>16</sup>

There are various caveats regarding this variable. Most importantly, tariff protection on agricultural and mining inputs is not included as the input-output table

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<sup>14</sup> Real effective exchange rate data were unavailable for India, Bangladesh, Egypt, Turkey, El Salvador, Peru, Senegal, Argentina, Brazil, Indonesia, Kenya, Korea, Mexico and Mauritius. CPI based REER indices for these countries were calculated using CPI indices, exchange rate data (from IFS) and bilateral export weights of the top 10 export partners.

<sup>15</sup>  $GDPF_{ijt} = \sum_k \alpha_{ij}^k GDP_t^k$  where  $\alpha_{ij}^k$  is the share of exports of product  $i$  in country  $j$  to foreign country  $k$  over the period 2001 to 2002.

<sup>16</sup> The average sectoral tariff is used to calculate the production costs associated with tariff protection. An alternative approach is to calculate average tariffs on intermediate and capital goods using the use the classification by Broad Economic Categories (BEC).

used does not contain inputs shares for these sectors. This is expected to particularly affect *tcost* values for agricultural-intensive manufacturing sectors. Measurement of protection in the agricultural sector is however difficult given the extensive use of non-tariff barriers and specific tariffs in this sector. Protection on mining products is generally low throughout the period and is not expected to have a substantial impact on *tcost*. A second limitation is that the variable excludes duty rebates on inputs that may be granted to exporters.

Despite the limitations, this database has a number of advantages. Firstly, direct measures of tariff protection are included. Secondly, sectoral data are included enabling a more disaggregated analysis of the effect of trade liberalisation on trade flows. Thirdly, the inclusion of *tcost* allows for an alternative specification of the export relationship that captures the effect of tariff liberalisation input costs. Finally, the database covers a period in which there has been considerable liberalisation and changes in trade flows in many economies. This variation in the data lends itself to econometric analysis.

Some of the key data related to trade flows, tariffs and *tcost* are presented in Table B in the Appendix. The trends in trade flows and tariff liberalisation are consistent with the more detailed analysis presented earlier. Average tariffs fell in all country groupings, including Africa, although tariff protection remains relatively high in this region. Tariff liberalisation also reduced average production costs (*tcost*) in many countries with particularly large decreases in the low-income (14 to 7 percent) and lower-middle-income (11 to 3.3 percent) country groups. The decline is reasonably widespread with 43 of the 51 countries experiencing lower production

costs from liberalisation (or alternatively 23 of the 30 developing economies covered).<sup>17</sup>

As found earlier, manufacturing trade increased for many economies from 1990 with relatively slower growth experienced in Africa. Aggregate import growth was also high, but lagged export growth for low-income and lower-middle-income regions. The effect is an improvement in the manufacturing trade balance in 21 of the 30 developing countries in the sample. The improvements in the trade balance for many of the developing countries point to a potentially important difference to the studies of Santos-Paulino and Thirwall (2004) and UNCTAD (1999) where the trade balance worsened subsequent to liberalisation.

### *Trade Liberalisation And Export Performance*

A simple imperfect substitution model, as discussed in Goldstein and Kahn (1985), is used to estimate the export relationship. Export performance is considered to be determined by variables influencing export supply (domestic export price, domestic costs) and export demand (export price in foreign currency, foreign income, foreign barriers). The reduced form specification of the export relationship for estimation is of the form:

$$x_{ijt} = \alpha_0 + \beta_1 gdpf_{ijt} - \beta_2 reer_{jt} + \beta_3 prod_{ijt} - \beta_4 tcost_{ijt} + \varepsilon_{ijt}, \quad \beta > 0 \quad (2)$$

where  $x$  denotes export volumes,  $gdpf$  is foreign GDP,  $reer$  is the aggregate real exchange rate,  $prod$  is an index of industrial production and  $tcost$  is a measure of input cost from tariff protection for sector  $i$  in country  $j$  over time  $t$ . The index of industrial production is included as a proxy for productive capacity and captures the effect of

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<sup>17</sup> As noted,  $tcost$  does not include the effect of protection on agricultural and mining products and duty drawbacks granted to exporters. The bias is ambiguous. Tariff liberalisation in the agricultural sector over this period will enhance the decline in  $tcost$ . In contrast, if duty drawbacks were available over the entire period, the decline in  $tcost$  for exporters may be more modest than is calculated here.

advances in non-price based elements of competitiveness such as infrastructure, total factor productivity and factor supplies that are correlated with rising levels of real aggregate output.<sup>18</sup> All variables are in natural logarithms.

Various methods are used to estimate the relationship. Firstly, the export function is estimated using pooled OLS. A shortcoming of this method is that time-invariant characteristics of sectors and countries are likely to be correlated with the explanatory variables leading to biased estimates. In an attempt to deal with this problem, dummy variables for country ( $cntry_j$ ) and sector ( $isic_i$ ) and year ( $\lambda_t$ ) are included in the OLS regressions. In the third approach, one-way and two-way fixed effect models are estimated. In the two-way fixed effects model, the error component is specified as:

$$\varepsilon_{ijt} = \lambda_t + cntryisic_{ij} + v_{ijt}$$

where  $cntryisic_{ij}$  denotes the fixed effect for each country and sector combination. This variable captures the effect of time-invariant characteristics of each sector within each country and only the time variation of the variables is used to estimate the  $\beta$  coefficients.

The two-way fixed effect deals with some of the heterogeneity across sectors, but nevertheless imposes common elasticities ( $\beta$ ) across all countries and sectors. To explore possible differences in the response of manufacturing trade flows to trade liberalisation across countries, separate estimates are conducted for Africa and countries grouped according to the World Bank's income group categorisation.

The export results for the pooled low-and middle-income countries are presented in Table 5. The results are separated according to whether mirror export

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<sup>18</sup> It is possible that industrial production is itself a function of exports. In an attempt to deal possible endogeneity bias, lagged values of *prod* were included in alternative estimates. The results are largely unchanged.

data or own country reported data are used as well as according to the estimation technique and inclusion of country, sector and time effects.

The estimated export relationship appears to be well defined with all variables significant and of the correct sign. Export volumes respond positively to rising foreign income, a depreciation of the real effective exchange rate and increased domestic productive capacity. Except for the REER, the estimated elasticities for these variables are largely unaffected by the choice of mirror export or own export data.

Turning to the trade liberalisation variable, mirror export volumes are found to be responsive to *tcost* and the estimated elasticity declines from -0.614 for the pooled OLS (column 1) to -0.196 for the two-way fixed effects model (column 4). The latter, the preferred estimate, suggests that a 10 percent reduction in the input weighted average manufacturing tariff raises manufacturing export volumes by 1.96 percent. The results using own exports are generally similar, although the responsiveness of manufacturing exports to *tcost* is slightly weaker and is insignificant in the two-way fixed effect model.

**Table 5: Determinants of manufacturing export performance in low- and middle-income countries**

	(1)	(2)	(3)	(4)
<b>Using Mirror Exports</b>				
Foreign GDP	0.944**	0.222**	2.869**	0.894**
REER	-0.715**	-0.606**	-0.494**	-0.567**
Industrial production	1.093**	0.678**	0.576**	0.470**
<i>tcost</i>	-0.614**	-0.337**	-0.296**	-0.196**
N	7661	7661	7661	7661
r <sup>2</sup>	0.13	0.769	0.219	0.241
<b>Using own exports</b>				
Foreign GDP	0.902**	0.175**	3.115**	1.134**
REER	-0.234	0.041	-0.006	0.075
Industrial production	1.220**	0.635**	0.526**	0.444**
<i>tcost</i>	-0.483**	-0.216**	-0.107*	-0.075
N	7204	7204	7204	7204
r <sup>2</sup>	0.115	0.743	0.163	0.177
Estimation	OLS	OLS	FE	FE
Time effects		Y		Y

Country and sector Dummies	Y		
Country by sector fixed effects ( $c_{ntryisic_{ij}}$ )		Y	Y

Notes: \*  $p < .05$ ; \*\*  $p < .01$ .

The coefficients of the sector, country and time dummies are not shown.

The  $r^2$  for the fixed effects results is a measure of the within-sector variation explained in the model.

The above results present an aggregate analysis of all low- and middle-income economies in the sample. Yet the response of trade flows to liberalisation is expected to differ across countries (Santos-Paulino and Thirlwall 2004). To evaluate this further, Table 6 presents disaggregated results for various country groups, including Africa.

The estimates vary considerably across country groupings and are also sensitive to the choice of export data (mirror vs. own data) and sector and country effects. A significant coefficient of the correct sign is generally found for foreign GDP, REER and industrial production. Interestingly, African (mirror) exports of manufactured goods appear to be more sensitive to foreign GDP and the REER with estimated elasticities at times more than twice those from the pooled developing country sample.

Lower inputs costs from trade liberalisation are associated with improved export performance in most of the country groups. In the OLS estimates for Africa, a 10 percent reduction in  $tcost$  is estimated to improve export volumes by 7.1 percent when using mirror exports and 10.2 percent when using exports as reported by these economies. A slightly lower elasticity, -0.51, is estimated for Africa in the fixed effect estimate.

Looking at the other regions, it is apparent that manufactured exports in upper-middle-income and OECD economies are not well explained by changes in  $tcost$ . The estimated elasticity is often insignificant and at times significant and of the incorrect sign (positive). Better relationships are estimated for lower-middle-income countries

where the estimated elasticity is significant in all estimates and ranges from -0.19 to -0.34.<sup>19</sup>

**Table 6: Determinants of manufacturing export performance by country group**

	All countries	Low and middle-income	Low-income	Lower-middle	Upper-middle	OECD	Africa
<b>Using Mirror Exports</b>							
<i>Country by sector fixed effects</i>							
Foreign GDP	1.501**	0.894**	0.868	1.048**	0.229	1.959**	1.811**
REER	-0.240**	-0.567**	-1.283**	-0.605**	-0.433**	0.383**	-1.706**
Industrial production	0.482**	0.470**	0.310**	0.353**	0.676**	0.500**	0.450**
<i>tcost</i>	-0.008	-0.196**	-0.12	-0.186*	-0.066	0.028	0.112
N	15513	7661	1211	3121	3329	7852	1850
r2	0.208	0.241	0.324	0.151	0.314	0.204	0.267
<i>Country and sector dummy variables</i>							
Foreign GDP	0.419**	0.222**	0.215**	0.133**	0.240**	0.764**	0.271**
REER	-0.351**	-0.606**	-1.241*	-0.635*	-0.363*	0.072	-1.689**
Industrial production	0.583**	0.678**	0.618**	0.415**	0.790**	0.288**	0.615**
<i>tcost</i>	-0.385**	-0.337**	-0.103	-0.335**	-0.460**	-0.258**	-0.708**
N	15513	7661	1211	3121	3329	7852	1850
r2	0.793	0.769	0.791	0.753	0.781	0.803	0.759
<b>Own Exports</b>							
<i>Country by sector fixed effects</i>							
Foreign GDP	1.503**	1.134**	0.052	1.445**	1.031	0.954**	0.663
REER	0.063	0.075	-0.643*	-0.770**	0.391**	0.286**	-1.522**
Industrial production	0.476**	0.444**	0.153	0.226**	0.905**	0.403**	0.251
<i>tcost</i>	0.100**	-0.075	-0.767**	-0.201*	0.463**	0.040*	-0.505**
N	14963	7204	1060	3111	3033	7759	1510
r2	0.133	0.177	0.289	0.151	0.237	0.108	0.0978
<i>Country and sector dummy variables</i>							
Foreign GDP	0.367**	0.175**	0.121	0.126**	0.102*	0.757**	0.197**
REER	-0.072	0.041	-0.637	-0.889**	0.546*	-0.108	-1.710**
Industrial production	0.523**	0.635**	0.429*	0.338**	0.989**	0.172*	0.603**
<i>tcost</i>	-0.342**	-0.216**	-0.121	-0.299**	-0.178	-0.292**	-1.019**
N	14963	7204	1060	3111	3033	7759	1510
r2	0.762	0.743	0.733	0.748	0.751	0.774	0.666

Notes: \* p<.05; \*\* p<.01.

<sup>19</sup> To test the sensitivity of the results to choice of tariff variable, additional estimates were conducted using the simple average MFN tariff on output and *tcost* calculated using import weighted applied rates that account for tariff preferences. The results using the average MFN tariff on output are poor. The coefficient is significant and of the expected sign in only 7 of the 28 estimates. The results using the alternative measure of *tcost* are significant and correctly signed in 15 out of the 28 estimates.

The results provide evidence that tariff liberalisation is a statistically significant factor explaining export performance in developing economies. What remains unclear is the magnitude of the contribution of tariff liberalisation to export growth in this period. The first noticeable issue is the relevance of country and sector effects in explaining export performance. The R<sup>2</sup> of the pooled low- and middle-income country sample increases from 0.12 for the pooled OLS to 0.74 for the pooled OLS including sector, time and country dummies (Table 5). Over 60 percent of the variation in exports is explained by these dummy variables. Only 21 percent of the variation of exports within sectors over time is explained in the fixed effect estimates. A large proportion of export performance therefore appears to be attributed to unobserved country, sector and time effects.

To explore this further, the coefficient estimates in Table 5 are used to calculate the effect of changes in *tcost* on export volumes between 1992/95 and 2003/04. Table 7 presents two estimates using the *tcost* elasticities of -0.196 and -0.337. Export volumes in the average developing economy grew by 110 percent over the period. Production costs associated with tariffs fell by 47 percent for the average economy which translates roughly into a 9 percent to 16 percent increase in export volumes depending on the *tcost* elasticity selected. The export weighted average effect on export volumes is higher at 14 to 24 percent. For the average African economy, the decline in *tcost* is associated with an increase in export volumes ranging from 10 percent to 17 percent. This is equivalent to a 12 to 20 percent of the change in total exports in the average African economy over this period. Thus, while liberalisation raises export volumes, its contribution to overall export growth in the 1990s appears to be relatively small.

**Table 7: Contribution of tariff liberalisation to changes in manufacturing export volumes, 1992/95 to 2003/04**

	Change		Estimated change in exports	
	<i>tcost</i>	Exports	Elasticity 1 (-0.196)	Elasticity 2 (-0.337)
Africa	-0.49	0.82	0.10	0.17
	<i>-0.59</i>	<i>0.82</i>	<i>0.11</i>	<i>0.20</i>
Low-income	-0.73	1.12	0.14	0.25
	<i>-0.83</i>	<i>1.32</i>	<i>0.16</i>	<i>0.28</i>
Lower-middle-income	-0.47	1.18	0.09	0.16
	<i>-1.13</i>	<i>1.96</i>	<i>0.22</i>	<i>0.38</i>
Upper-middle-income	-0.28	0.99	0.06	0.09
	<i>-0.20</i>	<i>1.41</i>	<i>0.04</i>	<i>0.07</i>
Developing	-0.47	1.10	0.09	0.16
	<i>-0.70</i>	<i>1.67</i>	<i>0.14</i>	<i>0.24</i>

Notes: Values in italics reflect weighted averages where export values from 2002-04 are used as weights. The other values reflect the simple country average.

### *Manufacturing Import Performance*

The same estimation strategy is employed to estimate the determinants of manufacturing import volumes. The estimated import equation is:

$$m_{ijt} = b_o + \delta_1 gdp_{jt} + \delta_2 reer_{jt} + \delta_3 tariff_{ijt} + v_{ijt} \quad (3)$$

where *gdp* is foreign GDP, *reer* is the real effective exchange rate and *tariff* is the average nominal MFN tariff on output and is calculated as (1+tariff). The variables *gdp* and *reer* are only defined at the country level. The expected signs on the variables are:  $\delta_1 > 0$ ,  $\delta_2 > 0$  and  $\delta_3 < 0$ .

The elasticities estimated using the pooled OLS with dummy variables and the two-way fixed effects model are presented in Table 8. Only the results using mirror import data are presented as the results using own country reported data are similar. The coefficients are generally of the expected signs: import volumes are negatively affected by a real depreciation of the currency, a decline in GDP and higher tariffs. Looking more closely at the results for the aggregated low- and middle-income region, tariff protection negatively affects import volumes with an elasticity ranging

from -0.48 to -0.71. These results imply that changes in MFN tariffs that lead to a 10 percent rise in the tariff inclusive price of imports (1+tariff) are associated with a reduction in import volumes of 4.8 to 7.1 percent. This is a very inelastic response to liberalisation and implies that MFN tariff liberalisation from 1992/95 to 2003/04 in the average developing economy is only associated with an increase in import volumes of between 4 and 6 percent. Import volumes of the average developing country grew by 88 percent over this period.

**Table 8: Determinants of manufacturing import volumes by country group**

	All countries	Low and middle-income	Low-income	Lower-middle	Upper-middle	OECD	Africa
<b>Using Mirror Imports</b>							
<i>Country by sector fixed effects</i>							
REER	0.551**	0.760**	0.35	0.764**	0.936**	0.314**	0.004
GDP	1.252**	0.812**	-0.016	0.664**	0.989**	1.046**	-0.012
Tariff	-0.394**	-0.482**	-0.462	-0.041	-1.663**	0.813*	0.015
N	16855	8666	1595	3610	3461	8189	2293
r2 within	0.373	0.23	0.0693	0.191	0.255	0.276	0.046
r2 overall	0.354	0.233	0.0014	0.214	0.235	0.273	0.001
<i>Country and sector dummy variables</i>							
REER	0.544**	0.767**	0.227	0.791**	0.873**	0.294**	-0.035
GDP	1.230**	0.757**	-0.106	0.424	1.133**	1.004**	0.000
Tariff	-0.513**	-0.714**	-1.204**	-0.785**	-0.618**	0.204	-0.931**
N	16855	8666	1595	3610	3461	8189	2293
r2 within							
r2 overall	0.846	0.821	0.812	0.836	0.822	0.854	0.804

Notes: \* p<.05; \*\* p<.01.

African manufacturing import volumes are not well explained by the regression. Almost all the coefficients are insignificant, although all the exceptions are for the tariff variable. Very little of the variation of import volumes over time is explained by the variables included in the regressions. This may reflect the lack of enough sector specific variables in the specification. The results also suggest that import volumes in Africa are driven by other country specific effects not included in

the regression. A similarly poor import response to relative prices and import taxes in Africa is found by Santos-Paulino and Thirwall (2004).

### *Trade Balance*

The final relationship analysed is the effect of trade liberalisation on the trade balance. This relationship depends on the relative responsiveness of exports and imports to tariff protection. Much of the current literature on developing economies suggests a muted response of exports to liberalisation relative to the response in import volumes leading to worsening trade balance (UNCTAD 1999; Santos-Paulino and Thirwall 2004).

To test this effect, the following trade balance equation is estimated:

$$tb_{ijt} = b_o + \theta_1 gdp_{jt} + \theta_2 reer_{jt} + \theta_3 tariff_{ijt} + \theta_4 gdpf_{ijt} + \theta_5 prod_{ijt} + \theta_6 tcost_{ijt} + \nu_{ijt} \quad (4)$$

where  $tb$  is measured as the log ratio of the value of exports to the value of imports. The trade balance is expected to improve in response to a depreciation of the real exchange rate, a rise in foreign GDP, a decline in domestic consumption (proxied by domestic GDP), and a rise in productive capacity ( $prod$ ). Liberalisation has an ambiguous effect. Rising tariffs on inputs, measured by the variable  $tcost$ , are expected to reduce competitiveness of exporters and domestic producers and therefore reduce import and export volumes. Tariffs on final goods protect domestic industries from import competition (reduce imports), but also reduce the incentive to produce for the export market (reduce exports). The sign can therefore be positive or negative.

Table 9 gives the results for the trade balance using the pooled OLS with dummy variables and the two-way fixed effects model. To conserve space only the results using mirror trade values are presented as the results using own trade data are quantitatively similar.

**Table 9: Determinants of the trade balance**

	All countries	Low and middle-income	Low-income	Lower-middle	Upper-middle	OECD	Africa
<b>Using Mirror trade data</b>							
<i>Country by sector fixed effects</i>							
REER	-0.642**	-0.873**	-1.635**	-0.725**	-0.777**	-0.172**	-1.327**
GDP foreign	0.519**	0.402*	0.960*	0.374	0.161	0.078	1.005**
GDP	-0.691**	-0.624**	2.223**	-0.578*	-1.586**	-0.911**	2.552**
Indust prod	0.336**	0.387**	0.218*	0.223**	0.646**	0.290**	0.354**
Tariff	-0.424**	0.538**	0.208	-0.07	2.758**	-1.672**	-0.044
tcost	0.027	-0.206**	0.154	-0.200**	-0.392**	0.000	-0.240*
N	15491	7651	1213	3119	3319	7840	1850
r2 within	0.072	0.124	0.212	0.107	0.183	0.083	0.190
r2 overall	0.032	0.039	0.254	0.014	0.080	0.006	0.104
<i>Country and sector dummy variables</i>							
REER	-0.812**	-0.820**	-1.575**	-0.785**	-0.582**	-0.487**	-1.267**
GDP foreign	0.560**	0.339**	0.388**	0.307**	0.307**	0.881**	0.476**
GDP	-0.816**	-1.055**	1.7	-0.716	-2.031**	-0.998**	2.436**
Indust prod	0.474**	0.502**	0.521**	0.264**	0.625**	0.280**	0.340**
Tariff	0.786**	0.472*	1.118	0.578*	0.149	-0.258	0.483
tcost	-0.492**	-0.475**	-0.436	-0.514**	-0.511**	-0.335**	-0.779**
N	15491	7651	1213	3119	3319	7840	1850
r2 overall	0.392	0.512	0.648	0.554	0.408	0.291	0.551

Notes: \* p<.05; \*\* p<.01.

The trade balance relationship appears to be well defined and most of the variables are significant and of the correct sign for all country groups. The results are also consistent across the two estimation approaches. Focussing on the tariff variables, higher input tariff costs (*tcost*) negatively affect the *tb* in low- and middle-income countries and the elasticity ranges from -0.21 to -0.48. In contrast, output tariffs improve *tb* with elasticity estimates ranging from 0.47 to 0.54. A 10 percent increase in (1+tariff) raises the value of exports relative to the value of imports by approximately 5 percent. In economies with balanced trade or trade surpluses, this will result in an improvement in the manufacturing trade balance (export value – import value). However, most developing economies have a negative manufacturing trade balance and the trade balance may still worsen.

The results for Africa are consistent with those for developing countries as a whole. The value of exports relative to imports appears to be more strongly affected by the real exchange rate and foreign GDP compared to other developing economies. The results on tariffs are consistent with the export and import functions estimated earlier. Nominal tariffs on outputs are unrelated to changes in  $tb$ , while increases in  $tcost$  are associated with declining  $tb$ . This suggests that African exporters and domestic import competing firms are responsive to improved profitability arising from lower input costs.

### *Other Factors*

The results presented indicate that tariff liberalisation enhanced manufacturing trade flows in developing countries including Africa between 1989 and 2004, but not by much. This suggests a limited supply response to the changing incentives arising from tariff liberalisation. There is much evidence to support this view. In a comprehensive review of economic performance in Africa, Collier and Gunning (1999) argue that distorted product and credit markets, high risk, inadequate social capital, inadequate infrastructure and poor public services are key factors inhibiting investment responses by African firms to opportunities.

Micro-level institutions that affect the cost of exporting are also important (Johnson and others 2007). These include port efficiency, customs environment, regulatory environment, policies affecting cost of entry (registering a new business) (Wilson and others 2005). Africa performs poorly in terms of these measures which raises production costs relative to its competitors. For example, it takes 40 days to export from a SSA country (compared to 11 in OECD countries) due to a combination of factors: excessive tariff bands, a lack of electronic documentation, an excessive number of required documents, inefficient customs systems, poor roads, port

congestion and corruption at the border (World Bank 2005). The inclusion of indirect costs associated with operating expenses – transport, telecommunication, security, land, bribes, marketing – lead to substantial reductions in productivity in manufacturing firms in Africa (Eiffert and others 2005). These costs make up over 20 percent of total costs in the African sample (Mozambique, Eritrea, Kenya, Tanzania, Uganda and Zambia) and exceed the direct labour costs.

Empirical research suggests that costs associated with trade related infrastructure and the business climate have a strong impact on export performance in African economies. Limão and Venables (2001: 41), for example, find that poor infrastructure and consequent high transport costs to a large extent explains why Africa is often found to under-perform in trade terms. Elbadwi (2001) estimates export functions for a sample of 41 developing countries (11 from SSA) over period 1980-95 and finds that transaction costs (measured by index of corruption, length of paved roads and number of fax machines) are major determinants of manufactured exports and that investing on reducing these costs generates the highest payoff for the capacity to export manufactures. Thus appropriate policies dealing with transaction costs would enable Africa shift out of primary products and into manufactures.<sup>20</sup>

Transport delays appear to be particularly problematic. Djankov and others (2006: 4) estimate that each additional day that a product is delayed prior to being shipped reduces trade by more than 1 percent. For Africa, the implications are immense. They calculate that Uganda's exports would increase by 31 percent if it reduced its factory-to-ship time from 58 days to 27 (the median for the sample). If the Central African Republic reduced its factory-to-ship time from 116 days to 27, exports would nearly double. *“The same effect could be achieved if the Central*

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<sup>20</sup> See Wood and Mayer (2001) for an alternative view.

*African Republic cut 6200 km from its distance to the main markets—greater than the distance from Bangui to London” (2006:4).*

Finally, supportive evidence is provided in firm-level studies. Clarke (2005) uses enterprise-level data from eight African countries – Ethiopia, Kenya, Mali, Mozambique, Senegal, Tanzania, Uganda and Zambia – and finds that restrictive trade and customs regulations discourage manufacturing firms from exporting. Improvements in these areas can have large effects on trade flows: an improvement in the customs and trade regulations index from the most restrictive country (Tanzania) to the second least restrictive (Zambia) would increase exports as a share of production by over 4 percentage points (or 33 percent) for the average enterprise in the sample. The result is consistent with Dollar and others (2006) who find that low customs clearance times, reliable infrastructure, and good financial services make it more likely that firms in a range of developing countries (none African) will export.

## **Conclusion**

A wide debate has emerged on the appropriate policies to deal with Africa’s marginalisation in world trade. The outcome is a range of different policy prescriptions to facilitate Africa’s integration into the world trading environment. The source of these policy prescriptions emerge from very different interpretations of the cause of Africa’s marginalisation in world trade. Earlier research by the World Bank prioritised tariff liberalisation and enhanced competition in the transport sector. Other proposals have emphasised policies that prioritise economic growth in Africa (Rodrik 1997). Finally, recent research has argued that the major constraints to trade flows are prohibitively high transport costs driven by poor infrastructure and trade-related institutions (Djankov and others 2006; Limão and Venables 2001).

This study engages in this debate. It presents a comparative analysis of trade performance and tariff liberalisation in SSA economies since the early 1990s. It also estimates the contribution of tariff liberalisation to manufacturing export growth in African and other developing economies during the 1990s using sector-level data and direct measures of tariff protection. Three key results emerge: Firstly, African countries continue to be marginalised in world trade despite considerable tariff liberalisation in many of these countries. Second, tariff liberalisation has had a statistically significant and positive effect on manufacturing trade flows, but its contribution to overall growth in trade has been small. Africa is no different from other developing countries in this regard. Thirdly, tariff liberalisation is not associated with a worsening manufacturing trade balance. Increased imports are countered by growth in exports.

What are the policy implications? The inelastic response of trade flows to trade liberalisation suggests that domestic supply and market constraints inhibit the response of African manufacturing firms to tariff liberalisation. Many of these supply constraints are dealt with in detail by Collier and Gunning (1999). Although not tested directly, this paper suggests that poor trade-related infrastructure and institutions (management of customs offices, port facilities, trade regulations, etc.), raise production costs in African economies relative to its competitors and thus inhibit trade responses to tariff liberalisation. These institutions may also inhibit the transmission of changes in border prices from tariff liberalisation to domestic firms resulting in a muted response.

The implication is that the effect of liberalisation will be enhanced through complementary policies that lower costs associated with trade-related infrastructure and institutions. This does not imply that liberalisation should only be conducted after

such complementary policies have been implemented. Tariff liberalisation leads to the emergence of import and export oriented industries that mobilise for improvements in trade-related infrastructure and institutions.

African economies can also reduce the anti-export bias through removing tariffs on key production inputs. Average tariffs on intermediate and capital goods remain relatively high in Africa and act as a tax on export production. Although duty drawback mechanisms can be developed to deal with this, their success in Africa is poor (Clarke 2005). The strong export response by African clothing firms to opportunities under AGOA, particularly in those economies where strict rules of origin relating to textile inputs are waived, suggests that African manufacturing exporters are very sensitive to factors that influence their production costs.

Domestic policy reforms that influence the cost of doing business and trading in Africa, including tariff liberalisation, can lead to substantial growth in trade flows and overall economic performance.

## Appendix

**Table A: Tariff levels and changes by end-use for African countries**

	Capital goods			Consumption goods			Intermediate goods			Passenger vehicles			Total		
	199 0-95	200 4-06	change	199 0-95	200 4-06	change	199 0-95	200 4-06	change	199 0-95	200 4-06	change	199 0-95	200 4-06	change
<b>MFN Tariffs</b>															
Morocco	47	9	-26	64	33	-19	42	19	-16	77	25	-30	45	19	-18
Libya	23	0	-19	22	0	-18	14	0	-12	76	0	-43	21	0	-17
Mauritius	28	1	-21	30	8	-17	20	3	-14	80	0	-44	25	4	-17
Côte d'Ivoire	24	7	-13	17	12	-5	22	5	-14	54	20	-22	22	8	-12
Nigeria	14	5	-8	38	21	-12	22	11	-9	42	18	-17	24	12	-10
Kenya	23	6	-14	23	25	1	21	7	-11	25	14	-9	21	9	-10
Burkina Faso	13	8	-5	19	14	-5	23	10	-11	31	20	-8	22	11	-8
Ethiopia	14	5	-8	33	17	-12	15	13	-2	65	24	-25	18	10	-7
Rwanda	17	19	1	43	17	-18	21	15	-5	40	30	-7	25	17	-7
Uganda	12	3	-8	20	20	0	17	9	-7	23	13	-9	17	10	-6
Zambia	20	10	-9	22	21	-1	16	9	-6	20	18	-2	18	11	-6
South Africa	8	2	-6	16	12	-3	8	3	-5	57	26	-20	12	6	-5
Zimbabwe	19	17	-2	36	26	-7	23	15	-6	43	46	2	24	17	-5
Tanzania	9	4	-4	15	25	8	19	8	-9	13	12	0	16	10	-5
Tunisia	23	10	-11	33	32	-1	26	21	-4	27	2	-20	26	21	-4
Chad	12	9	-3	24	20	-3	15	13	-2	30	30	0	18	13	-4
Algeria	17	8	-7	18	16	-2	14	12	-2	31	16	-12	15	12	-3
Egypt, Arab Rep.	19	6	-11	20	45	20	14	8	-5	96	47	-25	16	14	-2
Malawi	27	8	-15	30	15	-12	21	27	5	23	24	1	23	22	-1
<b>Equatorial</b>															
Guinea	12	13	1	25	27	1	13	14	0	30	30	0	16	15	0
Gabon	11	12	0	22	21	-1	14	15	0	30	30	0	17	17	0
Mali	4	8	3	13	13	-1	10	10	1	30	20	-8	11	11	0
Cameroon	11	13	1	17	20	3	13	12	-1	30	30	0	14	15	0
Congo, Rep.	11	12	0	19	22	3	16	16	0	30	30	0	17	17	1
Ghana	7	5	-2	16	14	-2	10	14	4	15	7	-7	10	11	1
Madagascar	9	6	-2	4	12	8	4	6	2	15	16	1	5	7	2
CAR	11	13	2	20	22	2	14	16	1	30	30	0	15	17	2
Mozambique	7	6	0	30	13	-12	12	8	-4	26	15	-8	17	9	-7
Seychelles	17	7	-8	41	87	33	18	1	-14	165	142	-9	24	34	9
<b>Applied Tariffs</b>															
Morocco	47	5	-28	64	22	-25	42	12	-21	77	21	-32	45	13	-22
Libya	23	0	-19	22	0	-18	14	0	-12	76	0	-43	21	0	-17
Mauritius	28	1	-21	30	6	-18	19	3	-14	80	0	-44	24	3	-17
Malawi	27	8	-16	30	11	-14	21	7	-12	23	24	1	23	8	-12
Côte d'Ivoire	24	7	-13	17	11	-5	22	5	-14	54	20	-22	22	8	-12
Kenya	23	6	-14	23	22	-1	20	6	-12	25	14	-9	20	8	-10
Nigeria	14	5	-8	38	21	-12	22	11	-9	42	18	-17	24	12	-10
Rwanda	17	19	1	43	14	-20	21	11	-8	40	26	-10	25	14	-9
Burkina Faso	13	8	-5	19	12	-6	23	9	-12	31	20	-8	22	11	-9
Tunisia	23	8	-12	33	26	-6	26	17	-7	27	1	-20	26	17	-7
Zambia	20	9	-9	22	17	-4	16	8	-7	20	17	-2	18	10	-7
Ethiopia	14	5	-8	33	17	-12	15	13	-2	65	24	-25	18	10	-7
Tanzania	9	4	-4	15	19	3	19	7	-10	13	12	0	16	8	-7
South Africa	8	1	-7	16	11	-4	8	3	-5	57	25	-20	12	5	-6
Uganda	11	3	-7	16	16	0	12	6	-6	23	13	-9	14	7	-6
Zimbabwe	19	17	-1	34	26	-6	22	15	-6	43	46	2	23	17	-5
Algeria	17	8	-8	18	15	-2	14	10	-4	31	16	-12	15	11	-4
Egypt, Arab Rep.	19	6	-11	20	44	20	14	8	-5	96	46	-25	16	14	-2
Chad	11	9	-2	20	20	0	13	13	0	30	30	0	15	13	-1
Mali	4	8	3	13	12	-1	10	9	0	30	20	-8	11	10	0
<b>Equatorial</b>															
Guinea	12	13	1	25	27	1	13	14	0	30	30	0	16	15	0
Gabon	11	12	0	22	21	-1	14	15	0	30	30	0	17	17	0
Cameroon	11	13	1	17	20	3	13	12	-1	30	30	0	14	15	0
Congo, Rep.	11	12	0	19	22	3	16	16	0	30	30	0	17	17	1
Ghana	7	5	-2	16	14	-2	10	14	4	15	7	-7	10	11	1
Madagascar	9	6	-2	4	12	7	4	6	1	15	16	1	5	7	1
Mozambique	7	6	0	30	13	-13	12	7	-5	26	14	-9	17	8	-8
CAR	11	13	2	17	22	5	13	16	2	30	30	0	13	17	4
Seychelles	17	7	-8	41	87	33	18	1	-14	165	142	-9	24	34	9

**Table B: Manufacturing trade and tariffs from the early 1990s**

	Share trade	Average annual growth, 1990-2004		Average MFN tariff (import weighted)			Average tariff-related input cost		
	2004	Imports	Exports (mirror)	1990-95	2001-2004	% change	1990-95	2001-2004	% change
<b>Low income</b>	<b>2.1</b>	<b>8.3</b>	<b>11.7</b>	<b>34.2</b>	<b>18.7</b>	<b>-11.6</b>	<b>14.1</b>	<b>7.0</b>	<b>-50.7</b>
Bangladesh	0.1	7.6	14.7	82.4	18.9	-34.8	43.0	12.7	-70.4
Cote D'Ivoire	0.0	3.4	2.3	23.0	10.8	-9.9	6.9	3.6	-47.6
Ghana	0.0	8.4	-0.4	11.1	13.4	2.1	4.3	7.1	64.9
India	1.1	12.1	12.6	60.7	28.5	-20.0	23.8	10.8	-54.6
Indonesia	0.7	4.6	11.7	13.9	6.1	-6.9	5.4	2.2	-59.5
Kenya	0.0	5.3	9.6	25.5	13.1	-9.9	9.4	5.7	-39.5
Uganda	0.0	6.3	7.6	16.7	6.5	-8.7	5.8	2.5	-57.6
<b>Lower middle income</b>	<b>12.9</b>	<b>14.2</b>	<b>17.3</b>	<b>25.0</b>	<b>8.7</b>	<b>-13.1</b>	<b>11.1</b>	<b>3.3</b>	<b>-70.3</b>
Algeria	0.2	5.5	-0.7	15.9	13.5	-2.0	2.7	6.1	121.3
Bolivia	0.0	7.2	7.7	9.7	9.0	-0.6	3.5	3.1	-11.7
China	9.9	17.9	18.8	30.9	8.4	-17.2	12.4	3.3	-73.4
Colombia	0.2	9.0	11.0	11.7	11.3	-0.3	4.2	4.3	2.6
Ecuador	0.1	10.8	10.9	11.0	11.0	0.0	3.8	3.6	-3.3
Egypt	0.1	2.0	12.2	23.8	12.8	-8.9	9.8	6.2	-36.3
El Salvador	0.1	13.7	18.7	10.8	9.7	-1.0	6.0	5.9	-1.1
Morocco	0.2	7.5	8.7	59.6	25.1	-21.6	25.1	12.0	-52.4
Peru	0.1	9.6	8.8	15.8	9.4	-5.5	6.2	4.0	-34.8
Philippines	0.8	11.8	15.8	17.0	3.2	-11.8	6.8	1.2	-82.3
Sri Lanka	0.1	8.1	12.6	27.4	7.5	-15.6	13.7	2.4	-82.3
Tunisia	0.2	6.6	11.1	27.9	23.2	-3.7	11.3	10.7	-5.3
Turkey	1.1	11.9	15.3	7.9	4.8	-2.9	3.6	2.3	-36.4
<b>Upper middle income</b>	<b>11.6</b>	<b>11.5</b>	<b>11.5</b>	<b>11.9</b>	<b>9.5</b>	<b>-2.1</b>	<b>4.2</b>	<b>3.2</b>	<b>-22.6</b>
Argentina	0.4	17.0	7.6	12.6	13.8	1.0	3.8	4.1	6.9
Brazil	1.0	9.2	8.0	17.9	11.8	-5.2	5.4	4.3	-20.5
Chile	0.3	8.2	9.1	10.9	6.8	-3.7	4.4	2.7	-38.2
Korea, Rep.	3.4	8.3	11.6	9.5	5.3	-3.9	3.5	1.9	-44.5
Malaysia	1.9	9.4	13.5	9.7	5.1	-4.2	4.0	2.0	-48.7
Mauritius	0.0	3.7	4.7	26.2	10.4	-12.6	11.6	5.7	-50.8
Mexico	2.8	15.7	13.4	12.1	14.9	2.5	4.6	5.6	21.1
Poland	1.1	36.3	15.2	10.5	9.8	-0.7	3.6	3.6	0.2
South Africa	0.6	8.1	8.7	16.3	8.9	-6.4	4.0	1.9	-52.2
Uruguay	0.0	7.2	3.7	9.8	13.0	2.9	3.5	4.6	32.0
<b>OECD</b>	<b>73.5</b>	<b>6.2</b>	<b>5.8</b>	<b>6.0</b>	<b>3.1</b>	<b>-2.7</b>	<b>1.9</b>	<b>1.0</b>	<b>-46.4</b>
<b>Africa</b>	<b>1.4</b>	<b>6.2</b>	<b>7.5</b>	<b>24.6</b>	<b>14.1</b>	<b>-8.5</b>	<b>7.6</b>	<b>4.9</b>	<b>-35.5</b>

Source: Updated data based on Trade, Production and Protection (Nicita and Olarreaga 2006).

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