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Are Imports in Africa Responsive to Tariff Reductions?

by

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Abstract

In the 1980's and 1990's many African countries liberalised their trade policy, although since the mid 1990s there are countries that did not alter tariffs. This allows us to analyse the effects of trade liberalisation on the change in imports using Difference-in-Differences techniques that allow us to evaluate the impact on imports of trade liberalisation at the general and sector-specific level. During the period of study (1996-2004), Algeria (in 1997), Ethiopia (2001), Egypt (1998), Tanzania (2000) and Uganda (2000) all liberalised their tariffs. These countries act as a 'treatment' group. In comparison, Cameroon, Gabon and Madagascar all left their tariffs unchanged. These countries act as our 'control' group or counterfactual. We compare the effects on imports for liberalising countries relative to non-liberalising countries, controlling for the timing of liberalisation, trends in import capacity (country effects) and in sector imports across countries (product market effects). Overall, using three methods of measuring imports, there is little evidence that suggests imports increased for the treatment group countries relative to the control group countries. This is true at the general and sector-specific levels.

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Outline

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1.   INTRODUCTION

Trade and expanding trade is important to any development strategy for Africa, in particular sub-Saharan Africa (SSA). The Report of the Commission for Africa (2005) devotes considerable attention to trade, but with a strong focus on expanding and diversifying exports. Morrissey (2005) argues that it neglects the potential impact of increased imports due to liberalisation; further reductions of Africa's own barriers to trade are rather simply viewed as offering 'substantial gains from opening up to cheaper imports' (Commission for Africa, 2005: page 253, para 21). There should be a benefit of reducing distortions and encouraging more competitive local production, although achieving these is conditional on improving domestic supply response and the flexibility of factor markets, while an increased variety of cheaper (imported) goods benefits consumers (including firms using imported inputs). On the other hand, there is a potential cost of increased exposure to cheaper imports that may undermine domestic import-competing producers. An important empirical question is how responsive are imports to tariff reductions in African countries? This is the question addressed here, using aggregate and sector-level data.

There is a literature suggesting that African countries would benefit from trade liberalisation. Typically, the context is of multilateral liberalisation, such as under the WTO. For example, Anderson *et al* (2006) argue that significant multilateral trade liberalisation would increase incomes in SSA by proportionally more than in other regions, developing or high income. Under partial liberalisation, the more likely actual scenario, the gains for SSA are significantly reduced (and other studies estimate they could even be eliminated). Developed country tariffs should not be considered the primary concern: Hertel and Martin (2000) show that developing countries face even higher tariffs on exports to other developing countries (18.3 percent on average) than on exports to developed countries (15.1 percent). However, SSA countries are often the least well positioned to benefit from tariff reductions. Hoekman *et al* (2004) estimate the effect on world prices of a 50% reduction in tariffs for a sample of 267 commodities. The estimated world price effects are then used to estimate the impact on imports and welfare for 144 countries. The authors find that least developed countries (mostly SSA) actually experience a welfare loss if all WTO members reduce tariffs. These studies are based on simulations which, *inter alia*, include assumptions about the

price elasticity of import demand. In an African context, a prior question is how responsive have imports been to tariff reductions?

Ackah and Morrissey (2005) provide evidence that African countries have liberalised trade policy significantly since the 1980s; although the pace and pattern of reforms varies from country to country, the trend is one of import liberalisation. In general, tariffs have been reduced by about a half. One would expect this to encourage an increase in imports. Santos-Paulino (2002a) finds that imports increase following liberalisation (represented by a binary variable) and indeed the responsiveness of import demand to national income increases (i.e. there tends to be an increase in the propensity to import). For developing countries overall, trade liberalisation increases the rate of growth of imports by almost three-quarters, with a much greater estimated impact for SSA (given the low base), although the coefficient on tariffs tends to be insignificant for SSA. Razafimahefa and Hamori (2005) find that the long-run response of aggregate real imports to the real import price index is inelastic in Madagascar (-0.5) and Mauritius (-0.6). One would expect much lower short-run responses to tariff reductions.

Santos-Paulino and Thirlwall (2004) consider the effect of import duties (tax revenue on imports as a share of import value) on import growth for a sample of 22 countries, five in Africa (but only two SSA), over 1972-98. They find only a modest effect: 'the effect of a one percentage point reduction in import duties has been to raise import growth by only 0.2 percentage points. Since duties fell on average by only 2.8 percentage points, the total impact of duty reduction on import growth has been minimal' (Santos-Paulino and Thirlwall, 2004: F59). As with Santos-Paulino (2002a), the coefficient on duties for the African sub-sample is insignificant (although it is a small sample). The results in these studies suggest that tariff reductions in SSA are unlikely to lead to a large increase in imports.

Another concern regarding liberalisation is that imports may increase faster than exports and the resulting trade deficit will create macroeconomic imbalances that retard growth (Thirlwall, 2003, pp. 16-20). The evidence that exports increase following liberalisation is weaker than for imports: export growth tends to be slower than import growth (Santos-Paulino, 2002b; Santos-Paulino and Thirlwall, 2004), widening the trade or balance of payments deficit and therefore constraining growth (Thirlwall,

2003; Santos-Paulino and Thirlwall, 2004). Wu and Zheng (2008) use measures of trade liberalisation dates to identify the impact of trade liberalisation on imports, exports, and overall trade balance for a large sample of developing countries. They find strong and consistent evidence that trade liberalisation leads to higher imports and exports but do not find robust evidence for a negative impact on the overall trade balance; the strongest evidence is when they use the Wacziarg and Welch (2003) dating of liberalisation. However, Africa, in particular SSA, has generally avoided this adverse effect, especially to the extent that aid finances the trade deficit (in fact imports are required to accommodate the relatively large aid inflows; Morrissey, 2005): imports have risen fairly slowly and export growth has tended to match this (on average) so that trade deficits have changed little during the 1990s (Ackah and Morrissey, 2005).

There are limitations in the way these studies attempt to identify an effect of tariff reductions on imports. Santos-Paulino (2002a) and Wu and Zheng (2008) use a liberalisation dummy, as is common in the literature, which may be a poor indicator of the actual changes in tariffs. Furthermore, all of the studies are based on aggregate country-level data, whereas tariffs and reductions vary across products and it seems reasonable to assume that the effects on imports will vary across products. We address this concern by estimating effects on aggregate, agriculture, manufacturing and 16 sector classifications of imports for eight African countries over the period 1996-2004 (precise years vary across countries). Furthermore, we employ a 'difference-in-difference' (DiD) approach which allows us to evaluate the impact on imports of tariff reductions (the only element of trade liberalisation we are able to consider) at the general and sector-specific level. During the period of study Algeria (in 1997), Ethiopia (2001), Egypt (1998), Tanzania (2000) and Uganda (2000) liberalised their tariffs. These countries act as a 'treatment' group. In contrast, Cameroon, Gabon and Madagascar all left their tariffs unchanged. These countries act as our 'control' group or counterfactual. We compare the effects on imports for liberalising countries relative to non-liberalising countries, controlling for the timing of liberalisation, trends in import capacity (country effects) and in sector imports across countries (product market effects).

The remainder of this paper is set out in the following way. Section 2 discusses the data used and provides some descriptive statistics, in particular trends in imports and tariffs

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across the countries studied. Section 3 presents the Difference-in-Difference methodology. Section 4 reports the results and compares them to import demand elasticities estimated by Jones (2008). Section 5 concludes.

2. DATA AND SAMPLE

The data used is taken from the COMTRADE database and uses the Harmonised System. We classify the data according to the 15 specific sectors defined by the World Customs Organisation and two general sectors, Agriculture and Manufacturing. Industries are defined at the 2-digit HS level and aggregated into the 16 sectors (see Appendix Table A1).[1] For each industry we have data on import quantities, import values and import volumes weighted by value. Import value data is readily available, but the import quantity data is only available at the 6-digit level. This is transformed into a 2-digit classification by aggregating the 6-digit product lines. For the majority of 2-digit industries the quantity data is measured in kilograms, but for some sectors the measurement is defined by the number of items or by litres. For this reason the quantity data for each industry can be interpreted as industry-specific. This is not a problem as the quantity definitions are consistent across the years for each country.[2] In addition, data from the World Bank's World Development Indicators (WDI) on exports as a percentage of GDP and aid as a percentage of GNI are combined to use as a control variable to capture import capacity as access to foreign exchange.

Table 1 presents information on tariffs for each country and the estimation period used. For each country the estimation period varies due to data availability. For Egypt the estimation period is very small, only four years, whereas the sample for Uganda is much larger, a period spanning nine years from 1996 to 2004. As can be seen, five out of the eight countries liberalised their tariffs over the period, usually near the mid-point of our sample. The average 2-digit tariff across industries differs considerably across countries. Pre-liberalisation tariffs in Egypt are high at 47 per cent compared to a much

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[1] In Appendix 1 Table A1 there are 96 2-digit industries, a closer look shows that industries 77 and 91 are redundant.

[2] For all of the countries there is missing quantity data for various 2-digit industries. These industries are omitted from the subsequent analysis. The missing sectors are: Algeria: 91, 93, 97; Cameroon: 91, 97; CAR: 01, 02, 03, 04, 05, 06, 07, 08, 10, 11, 12, 13, 14, 15, 26, 41, 43, 45, 46, 47, 50, 60, 71, 75, 89, 91, 97; Ethiopia: 71, 91, 97; Egypt: 91, 97; Gabon: 71, 91, 97; Kenya: 91, 97; Madagascar: 91, 97; Tanzania: 91, 97; Uganda: 91, 97.

lower average in Uganda of 19 per cent. The extent of liberalisation of tariffs for each country is also quite different. Algeria's average tariff only fell by one percentage point, whilst Ethiopian tariffs fell by approximately 12 percentage points. It is also interesting that Madagascar (a control group country) had a very low average tariff across the period of just under seven per cent (implying that liberalisation has been implemented earlier, before the sample started).

Table 1: Sample Period and Average Tariffs Pre and Post Liberalisation

Country	Period	Date of Liberalisation	Average Tariff Pre Liberalisation	Average Tariff Post Liberalisation
Algeria	1996-2000	1997	26.67	25.61
Egypt	1996-1999	1998	47.34	34.22
Ethiopia	1997-2003	2001	32.73	21.04
Tanzania	1998-2002	2000	25.48	17.35
Uganda	1996-2004	2000	19.20	10.86
Cameroon	1996-2004		20.32	n/a
Gabon	1996-2004		20.17	n/a
Madagascar	1996-2004		6.51	n/a

Table 2: Import Values ($million, constant prices)

Country	1996	1997	1998	1999	2000	2001	2002	2003	2004
Algeria	7515.22	7607.27	8190.41	9095.59	9105.29				
Egypt	13967.17	13899.19	13306.09	13298.00					
Ethiopia		1263.17	1214.65	1132.96	1258.94	1254.46	1201.68	1256.41	
Tanzania			1757.28	1555.53	1584.95	1541.03	1521.90		
Uganda	1219.85	923.88	1200.54	1165.68	934.68	965.75	1490.07	1695.63	1532.38
Cameroon	1484.07	1479.23	1492.12	1486.12	1481.83	1489.28	1491.55	1489.59	1602.83
Gabon	886.73	847.97	1038.28	1018.68	946.54	950.93	952.92	871.66	817.40
Madagascar	946.09	810.53	790.77	675.97	937.10	885.38	938.39	887.97	1119.10

Table 3: Import Volumes (KG 000,000)

Country	1996	1997	1998	1999	2000	2001	2002	2003	2004
Algeria	11750.6	12562.3	12844.3	16382.1	16364.8				
Egypt	25934.96	26305.99	38798.10	35255.70					
Ethiopia		1137.47	3504.98	2283.66	1976.29	3418.11	2715.74	4243.69	
Tanzania			2203.63	1840.42	1645.11	1918.17	2063.72		
Uganda	1453.31	1391.86	3305.93	1181.89	1293.13	2162.21	2066.90	3242.04	1972.78
Cameroon	3084.95	3686.25	3771.65	3877.54	3620.43	4187.32	3884.96	3167.42	4151.14
Gabon	440.28	589.18	878.27	794.50	897.22	1104.83	710.93	1034.76	1182.57
Madagascar	1015.15	991.28	1002.59	930.67	1397.34	1380.05	1486.48	2042.27	2019.96

Tables 2 and 3 report imports defined in terms of value (in constant prices) and volume respectively. In terms of value it is not immediately apparent that imports increased over the period for each of the treatment group countries. For example, Tanzanian imports in 1998 were $1757 million compared to a figure of $1521 million in 2002. In addition, we also see a reduction in import values over the period for Egypt and Ethiopia. In general, the value of trade fluctuates; this is particularly noticeable for Uganda. The raw data does not suggest that liberalisation has caused a significant increase in the value of imports. There may however be a time lag. For the control group countries the value of trade appears to be fairly constant, especially for Cameroon.

The pattern of trade volumes is equally mixed across countries and over time. For some countries it increases over the period and for some it falls. There appears to be little visual evidence that tariff liberalisation has caused a dramatic increase in trade. It might be that tariff liberalisation has a limited impact on imports in African countries, as suggested in the studies discussed in the previous section. This proposition may be justified by the fairly inelastic price elasticity of import demand estimates reported by Jones (2008), which suggest that import surges (elastic responses) from price changes are fairly unlikely in African countries.

When we weight import volumes by value shares we again get similar patterns (Appendix Table A2). Nevertheless the elasticity estimates at the sectoral level demonstrate that some sectors may be more prone to import surges than others. For this reason the aggregate figure may hide some critical details.

3. DIFFERENCE-IN-DIFFERENCES METHODOLOGY

Difference-in-Differences (DiD) estimation is a useful econometric tool to answer policy questions where one can identify treatment and control groups. The methods are relatively uncomplicated, and unburdened by the subjective confines of structural economic theory, but potentially rich and informative. The impact of tariff reductions on import levels has not, to our knowledge, been modelled in the literature at the sector/country level using DiD techniques. Two previous studies that take advantage of the DiD approach to address somewhat related issues are Frazer and van Biesebroek (2007), who look at the growth in trade under the African Growth and

Opportunity Act (AGOA), and Kneller (2007) who looks at the impact of trade and fiscal policy on economic growth. Although these studies do not investigate the impact of trade liberalisation on imports, the methodologies used are directly relevant to the subsequent analysis. We therefore include a brief discussion of their work.

Kneller (2007) uses the approach to consider whether the rate of growth following trade liberalisation in 'liberalising countries' differs significantly from growth in other 'non-liberalising' developing countries. He takes advantage of two measures of liberalisation, Dean *et al* (1994) and Sachs and Warner (1995, as updated by Wacziarg and Welch, 2003). Because these measures do not correspond exactly to one another he splits his sample into three five year periods, the five year period before liberalisation, the five year period during liberalisation and the five year period post liberalisation. By assigning time dummies that equal unity for the liberalising countries for the five year periods during and post liberalisation it is possible to determine whether liberalisation had any impact on growth relative to the initial five year period. The results suggest that the difference in growth between liberalising countries and non- liberalisers is negligible. This is robust across the two measures of liberalisation and when a smaller set of control group countries are used.

Frazer and van Biesebroek (2007) use DiD techniques to analyse the trade effects in African countries of the African Growth and Opportunity Act (AGOA). AGOA was introduced by the US government in 2000 and consists of a set of trade concessions on a broad list of products. Because the list of concessions was applied selectively to both countries and products, but not to all countries, nor to all products, in the same year, the implementation allows for triple DiD estimation of the impact of the policy. The authors find that the scheme significantly increased AGOA-eligible African country exports relative to non-eligible exports, particularly in the apparel sector, despite the AGOA product list being chosen so as not to include a series of "sensitive products". The use of the triple DiD approach controls for both country and product-level effects at the time of onset. This method is chosen to address the endogeneity critique implicit in DiD analysis.[3] Because the data used in this study is classified

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[3] The authors use the following example of the endogeneity critique: 'At the country-level, suppose that countries were given AGOA-eligibility just as their economies started to improve. This might result in an increase in US imports from this country at the same time as the country gained eligibility,

across three dimensions - time, industries and countries - it is directly relevant to our analysis. Our panels will be set up in a similar fashion and we also take advantage of the three fixed effects variables used in their study. These will be discussed in more detail below.

Our aim is to assess if the liberalisation (reduction) of tariffs has had any discernable impact on imports in a sample of African countries. Any standard trade model would predict that trade liberalisation, applied to products that African countries were either already importing or to products that they should import given their lack of comparative advantage, should cause the volume of imports to increase for normal goods.[4] For this reason no formal model is presented, as this prediction would apply to a very wide class of models. The simplest DiD specification is the following:

$$\ln IMP_{cit} = \alpha + \beta\left(D_t \times D_c\right) + \varepsilon_{cit} \tag{1}$$

where the dependent variable refers to the logarithm of imports, measured by either import volumes,[5] the value deflated by an import price deflator (base year 2000) or by the volume weighted by trade share value,[6] into country c of product i in time t. The independent variable is an interaction term composed of the product of two dummy variables. The variable D_c is a time invariant dummy that takes the value of one if a country has liberalised its tariffs and zero otherwise; this variable distinguishes between the treatment group country and the control group countries. The variable D_t is a variable that switches from zero to one for the treated country's industries in the year of, and then after, trade liberalisation. In summary, the interacted dummy variable equals one (zero) for each product line if: i) the country is a liberaliser (non-

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although the imports might just result from the overall boost in the exporter's economy. The country-by-country DiD estimator would erroneously attribute the positive export effect to AGOA' (Frazer and van Biesebroeck, 2007, p3).

[4] Domestic import-competing producers may respond by increasing productivity and competitiveness. In an African context, this is unlikely to occur immediately and, even if it does occur, it would dampen rather than eliminate an import increase.

[5] Volume is generally measured in kilograms (Kg), but for some products the volume measure is sector specific as in Jones (2008).

[6] To calculate Import Volumes weighted by values we use the following formula:

$$QW_{itc} = Q_{itc} \times \left[\frac{V_{itc}}{\sum_i V_{itc}}\right]$$

Where QW is the import volume weighted by trade share value, Q is the volume of imports and V is the value of imports for product i in time t and country c.

liberaliser) and ii) for the period of time when liberalisation has occurred (not occurred). The coefficient β therefore tells us in percentage terms how much imports are greater or less for the treatment group country as opposed to the control group countries.

The intuition behind this specification can best be seen when only two years are considered, one year prior to liberalisation, for example 2000, and a second year when liberalisation has taken place, for example 2001.[7] The implementation of trade liberalisation contains variation along two dimensions, between time periods (pre and post) and between countries. Therefore if we do the analysis for just one industry, for example *01 Live Animals*, the DiD approach used to measure the effect of liberalisation is:

$$DID = \underbrace{(LnIMP_{2001}^{01} - LnIMP_{2000}^{01})}_{TradeLiberaliser} - \underbrace{(LnIMP_{2001}^{01} - LnIMP_{2000}^{01})}_{NonLiberaliser} \qquad (2)$$

The use of the interacted dummy variables in the empirical specification of equation (1) puts into effect that of equation (2) for all sectors. Equation (2) gives a greater feel for the intuition behind the parameter β. Nevertheless, the specification of equation (1) is very restrictive, it does not allow for much country or product-level heterogeneity. A more general specification is:

$$\ln IMP_{cit} = \alpha_0 + \alpha_1 F_1 + \alpha_2 F_2 + \alpha_3 F_3 + \beta(D_t \times D_c) + \delta MC + \varepsilon_{cit} \qquad (3)$$

where the additional variables represent fixed effects (with variables measured in logs). F_1 is the base level of import volumes of product i for country c, F_2 is the total volume of imports of product i for all c in time t and F_3 is the total volume of imports to country c in time t (for all i). These fixed effects capture initial conditions, product-specific factors and country-specific factors respectively, and are used for the volume

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[7] With this example we are assuming all the countries liberalised in the same year. This is not the case in reality. Nevertheless the example gives a feel for the DID approach.

and volume-weighted models. For the models that use import values: F_1 is the base level of the value of imports of product i for country c, F_2 is the total value of imports of product i in time t (for all c), and F_3 is the total value of imports to country c in time t (for all i)[8]. The coefficient estimates for each of the fixed effects variables are predicted to be positive. The logarithm of Import Capacity (*MC*) is considered as the availability of foreign exchange and is the sum of Exports as a percentage of GDP and Aid as a percentage of GNI.[9] As with the fixed effects variables, the coefficient estimate for import capacity is also predicted to be positive.

Equation (3) is estimated separately for each treatment group country. For example, the DiD parameter for Algeria is measured relative to the three control group countries. In addition to the general DiD parameter for each treatment group country, we estimate equation (3) separately for each of the 15 sectors (in which we estimated elasticities - see Jones (2008)), and the broad sectors of Agriculture and Manufacturing. All of the models include the fixed effects and import capacity variable as controls. Table 4 identifies the sectors.

Table 4: Sector Codes.

Sector	Product Description	Sector	Product Description
1	Live Animals.	9	Footwear, Headgear etc.
2	Vegetable Products.	10	Stones, Pearls.
3	Beverages & Tobacco.	11	Metals.
4	Mineral Fuels.	12	Machinery Mechanical Appliances.
5	Chemicals.	13	Vehicles.
6	Rubber & Hides.	14	Precision Instruments.
7	Woods.	16	Miscellaneous Manufactures.
8	Textiles.		

Note: Sector 15 Arms & Munitions has been dropped due to limited data.

4.   RESULTS

For each treatment group country a balanced panel, across time and industries, is constructed which includes the data for the treatment group country and the three control group countries. In addition, balanced panels are created separately to estimate

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[8] The construction of each of the fixed effects variables is the same for each sample, but the actual calculation will differ because the sample size varies and the treatment country is different in each sample. For the product market fixed effect F2 a combination of all countries may have been more reliable. However this is not possible due to insufficient data.

[9] Although GNI differs from GDP this is not really a problem as the variable is only a proxy measure.

the DiD for each of the 15 specific sectors defined by the World Customs Organisation, and the general sectors: Agriculture and Manufacturing. Industries are defined at the 2-digit level and are presented in Appendix 1. In this section we first report the results of the general model for each treatment group country. We then present the results for the individual sectors, and the general sectors Agriculture and Manufacturing, on a country by country basis. For the general model, we report the results using import values (which are already implicitly weighted) and import volumes as the dependent variable, relegating the import-weighted volume results to Appendix 2. For the sector estimates we report the results for each of the three measures of imports; we also include the elasticities estimated by Jones (2008) and the percentage change in the average tariff for each sector.

General Model

Table 5 presents the results of estimating equation (3) for each country using import values. Virtually all of the fixed effects variables are positive and statistically significant as expected. In addition, the coefficient estimate for import capacity is also positive and significant for each country. The DiD parameter estimate is only positive and significant for Ethiopia and suggests that import values in Ethiopia were 40 per cent higher relative to the three control group countries. The results for the other liberalising countries suggest that imports overall were no higher than the non-liberalising countries. It would appear therefore that tariff liberalisation in these African countries has had no discernable impact on imports controlling for initial conditions, product specific factors, country specific factors and import capacity. Indeed, the significant negative DiD coefficient for Algeria suggests that imports were 15 per cent lower than would have been expected. It should be noted that in this case the average tariff reduction was very small and occurred early in the period of observations.

Table 5: Country Results (Import Values)

	Algeria	Egypt	Ethiopia	Tanzania	Uganda
F1 (base)	0.751***	0.860***	-0.0907	-0.0762*	0.613***
	0.028	0.026	0.084	0.045	0.024
F2 (product)	0.237***	0.122***	0.716***	0.801***	0.398***
	0.028	0.026	0.026	0.032	0.026
F3 (country)	0.349***	0.227***	0.349***	0.204***	0.584***
	0.036	0.035	0.03	0.035	0.07
MC	0.210***	0.208***	0.184***	0.183**	0.150***
	0.071	0.077	0.059	0.08	0.053
DiD	-0.154***	-0.019	0.402***	0.0698	-0.0157
	0.058	0.05	0.074	0.083	0.05
Constant	-8.495***	-5.614***	-10.61***	-4.518**	-13.53***
	0.96	0.99	1.7	1.89	1.58
Observations	1834	1467	2566	1839	3302
R-squared	0.92	0.94	0.89	0.92	0.89

Notes: *** indicates significant at the 1 percent level

Table 6: Country Results (Trade Volume)

Country	Algeria	Egypt	Ethiopia	Tanzania	Uganda
F1 (base)	0.758***	0.867***	0.695***	0.751***	0.598***
	0.031	0.029	0.029	0.031	0.024
F2 (product)	0.220***	0.123***	0.348***	0.249***	0.409***
	0.031	0.029	0.034	0.035	0.027
F3 (country)	0.269***	0.222***	0.122**	0.122**	0.345***
	0.038	0.045	0.049	0.061	0.043
MC	0.489***	0.553***	-0.12	-0.153	0.270***
	0.12	0.14	0.086	0.12	0.085
DiD	-0.0375	0.0525	0.438***	0.247***	-0.0308
	0.07	0.078	0.12	0.056	0.074
Constant	-7.611***	-6.778***	-3.419***	-2.551	-9.002***
	1.2	1.5	1.3	1.62	1.15
Observations	1834	1467	2565	1839	3301
R-squared	0.92	0.94	0.84	0.89	0.84

Notes: *** indicates significant at the 1 percent level

Table 6 presents the results of estimating equation (3) for each country using import volumes as the definition of imports. All of the fixed effects variables are again positive and significant. The parameter estimate for the import capacity variable is also significant for three of the five countries. The DiD parameter estimate for Ethiopia is again positive and significant at 0.44 suggesting that import volumes were

considerably higher in Ethiopia relative to the control group countries. In addition, the DiD parameter estimate for Tanzania is also significant at 0.25. For the other three countries the DiD parameter is statistically insignificant. This again suggests that tariff liberalisation is not having a significant impact on imports relative to the control group countries.

The results for imports defined by the volume-weighted measure are reported in Table A2 in Appendix 2. The results are fairly mixed and again show limited evidence that tariff liberalisation had a significant impact on imports for the treatment group countries relative to the control group countries. The majority of fixed effects variables are positive and significant, the exception being F3, and the import capacity variable is generally statistically insignificant. The DiD parameter is again positive for Ethiopia (0.420) but is actually negative for Algeria, Tanzania and Uganda. This suggests that liberalisation actually resulted in a decline in imports relative to the control group countries (this may be an effect of the weighting applied, suggesting product-specific exceptions).

Ethiopia

Table 7 presents the sector results for Ethiopia and for comparison includes the elasticities estimated by Jones (2008). Ethiopia was the only country that reported a positive and significant DiD parameter estimate – approximately 40 percent greater imports relative to the control group countries. By looking at the sector results we can determine the sectors behind this relative difference. When imports are defined by trade value the general sectors Agriculture and Manufacturing fail to demonstrate any difference in imports between Ethiopia and the control group countries. This observation is contradicted somewhat by the volume measure and the weighted volume measure. As can be seen, the DiD parameter estimate for Manufacturing is 0.478 (volume weighted) almost identical to the general result above.

Table 7: Ethiopia Sector Results

Sector	Trade Value	Trade Volume	Volume Weighted	Elasticity	% Change in Av Tariff
Agriculture	-0.134	0.186	-0.144	n/a	-32
Manufacturing	-0.101	0.489***	0.478**	n/a	-43
1. Live Animals	-0.390*	-0.183	-0.812	-1.752***	-45
2. Vegetable Products	-0.130	-0.038	-0.310	-1.879***	-35
3. Beverages & Tobacco	0.216	0.777***	0.890**	-1.309***	-48
4. Mineral Products	-1.345**	-1.427	-2.545*	-2.106***	-33
5. Chemicals	0.0297	0.418***	0.399*	-0.664***	-34
6. Rubber & Hides	-0.406**	0.263	0.021	-2.346***	-21
7. Woods & Paper	0.770***	1.215***	2.017***	-1.792***	-43
8. Textiles	-0.066	0.524	0.765	-1.144***	-38
9. Footwear & Headgear	0.275**	0.987***	1.355***	-1.439***	-38
10. Stones, Pearls, Glass	-0.226***	0.463***	0.385**	-1.196***	-28
11. Base Metals	-0.266*	0.016	-0.575	-2.050***	-11
12. Machinery & Electrical	-0.212***	0.651*	0.415	1.344***	-18
13. Vehicles & Transport	-0.088	1.966***	2.257***	-0.996***	-21
14. Precision Instruments	0.275***	1.335***	2.331***	-0.782***	-02
16. Misc Manufactures	-0.0489	0.0747	0.207	-0.375**	-34

Notes: *** indicates significant at the 1 percent level; ** indicates significant at the 5 percent level; * indicates significant at the 10 percent level.

The individual sector results indicate the sectors that are driving the general result; they also demonstrate a lot of variation. Six out of the fifteen sectors, when imports are defined by value, report insignificant estimates. This suggests that there is no discernable difference in imports in these sectors relative to the corresponding sectors of the control group countries. The other nine sectors report significant estimates but for six of them the sign of the DiD is negative. This is particularly true for the *Mineral Fuels* sector with an estimate of -1.345. The sectors that report a positive DiD are *Woods and Paper Products*, *Footwear and Headgear*, *and Precision Instruments*.

When imports are defined by weighted volumes we again get mixed results. Eight of the sectors report significant results. This time only the *Mineral Fuels* sector reports a negative DiD of -2.545. All of the other sectors are positive, notably *Vehicles and Transport* 2.257, *Precision Instruments* 2.331 and *Woods and Paper Products* 2.017. When imports are defined by the volume measure there are eight sectors that report significant and positive estimates. There are no sectors that have negative and significant estimates. The highest estimate is again for *Vehicles and Transport* 1.966 and *Woods and Paper Products* 1.215.

For Ethiopia there does appear to be a significant difference in imports relative to the non-liberalising countries. The DiD appears to be driven by manufacturing imports, particularly from the *Woods and Paper Products* sector and the *Precision Instruments* sector. Nevertheless there do appear to be sectors where the liberalisation of tariffs has had no discernable impact on imports relative to the control group countries.

Interestingly, there appears to be no clear relationship between the sectors with the most significant results and their corresponding elasticity and percentage change in tariffs. For Ethiopia the majority of elasticity estimates are fairly elastic so one would expect tariff liberalisation to have a positive impact on all sectors. Two factors might explain why the DiD for each sector does not correspond to the elasticities. Firstly, sector-specific factors other than price may be having an impact on imports. Secondly, the DiD does not take into account the actual change in sector tariffs (it just classifies sectors that have liberalised); some sectors may have experienced much greater price reductions than others. Although, as noted, there is no consistent relationship between the increase in imports and the percentage reduction in tariffs, there is a far from perfect correlation between percentage change in tariffs and percentage change in import prices.

Tanzania

The sector results for Tanzania are reported in Table 8. The DiD estimate for the general model above found little evidence that liberalisation in Tanzania had a significant impact on import values, but there does appear to be an impact on import volumes. The individual sector results add additional support to these findings. The DiD parameter estimate for Agriculture is significant but negative for the value and

volume weighted methods of measuring imports. This suggests that imports of agricultural goods fell, post liberalisation, relative to the control group countries. The DiD parameter estimate for Manufacturing was only significant (and positive) for the volume measure.

The individual sector results compound the results of Manufacturing and Agriculture for each of the three measures of imports. When imports are defined by value, only three of the fifteen sectors report significant results; two of these estimates are negative. The only sector that has a significant and positive result is Sector 10 *Stones, Pearls and Glass*. A similar pattern emerges for the volume weighted measure of imports. Only five sectors report significant results; and again it is only the *Stones, Pearls and Glass* that reports a positive DiD.

Nevertheless, in a similar fashion to Ethiopia the results for the volume measure again provide a more comprehensive set of significant and positive DiD parameter estimates. Seven out of the fifteen estimates are positive. The estimate for the *Stones, Pearls and Glass* sector of 0.711 is again the highest, but other notable sectors include *Rubber & Hides* 0.621, *Base Metals* 0.588 and *Machinery & Electrical Equipment* 0.474.

Table 8: Tanzania Sector Results

Sector	Trade Value	Trade volume	Volume Weighted	Elasticity	% Change in Av Tariff
Agriculture	-0.270***	0.042	-0.670***	n/a	-17
Manufacturing	-0.012	0.322***	-0.053	n/a	-47
1. Live Animals	-0.224	-0.132	-1.016*	-2.042***	-37
2. Vegetable Products	-0.168	0.333*	-0.357	-2.320***	-45
3. Beverages & Tobacco	-0.368***	-0.127	-0.796***	-1.086***	-31
4. Mineral Products	0.178	-0.165	-0.007	-0.818***	-74
5. Chemicals	0.085	0.410***	0.173	-0.752***	-44
6. Rubber & Hides	-0.056	0.621**	0.221	-1.410***	-51
7. Woods & Paper	0.150	0.249*	-0.156	-0.743***	-60
8. Textiles	0.016	0.231	-0.123	-1.498***	7
9. Footwear & Headgear	0.154	0.404***	0.117	-2.222***	-11
10. Stones, Pearls, Glass	0.128*	0.711***	0.584***	-1.340***	-14
11. Base Metals	0.017	0.588***	0.215	-1.539***	-34
12. Machinery & Electrical	-0.003	0.474**	0.337	1.416***	-22
13. Vehicles & Transport	-0.513***	0.190	-0.003	-0.582***	-44
14. Precision Instruments	-0.182	-0.0714	-0.616*	-0.902***	-3
16. Misc Manufactures	-0.0974	-0.0894	-0.618***	-0.292	-12

Notes: As for Table 7.

Table 9: Uganda Sector Results

Sector	Trade Value	Trade Volume	Volume Weighted	Elasticity	% Change in Av Tariff
Agriculture	0.076	0.289**	0.184	n/a	-42
Manufacturing	-0.048	-0.135	-0.545***	n/a	-48
1. Live Animals	-0.338*	0.215	-0.118	-2.210***	-33
2. Vegetable Products	0.370**	0.479**	0.653*	-1.953***	-55
3. Beverages & Tobacco	0.030	0.137	-0.235	-0.842***	-49
4. Mineral Products	-0.342	-0.728	-0.956	-1.708***	-29
5. Chemicals	0.152***	0.126**	0.050	-0.159	-40
6. Rubber & Hides	0.12	0.289*	0.0207	-1.502***	-47
7. Woods & Paper	-0.252	-0.241	-0.834*	-1.242***	-39
8. Textiles	-0.309*	-0.609***	-1.263***	-2.039***	-31
9. Footwear & Headgear	0.211**	0.206	0.074	-1.237***	-50
10. Stones, Pearls, Glass	0.059	0.363***	0.176	-1.307***	-32
11. Base Metals	-0.169	-0.337*	-1.151***	-1.900***	-41
12. Machinery & Electrical	0.190**	0.579*	0.599*	0.459**	-70
13. Vehicles & Transport	-0.091	0.189	0.475	-0.928***	-72
14. Precision Instruments	0.550***	0.224	-0.194	-1.340***	-58
16. Misc Manufactures	0.113	-0.284	-0.463	-0.566***	-43

Notes: As for Table 7.

Uganda

The results for Uganda are reported in Table 9. As with Tanzania the general model DiD not show a significant difference in imports post liberalisation relative to the control group countries. This is true even though the sample size is larger compared to all of the other countries. The results for the general sectors Agriculture and Manufacturing also report insignificant estimates, except when imports are measured by the trade volume and the volume weighted measure. The DiD estimate for Manufacturing using the weighted definition is significant at the 1 percent level but

again it is negative. The DiD estimate for Agriculture using the volume measure is significant and positive at 0.289.

The individual sector results report a greater number of significant estimates than for Tanzania when imports are defined by trade value and the weighted volume measure. For the trade value method of classifying imports five sectors report positive DiD estimates, the two highest being *Vegetable Products* 0.37 and *Precision Instruments* 0.55. The estimates for the volume measure appear to match the value measure. Only two other sectors report significant results using the volume measure. Interestingly the *Machinery and Electrical Equipment* sector reports positive estimates for all three methods at 0.190, 0.579 and 0.599 respectively. As with Ethiopia and Tanzania, the results don't appear to have any consistent relationship with the elasticity estimate and the percentage change in average tariffs.

Algeria

The results for Algeria are reported in Table 10. We again obtain a series of insignificant and negative estimates. For the trade value measure only two sectors report positive and significant estimates. Not even one of the sectors reports a positive and significant result for the weighted measure. This can only mean that imports fell relative to the non-liberalising countries post trade liberalisation in Algeria. Additional support for this finding is also seen when imports are defined by volume alone. Only three of the fifteen sectors report positive and significant results.

Table 10: Algeria Sector Results

Sector	Trade Value	Volume Weighted	Trade Volume	Elasticity	% Change in Av Tariff
Agriculture	-0.154***	-1.403***	-0.038	n/a	-05
Manufacturing	-0.369***	-0.271	-0.730***	n/a	0
1. Live Animals	-0.072	-1.542*	0.215***	-1.808***	13
2. Vegetable Products	-0.956**	-1.875***	-1.038**	-2.370***	18
3. Beverages & Tobacco	-0.479**	-0.860**	-0.761***	-1.577***	-14
4. Mineral Products	0.116	-1.565	-0.520**	-1.338***	0
5. Chemicals	-0.618	-0.370	-0.600	-0.653***	4
6. Rubber & Hides	0.132	0.199	0.0403	-2.261***	-5
7. Woods & Paper	0.120	-0.350	0.303	-2.268***	-17
8. Textiles	-0.347**	0.299	0.185	-1.684***	-8
9. Footwear & Headgear	0.225*	-0.110	0.540***	-1.987***	-13
10. Stones, Pearls, Glass	0.200	-0.054	0.374**	-1.150***	-05
11. Base Metals	-0.031	-0.921***	0.059	-1.729***	4
12. Machinery & Electrical	-0.377**	0.030	-0.163	0.874***	2
13. Vehicles & Transport	0.136	0.546	-0.016	-0.777***	5
14. Precision Instruments	-0.447	0.085	0.781	-1.118***	7
16. Misc Manufactures	0.595*	-1.478	-0.046	-0.225	-10

Notes: As for Table 7.

Egypt

The results for Egypt are reported in Table 11. As with all the other countries, except Ethiopia, the DiD for each of the sectors is generally insignificant. This is true across all three methods of classifying imports. Only three sectors report positive and significant estimates when imports are defined by volume and value; for the latter these are *Mineral Fuels* 0.562, *Footwear and Headgear* 0.550 and *Miscellaneous Manufactures* 0.155. When imports are defined by volumes weighted all of the estimates, bar one, are statistically insignificant.

Table 11: Egypt Sector Results

Sector	Trade Value	Trade Volume	Volume Weighted	Elasticity	% change in Av Tariff
Agriculture	-0.124*	-0.060	-0.275		-25
Manufacturing	0.0174	0.095	-0.017		-25
1. Live Animals	-0.116	-0.345	-0.275	-0.174	-24
2. Vegetable Products	-0.225**	-0.019	-0.583**	-2.372***	-22
3. Beverages & Tobacco	0.008	0.0901	0.117	-1.412***	-29
4. Mineral Products	0.562**	0.770	0.999	-1.534***	-10
5. Chemicals	0.065	0.333*	0.151	-0.926***	-12
6. Rubber & Hides	0.0125	-0.326	-0.253	-2.569***	-28
7. Woods & Paper	-0.087	-0.233	-0.596	-2.520***	-29
8. Textiles	-0.183	-0.115	-0.290	-1.795***	-24
9. Footwear & Headgear	0.550***	0.0741	0.248	-2.546***	-42
10. Stones, Pearls, Glass	0.010	0.014	-0.033	-1.074***	-27
11. Base Metals	-0.136	0.214*	-0.119	-1.855***	-13
12. Machinery & Electrical	0.061	-0.135	-0.034	0.436***	-61
13. Vehicles & Transport	-0.079	-0.012	-0.320	-1.727***	-14
14. Precision Instruments	-0.089	0.119	-0.190	-1.094***	-07
16. Misc Manufactures	0.155*	0.251*	0.370	-1.180***	-35

Notes: As for Table 7.

5. CONCLUSION

This chapter has used Difference-in-Difference analysis to determine whether imports significantly increased, post liberalisation, in six African countries relative to three control group countries - Madagascar, Cameroon and Gabon. Overall, using three methods of measuring imports, there is little evidence that suggests imports increased. This is true at the general level and when the sample is split up into individual sectors. The only country that is an exception to the above is Ethiopia. For Ethiopia there does

appear to be a fairly robust DiD of approximately 40 percent across the three methods of measuring imports. In addition, there is also some evidence particularly using the volume measure, that certain sectors do appear to have a positive DiD. Quite often the coefficient estimates are negative, and most often they are insignificant and are not robust across the three methods of measuring imports.

We compare the estimated DiD effects for each country and sector with the import price elasticities of demand for the same sector classifications estimated by Jones (2008). Using fixed effects, the aggregate elasticity for each country was not significantly different to unity in absolute value. This suggests that significant import surges, post liberalisation, are unlikely. However, elasticity estimates at the sector level had much more variation: some sectors reported much higher estimates than others. For this reason import surges, post liberalisation, may be sector-specific. The DiD analysis allows us to assess if import surges actually resulted from tariff liberalisation and if these surges are what would have been predicted by the elasticity estimates. The simple answer is no: there is no evidence for surges, and the sectors in which imports increased did not obviously have the most price elastic demand.

These findings are fairly surprising given the relatively elastic import demand estimates for the sectors generated by Jones (2008) and the high percentage change in sector tariffs. The elasticities predicted that imports for some sectors may be fairly responsive to changes in price; yet we have found limited evidence for this. Various factors may account for these results. The first factor is the matching of the treatment group countries to the control group countries. By choosing three countries as our control group we hoped that differences in economic structure would be averaged out – this may not be the case. Secondly the data available for each country varies substantially, for Egypt we only have four years of observations, there may thus be a time-lag that we have failed to account for. In fact, a delayed effect of tariff reductions is a possibility we cannot discount for any countries. Thirdly, it might be that the variability of the elasticities estimated by Jones (2008) might be due to unit prices, which exhibit greater variability than tariffs. Tariff changes tend to occur in one-off time periods causing less volatility and uncertainty. Finally, there may be other factors that we have not accounted for having a significant impact on import demand relative to the control group countries.

There are a number of reasons why SSA imports may not be responsive to tariff reductions: import capacity is largely determined by factors other than tariffs (or even import prices), tariffs are only one element of prices and trade costs may be very high even after tariffs are reduced. African producers face particularly high trade costs (Commission for Africa, 2005: page 262). Transport costs, in particular, are a major component of trade costs and higher in SSA than other parts of the world, constraining the response of imports and exports to trade policy (Milner *et al*, 2000). Trade facilitation (such as streamlining Customs procedures) could reduce the high trade costs faced by African producers (Milner *et al*, 2008), but has yet to be implemented to a significant degree. While this can benefit exporters, the most immediate effect would be to reduce the costs of importing as trade costs are a 'natural' barrier that protect import-competing sectors and tax exports. Our results do support the argument that high trade costs offer natural protection, limiting increases in African exports (and effectively taxing exports).

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APPENDIX 1: NOMENCLATURE.

Table A1: Nomenclature.

Sector	Industry	Industry Description
Sector 1	01	Live animals.
	02	Meat and edible meat offal.
	03	Fish and crustaceans, molluscs and other aquatic invertebrates.
	04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included.
	05	Products of animal origin not elsewhere specified or included.
Sector 2	06	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage.
	07	Edible vegetables and certain roots and tubers.
	08	Edible fruit and nuts; peel of citrus fruit or melons.
	09	Coffee, tea, maté and spices.
	10	Cereals.
	11	Products of the milling industry; malt; starches; insulin; wheat gluten.
	12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder.
	13	Lac; gums, resins and other vegetable saps and extracts.
	14	Vegetable plaiting materials; vegetable products not elsewhere specified or included.
	15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes.
Sector 3	16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates.
	17	Sugars and sugar confectionery.
	18	Cocoa and cocoa preparations.
	19	Preparations of cereals, flour, starch or milk; pastry cooks' products.
	20	Preparations of vegetables, fruit, nuts or other parts of plants.
	21	Miscellaneous edible preparations.
	22	Beverages, spirits and vinegar.
	23	Residues and waste from the food industries; prepared animal fodder.
	24	Tobacco and manufactured tobacco substitutes.
Sector 4	25	Salt; sulphur; earths and stone; plastering materials, lime and cement.
	26	Ores, slag and ash.
	27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes.
Sector 5	28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes.
	29	Organic chemicals.
	30	Pharmaceutical products.
	31	Fertilisers.
	32	Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring matter; paints and

		varnishes; putty and other mastics; inks.
	33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations.
	34	Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial waxes, prepared waxes, polishing or scouring preparations, candles and similar articles, modelling pastes, "dental waxes" and dental preparations with a basis of plaster.
	35	Albuminoidal substances; modified starches; glues; enzymes.
	36	Explosives; pyrotechnic products; matches; pyrophoric alloys; certain combustible preparations.
	37	Photographic or cinematographic goods.
	38	Miscellaneous chemical products.
Sector 6	39	Plastics and articles thereof.
	40	Rubber and articles thereof.
	41	Raw hides and skins (other than fur skins) and leather.
	42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (other than silk-worm gut).
	43	Fur skins and artificial fur; manufactures thereof.
Sector 7	44	Wood and articles of wood; wood charcoal.
	45	Cork and articles of cork.
	46	Manufactures of straw, of esparto or of other plaiting materials; basket ware and wickerwork.
	47	Pulp of wood or of other fibrous cellulosic material; recovered (waste and scrap) paper or paperboard.
	48	Paper and paperboard; articles of paper pulp, of paper or of paperboard.
	49	Printed books, newspapers, pictures and other products of the printing industry; manuscripts, typescripts and plans.
Sector 8	50	Silk.
	51	Wool, fine or coarse animal hair; horsehair yarn and woven fabric.
	52	Cotton.
	53	Other vegetable textile fibres; paper yarn and woven fabrics of paper yarn.
	54	Man-made filaments.
	55	Man-made staple fibres.
	56	Wadding, felt and non-woven; special yarns; twine, cordage, ropes and cables and articles thereof.
	57	Carpets and other textile floor coverings.
	58	Special woven fabrics; tufted textile fabrics; lace; tapestries; trimmings; embroidery.
	59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for industrial use.
	60	Knitted or crocheted fabrics.
	61	Articles of apparel and clothing accessories, knitted or crocheted.
	62	Articles of apparel and clothing accessories, not knitted or crocheted.
	63	Other made up textile articles; sets; worn clothing and worn textile articles; rags.
Sector 9	64	Footwear, gaiters and the like; parts of such articles.

	65	Headgear and parts thereof.
	66	Umbrellas, sun umbrellas, walking-sticks, seat-sticks, whips, riding-crops and parts thereof.
	67	Prepared feathers and down and articles made of feathers or of down; artificial flowers; articles of human hair.
Sector 10	68	Articles of stone, plaster, cement, asbestos, mica or similar materials.
	69	Ceramic products.
	70	Glass and glassware.
	71	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal and articles thereof; imitation jewellery; coin.
Sector 11	72	Iron and steel.
	73	Articles of iron or steel.
	74	Copper and articles thereof.
	75	Nickel and articles thereof.
	76	Aluminium and articles thereof.
	78	Lead and articles thereof.
	79	Zinc and articles thereof.
	80	Tin and articles thereof.
	81	Other base metals; cermets; articles thereof.
	82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal.
	83	Miscellaneous articles of base metal.
Sector 12	84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof.
	85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles.
Sector 13	86	Railway or tramway locomotives, rolling-stock and parts thereof; railway or tramway track fixtures and fittings and parts thereof; mechanical (including electro-mechanical) traffic signalling equipment of all kinds.
	87	Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof.
	88	Aircraft, spacecraft, and parts thereof.
	89	Ships, boats and floating structures.
Sector 14	90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; parts and accessories thereof.
	91	Clocks and watches and parts thereof.
	92	Musical instruments; parts and accessories of such articles.
Sector 15	93	Arms and Munitions etc.
Sector 16	94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps and lighting fittings, not elsewhere specified or included; illuminated signs, illuminated name-plates and the like; prefabricated buildings.
	95	Toys, games and sports requisites; parts and accessories thereof.
	96	Miscellaneous manufactured articles.

APPENDIX 2: TRADE WEIGHTED RESULTS

Table A2: Trade Weighted Volume Results (General Model).

	Algeria	Egypt	Ethiopia	Tanzania	Uganda
F1 (base)	1.428***	1.611***	1.294***	1.388***	1.102***
	0.051	0.048	0.053	0.053	0.038
F2 (product)	0.251***	0.0686	0.514***	0.373***	0.670***
	0.053	0.049	0.062	0.06	0.043
F3 (country)	-	-	-	-0.246**	0.182**
	0.312***	0.569***	0.225***		
	0.077	0.085	0.087	0.1	0.075
MC	0.0714	-0.241	-0.0615	-0.102	0.558***
	0.24	0.29	0.17	0.24	0.15
DiD	-	-0.108	0.420*	-0.221*	-
	0.584***				0.372***
	0.16	0.16	0.22	-0.11	0.13
Constant	-	-2.555	-	-11.97***	-
	9.608***		13.41***		23.78***
	2.39	2.84	2.33	2.83	2
Observations	1834	1467	2565	1839	3301
R-squared	0.88	0.91	0.83	0.88	0.84

Notes: *** indicates significant at the 1 percent level