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Comments Welcome

AGOA Rules: The intended and unintended development consequences of Special Fabric Provisions

By

By Lawrence Edwards and Robert Lawrence.[1]

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ABSTRACT

Lesotho and other least developed African countries responded to the preferences they were granted under the African Growth and Opportunities Act with a rapid increase in their clothing exports to the US. But this performance has not been accompanied by the dynamic growth benefits that might have been hoped for. Moreover, the end of the Multifiber Arrangement has had particularly adverse effects on these countries. In this study we develop the theory and present empirical evidence to demonstrate that these outcomes are the predictable consequences of the manner in which the specific preferences should be expected to work.

The MFA quotas created a favorable environment for low value-added, fabric-intensive clothing production in countries with unused quotas by inducing constrained countries to move into higher quality products. By allowing the least developed African countries to use third country fabrics in their clothing exports to the US, AGOA provided additional implicit effective subsidies to clothing that were multiples of the US tariffs on clothing imports. Taken together, these policies help account for the program's success and demonstrate the importance of other rules of origin in preventing poor countries from taking advantage of other preference programs.

But the disappointments can also be attributed to the preferences because they discouraged additional value-addition in assembly and stimulated the use of expensive fabrics that were unlikely to be produced locally. When the MFA was removed, constrained countries such as China moved strongly into precisely the markets in which AGOA countries had specialized. Preference erosion due to MFN reductions in US clothing tariffs could similarly have particularly severe adverse effects on these countries.

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AGOA Rules: The intended and unintended development consequences of Special Fabric Provisions.

The export performance of the small, land-locked nation of Lesotho is an African success story that demonstrates both the power and limitations of trade preferences. In 2004, just three years after Lesotho became eligible for preferences under the Africa Growth and Opportunities Act (AGOA) the clothing exports to the US from one of Africa's poorest land-locked nations had trebled to reach $460 million and provide employment for over 50,000 workers.[2] The performance of Lesotho and several other preference recipients was particularly striking because it seemed to contradict the pessimistic verdict many had reached about Africa's capacity to become a globally competitive exporter of manufactured products even when granted preferential market access.[3]

On May 12 2010, a ceremony was held on Capitol Hill in Washington DC, to celebrate the tenth Anniversary of AGOA. In his remarks at the gathering, United States Trade Representative Ron Kirk credited AGOA with "a substantial increase in two-way U.S.-Africa trade since 2000, with African countries now exporting to the United States a more diverse range of value-added products," Kirk also asserted that the trade program "powerfully demonstrates the link between trade and economic development." [4] In this paper we will provide some evidence that supports Kirk's positive verdict: AGOA has stimulated exports of value-added products, especially clothing, but we will also suggest that the ultimate impact on economic development has been quite disappointing. We will argue that both the success and limitations are the predictable consequences of the manner in which the preferences have been constructed. We will show that although these preferences encourage exports, they simultaneously create disincentives for local value-addition that may limit the program's development benefits.

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[2] Bennet (2006)

[3] Several studies have been devoted to explaining this poor performance, and most conclude that the problems lie with the African countries themselves, rather than on the access given their products in foreign markets. A host of inhibiting factors have been identified. (Yeats et al., 1996) Wang and Winters (1998) These include poor governance (corruption, unstable political systems), poor regulatory environments, bad infrastructure, inadequate skills and entrepreneurial talent) and "aid for trade" has been focused of efforts to remedy these deficiencies.

[4] http://www.america.gov/st/business-english/2010/May/20100513122443SztiwomoD0.8958856.html

As embodied in the slogan "trade not aid" the idea that trade concessions can make an important contribution to development is not new. Indeed, it is part of the multilateral trade rules. In 1979 as a result of the Tokyo Round, an "enabling clause" was introduced into the GATT. This provision allowed developed countries to deviate from the core principle of MFN and provide non-reciprocal preferences to exports originating from developing countries under the Generalized System of Preferences (GSP).

If anything, the emphasis on trade as a driver of development has increased over time: Development needs were explicitly mentioned in the preamble of the Agreement to establish the WTO adopted in Marakesh in 1995 and are reflected the name of the most recent multilateral Round of negotiations, which have been dubbed the Doha Development Agenda. [5]

As indicated by Mr. Kirk's remarks, trade preferences are of interest not only because they might provide one time benefits in the form of higher incomes and increased employment but also because trade is associated with more dynamic benefits that lead to faster growth. Economic growth is an ever- expanding process in which actors not only replicate what they were doing on greater scale but continuously obtain develop new capabilities that allow them to produce increasingly sophisticated goods and services. More developed countries typically produce higher unit value products and wider ranges of products than their less-developed counterparts.[6] These products often face less elastic demands and provide higher profit margins than more standardized, commodity-like products. [7] If they can "learn by doing" by using trade preferences, it is hoped that firms that start by exporting a few simple products can upgrade their product sophistication, and diversify into other products and markets and ultimately become competitors that no longer need preferential treatment. [8] In addition, it is hoped that there are benefits to the rest of

[5] "*Recognizing* further that there is a need for positive efforts designed to ensure that developing countries, and especially the least developed among them, secure a share in the growth of international trade commensurate with the needs of their economic development,.." Agreement Establishing the World Trade Organization

[6] Cite Hausmann

[7] Cite Schott.

[8] According to Hwang (forthcoming) there is unconditional convergence at the 6-digit level. If countries start to produce low unit-value goods within a product category, they will eventually experience significant increases in their unit values. The claim is that this will happen more or less automatically, without any special supportive policies in place.

the economy. Other domestic firms could gain too through backward and forward linkages as exporters demand inputs and services and become increasingly embedded in the local economy. Initially, again they would supply relatively unsophisticated inputs such as cheap fabrics, but over time suppliers too would be able to upgrade. Additional benefits could be reaped if export opportunities attract foreign investment since foreign firms are a potentially attractive conduit for transferring technology and linkages to international suppliers and markets. Human and social capital can also be enhanced. If workers acquire new skills and knowledge, they can apply these either in becoming more productive in their jobs or by changing jobs, diffuse this knowledge to other parts of the economy. If managers gain experience and contacts, they can make their firms more profitable or eventually start firms of their own. Governments can learn too. By having to provide necessary public goods to exploit the preferences (infrastructure, regulations, government-business cooperation, training) they can develop programs and approaches that have wider application. This kind of dynamic has indeed occurred in many countries in response to export led growth. Dating back to the industrial revolution, textiles in particular have been an important driver of industrialization. Japan, and later Korea, Hong Kong and other dynamic Asians all cut their teeth as exporters as exporters of clothing continuously upgrading, and diversifying (See Gerefi 1999).[9]

Motivated in part by such considerations, the EU and the US both implemented multilateral Generalized Special Preferences (GSP) programs in the 1970s. In addition, they both have regionally focused preferential programs. The EU granted African, Caribbean and Pacific (ACP) Countries special preferences, first under the Lome Conventions (starting in1976) and later through the Contonou Agreement (2000). More recently the EU has concluded Economic Partnership Agreements (EPAs) with groups of ACP countries. The US has granted special preferences under the Caribbean Basin Initiative (CBI), the Andean Promotion Act and AGOA. Preferences for least developed countries (LDCSs) have received special attention. In 2001, the European Union introduced an "Everything But Arms" (EBA) program which provides LDC exports duty free, quota-free access. In the Doha Round negotiations the United States agreed to give duty-free access to LDCSs in 97 percent of its tariff lines.

[9] See Gerefi (1999) for an analysis of the upgrading process in Asia.

Yet, the notion that developed country markets are open to manufactured exports from least developed economies as a result of these concessions can be challenged. It is difficult for underdeveloped countries to produce complete complex products but they are often quite capable of providing simple assembly operations. Some of the preferences given through programs such as EBA are thus a sham because they include rules of origin that require more local production than these poor countries can provide. These rules are generally justified as necessary to prevent the trade-deflection that could occur if products are imported from third countries and then, with little additional value added, claimed as originating from preference-recipients – a practice sometimes known as "screwdriver plants." This is a legitimate concern, but the rules are more constraining than strictly necessary and they inhibit poor countries from specializing in the narrow slices of global production chains in which their comparative advantage is likely to lie. In the case of preference programs in apparel, these rules are particularly stringent, generally requiring that at least two (in the case of the EU) or even (in the case of the US) three transformation processes (e.g. yarn, fabric, assembly) in the preference-receiving or granting countries to qualify for duty-free entry. (For an excellent account see Ahmad, 2007). These rules are especially problematic because fabric production is a highly capital and technology activity that is beyond the capabilities of most very poor countries.

The rules of the US AGOA program are however an important exception, indeed perhaps the exception that proves the rule. AGOA not only gave all Sub-Saharan countries extensive duty -free quota-free access to the US (Table 1). [10] Its rules of origin also contained an unusual a waiver for wearing apparel that was granted to "Lesser Developed Beneficiary Countries" (LDBCs). Subject to a fairly generous market-share caps that have not been binding, the waiver allowed these LDBC countries to use third-country fabrics or yarn and still export clothing under the AGOA preferences.[11] Instead of requiring individual items to meet specific

[10] In May 2000, the US congress passed AGOA. The Act granted duty free access for 4600 GSP tariff-line items plus another 1800 tariff line –items not on the original GSP. This meant that, aside from some apparel and agricultural products, AGOA beneficiaries could export almost any product to the US duty free. The AGOA preferences for garments required that that they are made of 85% US made yarn and fabric or from fabrics and yarns made in other AGOA beneficiary countries.

[11]Most of the countries that were eligible for the wainver are classified as Least Developed by the United Nations. Botswana and Namibia did not meet the requirements for the Special Rule as their GDP per capita exceed the minimum of US1 500 in 1998. However, they were designated as LDC countries under amendments to the AGOA act in 2002 (AGOA II) and 2004 (AGOA IV). Mauritius was temporarily granted the third-country fabric derogation from October 2004-September 2005 under

transformation rules, such as minimum value-added requirements, or the use of domestic fabric, the US set up a simple inspection program that verified that genuine production activities were taking place. Once countries passed inspection, and satisfied some other criteria relating to good governance, almost all their exports to the US were eligible for the preference.[12] Although the special LDBC rule was originally scheduled to expire after three years, it was extended in 2004 for another three years and in 2007 for a further five.

Table 1: Summary of Apparel Rules of Origin under AGOA

Description of the rules of origin requirements	**Conditions of Access**
1. Apparel made from U.S. yarns or fabric	Unrestricted
2. Apparel assembled from regional fabric from U.S. or African yarn	Subject to tariff rate quota cap (currently 6.43675 percent to 2015)
3. Apparel assembled in a Lesser Developed Country using foreign fabric or yarn	Unrestricted for four years, but extended to 2012 (cap of 3.5 percent of US imports)
4. Certain cashmere and merino wool sweaters;	Unrestricted for selected products
5. Apparel made of yarns and fabrics not produced in commercial quantities in the US	Unrestricted
6. Eligible handloomed, handmade, or folklore articles and ethnic printed fabrics; and	Unrestricted for selected products from Dec 2006 under AGOA IV

Note: Unrestricted implies duty-free and quota-free treatment.

Countries not defined as "lesser-developed" such as South Africa and Mauritius did receive AGOA preferences, but they were required to meet GSP rules of origin that for clothing required the use of US or regional yarns or fabric. Because the different treatment for higher income countries provides a useful control group, AGOA provides an ideal opportunity to explore the role of different types of rules of origin in preferential arrangements. And the experience demonstrates how important they can be: US imports of clothing from AGOA countries (SITC 84- Apparel and Clothing Accessories) increased from $730 million in 2000 to $1755 million in 2004. This growth was dominated by US imports of clothing from the least developed

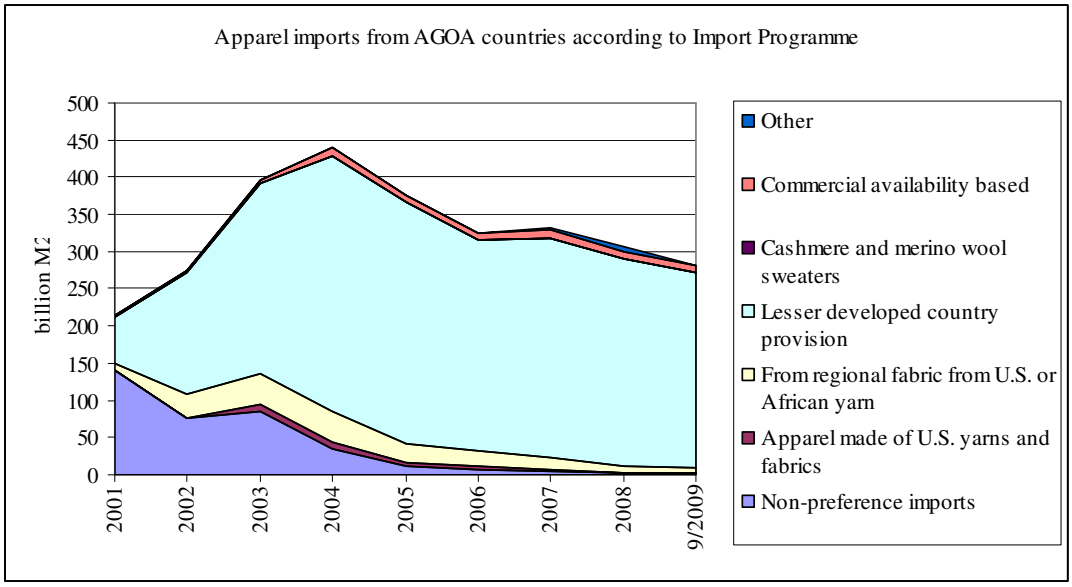
the Miscellaneous Tariff Bill of 2004 (known as AGOA III). More recently Mauritius qualified for the third-country fabric derogation in November 2008 for a period of 4 years.

[12] AGOA privileges also require protecting US intellectual property rights, observing labor rights, proving access to US trade and investment and implementing rule of law. Apparel exports require adopting an effective visa system to prevent transshipment

African countries which increased by four hundred percent, almost all of which took advantage of the lesser developed country provision (See Figure 1). The largest growth in exports between 2000 and 2004 came from Lesotho (up from $140 million to $456 million) and over the same period very significant increases also occurred in Kenya (up from $43 million to $270 million), Madagascar ($110 million to $323 million), Swaziland ($32 million to $179 million) and Namibia (0 to $79 million) (Figure 2). By contrast in 2004, US imports of clothing from South Africa and Mauritius, the two largest African clothing exporters when AGOA was passed, were actually 18 million dollars lower than they had been in 2000.

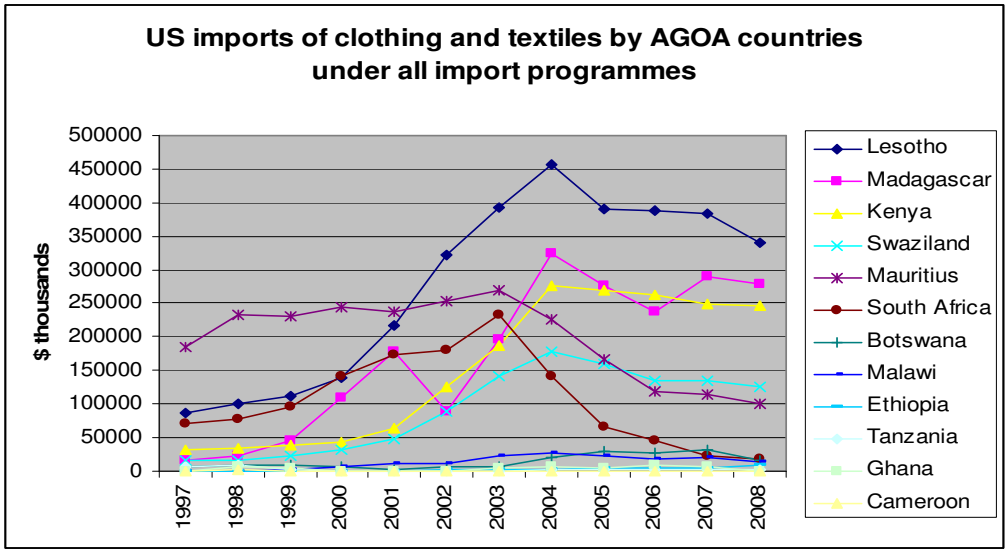
AGOA countries have experienced setbacks, however, first when the constraints on their (mainly Asian) competitors were lifted with the expiration of the Multi-Fiber Arrangement in 2005 and second with the slump in the US because of the global financial crisis. Nonetheless, despite these setbacks, overall US clothing imports under AGOA were $1,151 million in 2008 with imports of clothing from the least developed AGOA countries -- still three times as large as in 2000.[13] By contrast, despite AGOA, imports from South Africa and Mauritius combined were decimated and in 2008 were only a third of their 2000 levels.

Figure 1: US apparel imports from AGOA countries according to import program



[13] In July 2007 Lesotho Clothing and Applied Workers Union estimated employment at 44,000 compared to 55,000 in 2004.

Figure 2: US imports from AGOA countries



Did AGOA stimulate entry into new clothing markets? Table 2 reports the number of HTS ten-digit apparel products produced by AGOA countries. Overall AGOA countries export limited ranges of apparel products. South Africa, Mauritius and Madagascar had the widest range of products (over 130 each) prior to the implementation of AGOA in 2000. AGOA preferences increased product penetration. Many countries experienced exceptional increases in the total number of lines from 2000 to 2004 (see Kenya from 45 to 155, Swaziland from 47 to 139, Lesotho from 60 to 118). [14] In most countries however these trends reversed after 2005.

[14] The largest contractions in Lesotho occurred in firms producing knitted garments; those producing woven garments (e.g. denim) did better. See Bennet op. cit.

Table 2: Products traded (out of approx 1,500 possible products), sorted by 2004

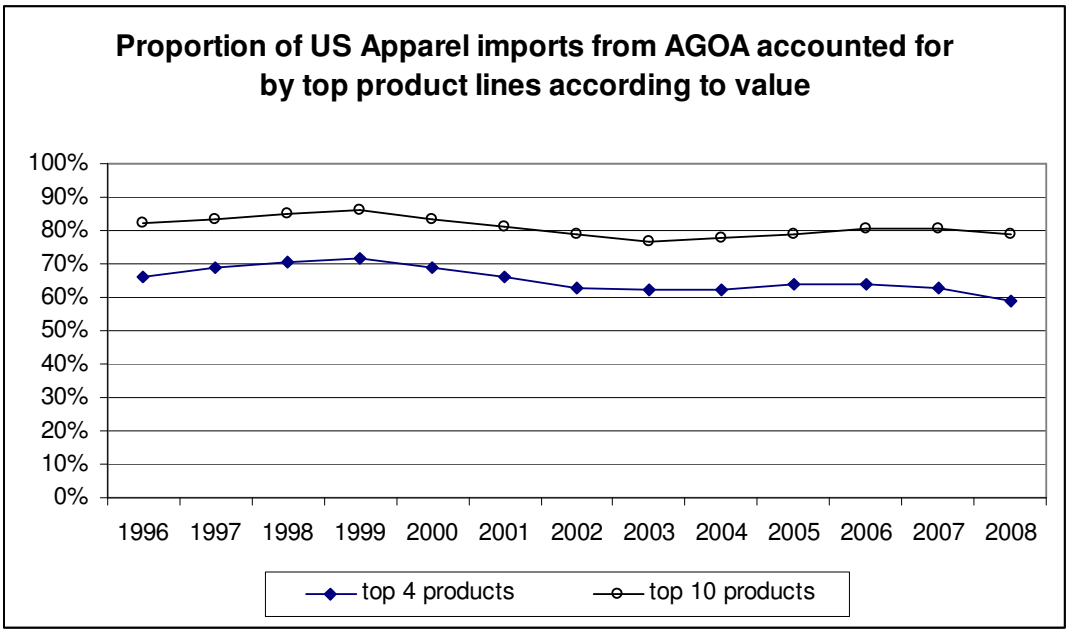
Eligibility	Country	1996	2000	2004	2008
Apparel eligible	Mauritius	165	139	135	139
	South Africa	136	267	318	177
Apparel eligible, LDC special rule	Benin	2	2	4	0
	Botswana	14	24	57	18
	Burkina	8	9	9	4
	Cameroon	10	7	14	18
	Cape Verde	2	4	14	5
	Chad	0	0	1	0
	Ethiopia	9	4	41	79
	Ghana	38	52	63	48
	Kenya	55	45	155	117
	Lesotho	41	60	118	84
	Madagascar	38	175	236	259
	Malawi	2	22	45	25
	Mali	10	10	12	11
	Mozambique	3	0	7	0
	Namibia	0	1	40	2
	Niger	4	4	7	5
	Nigeria	61	47	39	33
	Rwanda	0	0	2	5
	Senegal	31	20	10	16
	Sierra Leone	2	28	45	54
	Swaziland	21	47	139	86
	Tanzania	4	6	24	16
	Uganda	0	0	9	4
	Zambia	1	1	4	4
non-apparel eligible	Angola	0	0	0	0
	Burundi	1	1	0	0
	Comoros	1	0	1	0
	Congo (Brazzaville)	0	0	3	0
	Congo (Kinshasa)	3	4	1	3
	Djibouti	0	0	0	0
	Gabon	1	1	3	0
	Gambia	6	11	7	9
	Guinea	5	12	13	12
	Guinea-Bissau	0	0	0	3
	Liberia	2	3	2	3
	Sao Tome and Principe	1	1	0	0
	Seychelles	0	2	3	6
	Togo	13	4	3	4
	All AGOA countries	323	439	537	465
Possible products		1,548	1,533	1,525	1,515

Several research papers have confirmed what is obvious to the naked eye -- that the lesser developed country provisions have played a key role in the outcomes. Using a variety of methodologies, empirical estimates confirm that preferences under AGOA are a significant determinant of Apparel exports: Mattoo, Devesh, and Subramanian (2003) stressed the role of rules of origin in limiting the overall benefits from AGOA to all recipients. Collier & Venables (2007) find that the AGOA apparel provision had a positive and significant effect. Frazer and Van Biesebroeck (2007) find that the AGOA had a "large and robust effect that grew over time" and estimate that overall AGOA apparel exports increased by 53 percent with stronger impacts on products with high initial levels of protection. Portugal-Perez (2008) report an impact

of 96 percent for 22 countries eligible for the third-country fabric provision, and 303 percent for the top 7 beneficiaries [15] In addition to higher export volumes there is also evidence that AGOA exporters enjoyed higher prices and captured some of the tariff rents created by the preferences (Olarreaga and Ozden 2005). Apparently, whatever Africa's handicaps, they have not prevented substantial responses: indeed, there is no evidence of differential effects in taking advantage of AGOA based on measures of corruption or institutional quality (Frazer and Van Biesebroeck 2007).

Despite the impressive growth in volumes, there is also some disquieting evidence in AGOA's performance that relates to the issue of dynamic benefits. Decompositions of output growth reported in Table 3 reveal that the export of new product lines (the extensive margin) contributed only 30 percent of total AGOA import growth from LDC special rule countries between 2000 and 2004, and 42 percent of the decline from 2004-08. *Strikingly only 8 percent of the growth in Lesotho's apparel exports took the form of new products*. There has been little or no upgrading in products over time. The share of product lines accounted for by the top four and top ten products is around sixty and eighty percent and has remained fairly constant throughout the period (See Figure 3).

Figure 3: Concentration indicators of US apparel imports from AGOA beneficiaries



[15] Other studies include Brenton and Ikezuki (2005), Gibbon, Seyoum Nouve (2005), Rolfe and Woodward (2005).

Notes: Based on US import data at the HS 10-digit level.

Table 3: Decomposition of growth in US apparel imports: Extensive and Intensive growth

		Contribution Intensive growth	Contribution Extensive growth	Average annual Growth (US$)	Contribution Intensive growth	Contribution Extensive growth	Average annual Growth (US$)	Cumulative imports 2004
		2000-04			**2004-08**			
Apparel eligible, LDC special rule	Benin	0.00	1.00	0.33	0.00	1.00	-1.00	0.00
	Botswana	0.24	0.76	0.27	-1.56	2.56	-0.06	0.01
	Burkina Faso	-0.02	1.02	0.28	0.00	1.00	-0.49	0.01
	Cameroon	0.00	1.00	0.22	-0.27	1.27	0.21	0.01
	Cape Verde	0.33	0.67	0.36	0.00	1.00	-0.73	0.01
	Chad	0.00	1.00		0.00	1.00	-1.00	0.01
	Ethiopia	0.00	1.00	4.00	0.52	0.48	0.30	0.02
	Ghana	0.02	0.98	1.18	0.95	0.05	-0.41	0.02
	Kenya	0.68	0.32	0.59	0.81	0.19	-0.03	0.18
	Lesotho	0.92	0.08	0.34	0.87	0.13	-0.07	0.44
	Madagascar	0.78	0.22	0.31	0.91	0.09	-0.04	0.62
	Malawi	0.51	0.49	0.38	0.32	0.68	-0.17	0.64
	Mali	1.19	-0.19	-0.17	0.90	0.10	0.37	0.64
	Mozambique	0.00	1.00		0.00	1.00	-1.00	0.64
	Namibia	0.00	1.00	3.69	0.07	0.93	-0.94	0.68
	Niger	-0.82	1.82	0.11	0.44	0.56	0.18	0.68
	Nigeria	1.90	-0.90	-0.07	-0.10	1.10	-0.08	0.68
	Rwanda	0.00	1.00		0.00	1.00	0.92	0.68
	Senegal	0.73	0.27	-0.30	0.65	0.35	0.16	0.68
	Sierra Leone	0.40	0.60	0.59	0.19	0.81	-0.39	0.68
	Swaziland	0.57	0.43	0.54	0.63	0.37	-0.09	0.79
	Tanzania	0.24	0.76	1.80	-0.25	1.25	-0.12	0.79
	Uganda	0.00	1.00		-0.04	1.04	-0.44	0.79
	Zambia	0.00	1.00	-0.42	0.00	1.00	-0.52	0.79
Apparel eligible	Mauritius	0.67	0.33	-0.02	0.94	0.06	-0.18	0.92
	South Africa	-17.67	18.67	0.00	0.80	0.20	-0.40	1.00
non-apparel eligible	Burundi	0.00	1.00	-1.00				1.00
	Comoros	0.00	1.00		0.00	1.00	-1.00	1.00
	Congo (DROC)	0.00	1.00	-0.19	0.00	1.00	1.45	1.00
	Congo (ROC)	0.00	1.00		0.00	1.00	-1.00	1.00
	Gabon	0.00	1.00	2.56	0.00	1.00	-1.00	1.00
	Gambia	-0.32	1.32	-0.14	0.90	0.10	0.32	1.00
	Guinea	-0.02	1.02	-0.42	1.01	-0.01	0.11	1.00
	Guinea-Bissau				0.00	1.00		1.00
	Liberia	0.00	1.00	-0.34	0.00	1.00	0.12	1.00
	Sao Tome & Principe	0.00	1.00	-1.00				1.00
	Seychelles	0.95	0.05	-0.64	0.00	1.00	0.97	1.00
	Togo	0.00	1.00	-0.18	0.00	1.00	0.47	1.00
All AGOA		0.68	0.32	0.25	0.70	0.30	-0.10	
LDC special rule eligible		0.69	0.31	0.42	0.58	0.42	-0.07	
Other apparel eligible		1.05	-0.05	-0.01	0.87	0.13	-0.25	
Other AGOA		-2.03	3.03	0.04	-0.18	1.18	-0.21	

Note: Mauritius is treated as not eligible to export under LDC special rule, despite being granted temporary LDC status from October 2004-September 2005 under the Miscellaneous Tariff Bill of 2004 (known as AGOA III).

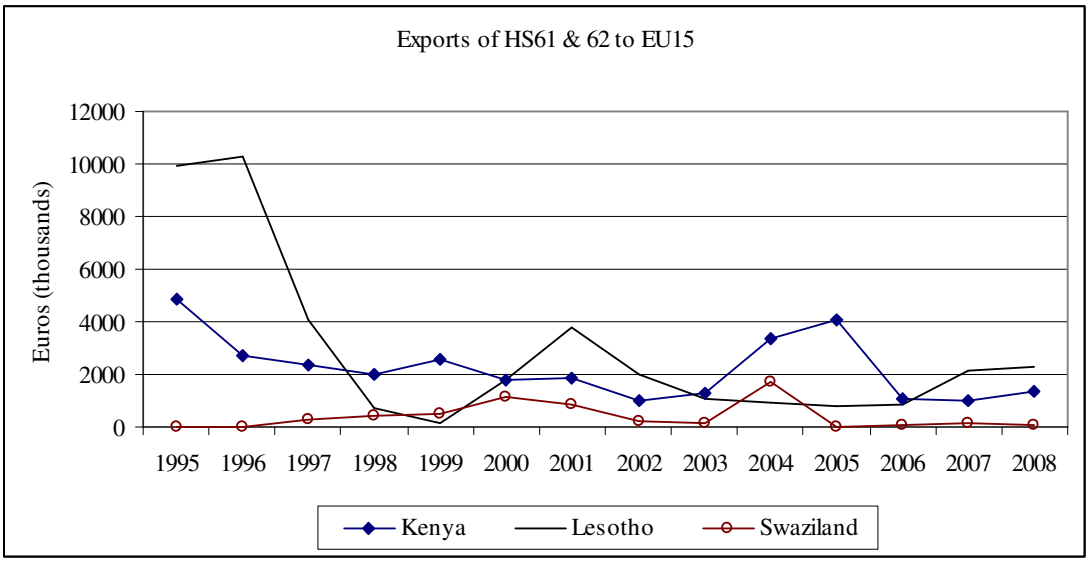
Lesotho

As the largest apparel exporter to the US, Lesotho is of particular interest. Whereas some countries such as Namibia, Malawi and Botswana, became clothing exporters for the first time, the response of Lesotho actually built on a longer historical experience in which trade preferences and policies also played an important

part. The industry was launched in the 1980s when Taiwanese manufacturers, originally based in South Africa, moved to Lesotho in order to avoid trade sanctions imposed by the US and Europe on what was then the Apartheid regime. More investors were attracted in the late 1980s, after the European Union signed the Lome' convention, which granted special preferences to the ACP countries that had formerly been colonies. While the clothing preferences in Lome had a double transformation rule, Lesotho was granted a temporary derogation from the requirement allowed it to use third country fabrics that the investors took advantage of.

When the derogation expired in the mid 90s, exports to Europe plunged and they have never recovered. (Figure 4). This experience provided the first demonstration of the importance of the role of these special preferences in the viability of Lesotho's exports of clothing. Clothing exports to the United States were subject to tariffs but were also constrained by quota restrictions under the MFA. As these became increasingly binding on others, Lesotho's foreign owned firms therefore shifted to exporting to the United States to take advantage of its unfilled quotas. Lesotho's concentration of exports in products where quota constraints on Chinese exports were binding is clearly revealed in Figure 5. Thus even prior to the passage of AGOA, firms based in Lesotho, most of which were subsidiaries of Asian multinationals were exporting to the US. Indeed, after 1999, 99 percent of all Lesotho's apparel exports went to the US with only 0.8% going to South Africa and just 0.2% to the EU.

Figure 4: Apparel exports to the EU 15, selected AGOA countries



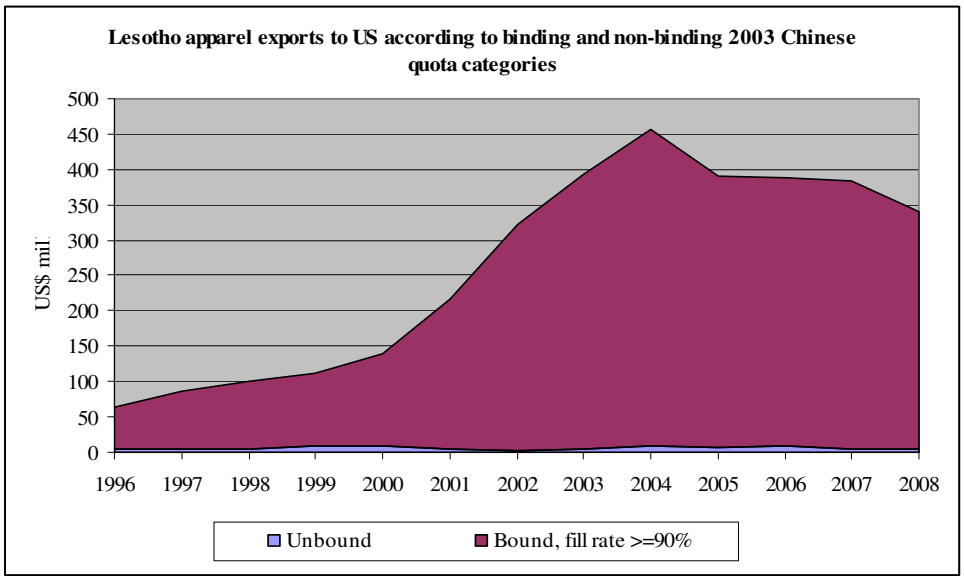
Notes: Own calculations using data from Eurostat (http://epp.eurostat.ec.europa.eu/newxtweb)

The small share of Lesotho's exports going to South Africa is also indicates the important role played by fabric rules of origin. The US MFN tariff on clothing is around 17 percent, while the SACU tariff is about 40 percent. Thus garments exported to South Africa from Lesotho (which is within the customs union) have a much larger margin of preference. Yet Lesotho is far more competitive in the US but not in SACU.[16] The reason is that to sell in South Africa, Lesotho has to pay SACU tariffs or SACU prices for fabric. By contrast, under AGOA it obtains these duty free.[17]

[16] Indeed according to Sandrey et al. (2005) Lesotho cannot even compete in Lesotho! "Examination of the local clothing retail outlets reveals a predominance of both Chinese and South African garments."

[17] To be sure, factors besides favourable rules of origin have contributed to Lesotho's performance. These include fluctuations in the Rand to which its currency is tied (favourable between 2000 and 2002) and other policies to assist exporters by the Lesotho Government. In addition Lesotho has benefited from a favourable international image as a non-sweatshop producer. (Seidman 2009) It has also been promoted by Bono in his campaign against Aids. The Lesotho National Development Corporation (LNDC) has played an active role, offering favourable rents for factory shells. The government also provided generous tax treatment from the Government --reduced from 15 to 0 in 2006 – and sought to maintain industrial peace with a Directorate of Dispute Prevention and Resolution. The Government has used the Duty-Credit-Certificate Scheme of the South African Customs Union that gives apparel firms between 10 and 25 percent of the FOB value of their exports in certificates which allow them to import textiles or apparel duty-free.

Figure 5: Lesotho apparel exports to US according to Chinese quota fill rates



Notes: Quota fill rates are obtained from OTEXA ((http://otexa.ita.doc.gov/). Quotas on product lines are assumed binding if the fill rate is greater than or equal to 90%.

AGOA has been in effect for a decade but there is little evidence that much of Lesotho's industry could survive without preferences or that it has diversified horizontally into new products and markets or vertically into greater domestic value addition. Factories in Lesotho continue to concentrate on just a narrow range of garments: the most basic low unit value categories knitted tee-shorts, slacks, blouses and blue-jeans. The slice of the production chain they participate in is narrow and does not seem to be expanding. Most apparel manufacturing in Lesotho is CMT (Cut-Make-Trim). The firms, all foreign owned, typically provide assembly, packaging and shipping services and depend on their Asian headquarters to generate orders, design the clothes and send them the fabric they need. This can be seen by comparing the industry wage bill for 50,000 workers (approximately $1000 per worker) i.e. $50 million in 2004 with total US exports valued at $456 million. Most of the value is thus added to other parts of the chain. Almost none of the managers are locals and the buyers of fabric and the marketers of the garments and the key strategic corporate decisions are all made thousands of miles away in Asia.

The local production process is characterized by highly routine steps used to produce very large volumes. Just one buyer -- the US retailer the GAP -- accounts for almost 40 percent of overall output. The combination of the large scale on which they

operate and the large orders by concentrated buyers, makes it difficult for small firms to enter the market. In addition, to move up the value chain and to produce differentiated products in smaller batches requires more skilled workers. This is part of the explanation for Lesotho's inability to do well in the relatively small South African market in which demand is more varied.

One firm in Lesotho has built a denim plant – but it is an exception.[18] With this exception, all fabrics are imported. Lesotho and other AGOA countries, even South Africa, therefore, lack the domestic textile industry that would allow them to meet the regular clothing rules of origin in US preference programs.

Lesotho's workers have relatively low productivity levels and their skills do not appear to have increased over time. Lall (2005) estimated that while Lesotho's wages were similar to Asian levels, its productivity was typically only fifty percent of East Asian levels. According to Morris and Sedowski (2006), worker productivity has not increased over a ten year period. Lall ascribes the lack of improvement in part to the Labor Code Rule that prohibits the use of piece rate. He noted "Despite a decade and a half or experience in CMT operations, productivity in Lesotho is below that of major competitors. Since wages are comparable, its competitiveness cannot outlast trade privileges" (Lall 2005).

The relatively low quality of Lesotho's (and other AGOA) apparel exports is also revealed in the comparative price of its exports. Table 4 presents the average unit values of the top 15 apparel products at HS 10-digit level exported by Lesotho to the US in 2004. These unit values are compared against the average unit value of other lesser-developed AGOA countries and the 10^{th}, 25^{th}, median, 75^{th} and 90^{th} percentile unit values of the 226 countries in the sample. In all but one case when it just below the 25^{th} percentile, the unit values of Lesotho's apparel exports fall between the 25^{th} and 50^{th} percentile range.

[18] In 2004 the industry faced a major challenge which the potential expiration of the special rule. Partly anticipating the expiration of the Special Rule in 2004, the Nien Hsing Group of Taiwan invested over $100 million to build the Formosa Mill, a state of the art denim fabric mill.

Table 4: Price (US$ per dozen) of top 15 Lesotho products in terms of export value, ranked largest to smallest, 2004

HS	Description	Lesotho	Other lesser-developed AGOA	Percentiles 10th	25th	Median	75th	90th	Cumulative trade share Lesotho
6110202075	WOMEN'S/GIRL'S OTHER PULLOVERS OF COTTON	31	27	26	32	46	99	280	14%
6110202065	MEN'S/BOYS' OTHER PULLOVERS OF COTTON	36	36	24	34	60	110	222	26%
6203424010	MENS TROUSER BREECHES COTTON BLUE DENIM	90	73	48	63	100	191	465	32%
6203424035	BOYS TROUSER/BREECHES, COTTON, BLUE DENIM.	68	66	42	54	68	98	269	37%
6204624010	WOMENS TROUSERS/BREECHES, COTTON, BLUE DENIM.	87	71	52	76	92	199	449	42%
6204624020	WOMENS TROUSERS/BREECHES OTHER COTTON, NOT KNIT	71	58	39	65	93	232	384	45%
6110303055	WOMEN'S/GIRL'S OTHER SWEATERS, MANMADE FIBERS	36	46	34	43	57	120	406	49%
6204624040	GIRLS TROUSER COT BLUE DNM NT IMP PLYSUIT PT,N KT	70	66	43	59	73	100	470	52%
6110303050	MEN'S/BOYS'OTHER SWEATERS, MANMADE FIBERS, KNIT	35	52	30	41	68	163	287	56%
6110202040	MEN'S/BOYS' SWEATSHIRTS, OF COTTON	60	56	41	60	77	170	306	58%
6104632011	WOMEN'S TROUSERS AND BREECHES, SYNTHETIC FIBERS	50	46	28	43	60	198	409	61%
6203424045	BOYS TROUSER ETC OT COTTON	70	49	26	47	67	93	243	63%
6203424060	BOYS SHORTS COTTON NOT PLAYSUIT PARTS, NOT KNIT	52	53	25	39	55	84	207	65%
6203424050	MENS SHORTS OF COTTON	69	53	27	48	74	148	288	67%
6204624055	WOMENS SHORTS OF COTTON	63	49	34	52	67	113	337	69%
	All products exported by Lesotho	37	59	22	33	60	122	299	

Notes: The mean price for Other AGOA is the exponent of the mean log price.

What is also striking is the range of unit values even within these highly disaggregated product lines (see Schott 2004). For example, the 90th percentile unit value of a dozen women's or girls' cotton pullovers (Lesotho's top apparel export) in 2004 was 280 dollars versus 31 dollars for Lesotho exports.

The combination of a productivity disadvantage and almost no domestic textile industry makes the industry's survival totally dependent on its preferences. Each time the expiration of the special rule has drawn near, therefore studies have issued credible and dire warnings about the industry's ability to survive without them. [19]

[19] Provide cites

Lesotho's competitiveness in the US market has not translated into increased garment exports to other markets such as the EU or South Africa.[20] Lesotho's other merchandise exports are minimal. Competitiveness in garments has also not translated into competitiveness in other labor-intensive manufactured products.

This experience makes it clear that trade need not automatically lead to growth and the manner in which trade is stimulated could well prove consequential for the amount and nature of the growth it stimulates. In particular it suggests that trade that is stimulated by preferences might well have different effects than trade that occurs for other reasons.

Why this disappointment? Both Lall (2005) and Collier and Venables (2007) suggest it may be that these AGOA countries are simply too underdeveloped for the exports to ignite the process. Collier and Venables argue it reflects a lack of complementary inputs that are required to exploit scale economies. They suggest that preferences are only likely to work if countries already have "the skills and infrastructure to be near the threshold of global manufacturing competitiveness" (P1328). Lall also suggests that part of the explanation could lie with having foreign factory owners – most of whom are Taiwanese, -- that are not closely integrated into the local community. Ironically, this might suggest that these kinds of preferences should be given to the more advanced developing countries like South Africa rather than the least developed countries that have received them.

In this paper, however, we will explore a different explanation that has been overlooked in the literature. We will argue that both the positive and negative responses to AGOA are no accident. Indeed, they are the consequences that economic theory would lead us to expect, given the form in which the preferences have been granted.

As we will show using the theory of effective protection, that preferences combined with the third country fabric rule can have powerful financial effects. They could easily be the equivalent of subsidy to production that is two or three times higher than the 17 percent preference margin granted by AGOA through MFN tariff relief on clothing. This allows AGOA producers to offset cost disadvantages due to

[20] On the positive side, there is also no evidence the exports to the US were at the expense of those to Europe either -- Frazer and Van Biesebroeck (2007). In addition, linkages to the rest of the economy have been minimal.

the lower productivity of their workers and greater distance from suppliers and markets and helps explain why the initial responses to AGOA were so powerful. On the other hand, in theory the preferences also have two deleterious effects. First, they steer firms toward producing only the simplest products in which clothing producers add little value. Thus the preferences tax skills acquisition and discourage firms from moving up the value-chain. Second, the preferences (and the MFA) discourage backward linkages because they induce exporters to use relatively expensive fabrics rather than the cheaper fabrics that are more likely to be produced in poor countries.

In sum, trade preferences "work." They can stimulate trade, raise incomes in developing countries and boost employment. But whether they actually lead to development conceived of as a cumulative growth process is much less certain. Although implemented with the best intentions, these programs may have created incentives that could actually make such development less likely.

In addition changes in global trade policy at first helped and then hindered AGOA's performance. On the one hand, the MFA initially provided an especially favorable environment for AGOA countries to produce low unit value products because it not only constrained their Asian competitors but also induced these exporters to shift towards higher quality products. On the other hand, given the part of the market they were occupying, the removal of the MFA had a disproportionate impact on AGOA recipients because Asian firms responded by reducing their average quality.

This paper proceeds now in three sections. In the first we discuss the economic theory of the effects these regimes are likely to have. In the second, we conduct several empirical tests of the theory and in the final section we present our conclusions and policy implications.

Theory

The overview of Lesotho's export performance identified the influence of two trade policies: (i) the effect of MFA quotas and their removal and (ii) the effect of tariff preferences and rules of origin. In this section we draw on economic theory to explore the relationship between these policies and exports of clothing. The focus is on incentives they create for the production and export of particular types of clothing products. We are particularly interested in the impact on product characteristics such as quality as well as value addition in beneficiary countries.

We will show that the regime governing clothing trade can be expected to have a profound impact on clothing production choices in countries like Lesotho. In particular, we will demonstrate that the MFA not only provided a subsidy to Lesotho's clothing exports but also created incentives for it to specialize in low quality and low valued-added products that contained large amounts of fabric. Since the MFA had created incentives for more competitive producers such as China to upgrade their product quality, the removal of the quotas were particularly problematic for Lesotho.

We will also show that while the AGOA program provided additional incentives for expanded exports from less developed African countries it added two additional effects. It provided even more powerful incentives to expand the most low-quality clothing assembly, while at the same time encouraging additional use of more expensive fabrics. All told, until the MFA was removed, while the preferences did encouraged more clothing production in AGOA countries, therefore, they also encouraged the use of relatively expensive fabric in which these countries were most unlikely to have a comparative advantage.

Some the arguments we will use are not new. The body of literature on how trade policies influence product characteristics is well established in the case of quotas (Falvey, 1979; Krishna, 1987, Feenstra, 1988) and transport costs (Alchian and Allen, 1964; Hummels and Skiba, 2004). The central result in this literature is that quotas and unit transport costs lead to quality upgrading, while tariffs do not. However, the literature generally assumes integrated production, and less studied are the effects of

quotas and tariffs on the quality of products that contain imported intermediate inputs. The role of rules of origin in quality decisions not been widely explored. This analysis therefore explores how tariff preferences and their associated rules of origin lead to changes in the quality of goods produced and exported. We focus on clothing, although some of the results would be applicable to other products.

Model

We develop a simple model in which apparel products are differentiated by type of product (shirts, jeans, suits, etc.) and the quality and content of fabric. Clothing products $y(zj)$ are defined across two continuums, each over the interval [0,1]: z denotes different types of clothing *products* and j denotes *varieties* within these products that differ according to the quality and amount of fabric.

We specify a constant returns to scale Leontief technology production function whereby apparel ($y(zj)$) is assembled using labor and fabric as follows:[21]

$$y(zj) = \min\left[L/a(z), F(zj)/\theta(zj)\right]$$

where $a(z)$ is the labor used per unit output, L is the quantity of labor, $F(zj)$ is the quantity of fabric and $\theta(zj)$ is unit fabric requirement in square meters (the input-output coefficient). To simplify the model, we have assumed that product types are differentiated according to unit labor requirements and variety j is differentiated according to fabric content. In reality, different skills may be required when assembling similar products (e.g. jeans) using different qualities of fabric.[22] In this case we would specify unit labor requirements over z and j, i.e. $a(zj)$.

Using the cost function dual to the production function, the unit cost $c(zj)$ of clothing (assuming no transport costs) is:

$$c(zj) = a(z)w + \theta(zj)PF(zj) \qquad (1)$$

[21] Portugal-Perez (2008) assumes a similar production function. A clear limitation of this model is that it does not take into account capital (sewing machines, fabric cutters, irons, washing and drying machines) used in the production of apparel. However, this may not be a major limitation as applied to apparel production. The apparel industry is frequently criticized for being footloose, moving from country to country following government incentives and low wages. In a world where this type of capital is internationally mobile, it is the non-traded factors that become the primary determinant of a country's comparative advantage (Wood and Mayer, 2001).

[22] Our interviews with firms in Lesotho indicated that relatively skilled or experienced labour is required when using more sophisticated or higher quality fabric.

where w is the wage and $PF(zj)$ is the price per square meter fabric. The cost of a unit of apparel is therefore comprised of unit labor costs and unit fabric costs. We assume firms are competitive, so the free on board price is given by

$$P(zj) = c(zj) = a(z)w + \theta(zj)PF(zj) \qquad (2)$$

This basic framework can be used to evaluate the effect of clothing quotas on the choice of product quality for exporting firms.

Quotas and choice of product quality for exporting firms

The MFA was important in the markets in which Lesotho and other clothing producers operated and its application and elimination had major effects. Quotas on clothing imports into developed economies were widely applied under the MFA with imports from China particularly constrained (Brambilla, Khandelwa and Schott, 2007). Their removal in January 2005 under the MFA was associated with dramatic changes in both the price and quality composition of exports by quota constrained countries such as China (Harrigan and Barrows, 2009). The binding constraint of quotas on Chinese and other competitive exporters of clothing facilitated a geographical dispersion of clothing production as producers re-located to countries where there were unused quotas. Lesotho (and other AGOA countries) was a beneficiary of this relocation of production as its US quotas were not filled.[23] But the effects on clothing products were not all the same. As we will argue, *quotas under the MFA induced the production of low value added, low quality and fabric-intensive clothing in developing countries such as Lesotho.*

It is well established in the literature that under competitive conditions a quota is equivalent to a specific tariff (Falvey, 1979). The result also holds in cases of imperfect competition Feenstra (1988, 2004).[24] While the quota restricts the total volume of sales, its effect differs across varieties produced by the firm. Firms adjust the exports of different varieties to ensure that they earn the same quota premium from each variety exported (Feenstra, 2004). The US import price of clothing

[23] For data on quota fill rates see the US Office for Textiles and Apparel (OTEXA) (http://otexa.ita.doc.gov/). Brambilla et al. (2007) provide a review of the fill rates for various countries since the 1980s.

[24] See Krishna (1987) for an imperfect competition model where firms jointly select the quantity and the quality of the products they export in response to a quota. Feenstra (1988, 2004) also show how quotas lead to an upgrading of the characteristics within each variety produced.

products from quota constrained countries (denoted by *) assuming no tariffs can thus be represented as

$$P^*(zj) = a^*(z)w + FC^*(zj) + s\,. \qquad (3)$$

where s stands for the shadow price of the quota and $FC^*(zj)$ denotes the unit fabric costs ($\theta^*(zj)PF^*(zj)$).

The implication is that relative to their free trade price, US import prices of $y^*(zj)$ increase by:

$$1 + s/\left(a^*(z)w + FC^*(zj)\right). \qquad (4)$$

Price increases are therefore inversely related to the free trade price, i.e. the proportional increase in price is greatest for low priced products. The consequence is that the quota raises the price of cheap (low quality) products that contain few labor services and cheap fabric content (i.e. low values of $a^*(z)w + FC^*(zj)$) relative to high quality expensive products. Under standard assumptions regarding the consumer utility function, the quota induces a shift in consumption towards the relatively high priced high quality product, in addition to reducing the overall quantity of exports (Falvey, 1979).[25]

For a small quota unconstrained exporters such as Lesotho, however, the incentives are in the opposite direction. Because of their size, these economies are too small to influence the world or US price of clothing products. They are therefore price takers in the international market. If Lesotho and Chinese products are perfect substitutes, then the US quota on Chinese clothing exports is equivalent to a specific subsidy s provided to clothing exporters in Lesotho (lack of * denotes Lesotho) as follows

$$P^*(zj) = P(zj) = a(z)w + FC(zj) - s \qquad (5)$$

While the specific subsidy raises the profitability of clothing production overall, the increase is proportionately larger in cheap low quality clothing products where value addition and fabric costs are low. Firms will adjust their production decisions and allocate fabric and labor services to different varieties of clothing products to ensure that they earn the same implicit subsidy s from each unit exported. Given the

[25] Falvey (1979) and Hummels and Skiba (2004), for example, assume a Hicksian compensated demand function to remove income effects and to isolate changes in relative quantities due to changes in relative prices.

assumption of constant returns to scale**, firms will become more specialized in the production of cheap low quality clothing products.**[26]

The same outcome arises even if we assume that Chinese and Lesotho clothing products are imperfect substitutes. Assume, for example, a constant elasticity of substitution function for US clothing import demand Q

$$Q(zj) = \left[\beta L(zj)^{(\sigma_{zj}-1)/\sigma_{zj}} + (1-\beta)C(zj)^{(\sigma_{zj}-1)/\sigma_{zj}}\right]^{\sigma_{zj}/(\sigma_{zj}-1)} \quad (6)$$

where σ_{zj} is the constant elasticity of substitution between clothing imports of variety combination (zj) from Lesotho (L) and China (C).[27] In optimizing consumption, the consumer chooses between clothing imports from Lesotho and China according to the first-order condition

$$\frac{L(zj)}{C(zj)} = \left[\frac{\beta}{(1-\beta)}\frac{P^*(zj)}{P(zj)}\right]^{\sigma_{zj}} \quad (7)$$

The effect of the quota on the relative demand for clothing from Lesotho is a function of both the change in the relative price and the elasticity of substitution.[28] As already discussed, the rise in price of Chinese imports relative to Lesotho's is greater for cheap low quality products. It can also reasonably be expected that the elasticity of substitution is also greater for low quality goods. High quality jeans, for example, are more likely to be associated with brand loyalty, status and designer attributes, all of which reduce their substitutability with alternative products from other countries.[29] **The relative price shift and the substitution elasticity complement each other in raising the relative demand by US consumers for low quality cheap clothing imports from Lesotho.**

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[26] Note that the model does not include transport costs. Lesotho and other AGOA countries are distant from the developed country markets where they sell their apparel and the Asian markets from where they purchase their fabric inputs. Imposing a fixed transport cost would lead to an Alchian and Allen (1964) effect where Lesotho clothing exporters upgrade the quality of fabric inputs and final apparel products. Lesotho would therefore not necessarily specialise in the cheapest low quality product available.

[27] This requires that utilities in the composite consumption function are weakly separable.

[28] In a fully specified demand relationship, the change in relative demand is also a function of the elasticity of substitution across high and low quality products in each country and across each country (See Bauman 2004). Income effects are ignored.

[29] Active marketing campaigns such as the "Red" campaign led by Bono from the music band U2 is an example of reducing the elasticity of substitution between Lesotho clothing exports and foreign alternatives. Similarly, Lesotho has signed a 'good labour practice' code in an attempt to raise the US consumer preference for their exports. This would be expected to reduce the substitutability of Lesotho clothing exports.

There are three additional considerations.[30] Firstly, the implicit specific subsidy of the quota enables non-quota constrained countries to export apparel products even if they do not have a comparative advantage in producing that product. The reason is that the implicit subsidy compensates the inefficient apparel producing countries for their relatively high unit labor costs ($a(z)w$). This helps explain why countries such as Lesotho exported apparel under the MFA despite relatively low productivity levels and wages comparable to those Asian levels (Lall 2005).

The second consideration is that the implicit subsidy results in a greater *effective* subsidy in products with low value addition or high fabric-intensity, assuming fabric is traded at world prices. Take for example, two apparel products each priced at US$ 10, but differing in terms of fabric-intensity: Fabric costs make up 90 percent of the cost of product A and 10 percent of the cost of product B. An implicit quota subsidy of 1 dollar raises the effective return (subsidy/initial value added) to product A by 100 percent, but only 11.1 percent for product B. So the total impact of the quota is a combination of relative price shifts (incentive for non-quota constrained countries to produce relatively cheaper apparel) and *effective* subsidy effects (where firms are induced to produce relatively fabric-intensive products for every given price level).

The third consideration is that US import quotas administered by the Office of Textiles and Apparels (OTEXA) are specified in terms of yardage of fabric equivalents and not quantity of goods. In this case, the quota is equivalent to a specific tariff on the price per square meter of fabric equivalence:

$$P^*(zj)/\theta(zj) = a^*(z)w/\theta(zj) + PF^*(zj) + v\,. \qquad (8)$$

and the proportionate change in the import price per *square meter of fabric* from free trade levels is given by

$$1 + \theta(zj)v/\left(a^*(z)w + FC^*(zj)\right). \qquad (9)$$

The proportionate change in the import price is therefore inversely related to the price of fabric used and unit labor costs and is positively related to the fabric input-output coefficient. The result is that the quota creates a relative incentive for Chinese

[30] There is a fourth consideration as well. Missing from this story is the fact that within-quota tariffs were also imposed under the MFA. As shown by Hummels and Skiba (2004), *ad valorem* tariffs lower the relative demand for high-quality goods in the presence of per unit transport costs (or equivalently quotas). As tariffs rise, the shadow price of the quota constraint falls and dampens the effect (but not direction) of the quota on relative demand for high-quality products.

exporters to produce clothing varieties that use many hours of labor services (high $a(z)$) and contain very little, but very expensive fabric (low $\theta(zj)$ and high $FP^*(zj)$). The percentage increase in the US import price will also be lowest for these products. *The flip side for Lesotho is that relative demand and relative prices shift in favor of exporting low quality clothing varieties that are intensive in the use of fabric and require very little labor services.*

$$P^*(zj)/\theta(zj) = a^*(z)w/\theta(zj) + PF^*(zj) + v\,. \qquad (8)$$

$$1 + \theta(zj)v/\left(a^*(z)w + FC^*(zj)\right)$$

Removing the MFA would have effects in the opposite direction. Previously constrained countries would shift towards products with lower labor value added and use more fabric that was cheaper. Unconstrained countries would thus be especially adversely affected in these products.

Tariff preferences and product quality

Let us turn to the effect of the tariff preferences granted under AGOA. Generally, theory suggests that *ad valorem* tariffs have no impact on quality upgrading as they preserve relative prices faced by the firm and the consumer (Falvey, 1979; Feenstra 1988).[31] None of these models, however, explore the implication of tariff protection on product quality where products contain internationally traded intermediate inputs such as fabric. Further, they look at the production responses within a single firm or country and do not evaluate how tariff protection alters the relative incentive across countries to produce goods of different qualities.

Most apparel firms located in Lesotho are subsidiaries of multinational firms that are continuously considering the relative profitability of production in Lesotho and locations such as China. Other apparel firms sell to the US through so called 'full package' intermediaries from East Asia. These 'full package' suppliers compete with others for orders in the US and Europe (Lall, 2005). They then contract these out to their associated apparel producers, either through competitive bidding or through

[31] Krishna (1987) presents an imperfect competition model where the firm's choice of output and quality is influenced by ad valorem tariff rates.

some allocation rule. The allocation process again is dependent on the relative profitability of production across different locations.

Under international trade with the costless transfer of goods, Lesotho (the home country) will therefore produce all goods for which the domestic price (cost) is less than the competing foreign supplier's price. In terms of unit labor costs and fabric costs the requirement is specified as:

$$a(z)w + FC(j) \leq a^*(z)w^* + FC^*(j) \tag{10}$$

where an * denotes foreign. Under free trade where fabric is internationally traded and there are no differences in unit fabric costs ($FC(j) = FC^*(j)$), this condition reduces to[32]

$$\frac{w}{w^*} \leq A(z) \equiv \frac{a^*(z)}{a(z)}. \tag{11}$$

In other words, home exports all apparel products for which its relative wages are less than or equal to its relative productivity. This outcome is equivalent to that of the Dornbusch, Fischer and Samuelson (1977) Ricardian model with a continuum of goods. A further implication is that Home produces all varieties of products z that meet the condition. **The fabric content therefore has no influence on what is produced by the home country.**

This changes once we introduce tariffs and tariff preferences. Once tariffs are introduced, what determines whether the home country exports product $y(zj)$ is whether the tariff inclusive price of its good in the US market is less than or equal to its foreign competitors:

$$c(zj)(1+t) \leq c^*(zj)(1+t^*) \tag{12}$$

To simplify the model we have assumed that the *ad valorem* tariff does not vary by (zj) combination.[33] Expressing this relationship in terms of unit labor costs and fabric costs (from equation 1) gives:

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[32] Alternatively, the condition can be framed in terms of Relative Unit Labor costs,

$$RULC(z) = \frac{wa(z)}{w^*a^*(z)} \leq 1$$

where home exports all products where its unit labor costs are lower than its foreign competitors.

[33] Apparel tariffs vary enormously according to the type of fabric used and in some cases according to the quantity and amount of fabric used in production. Extending the model to allow for variation in tariffs across z and j does not alter the main insights of the theory.

$$\left[a(z)w+\theta(zj)PF(zj)\right]\left(1+t\right)\leq\left[a^{*}(z)w^{*}+\theta(zj)PF^{*}(zj)\right]\left(1+t^{*}\right) \quad (13)$$

Further manipulation expresses the relationship in terms of relative unit labor costs

$$\frac{wa(z)}{w^{*}a^{*}(z)}\leq\frac{\left(1+t^{*}\right)}{\left(1+t\right)}+\frac{\theta(zj)}{w^{*}a^{*}(z)}\left[\frac{(1+t^{*})}{(1+t)}FP^{*}(zj)-FP(zj)\right] \quad (14)$$

The cut off point defining what products will be exported by the home country is now a function of relative tariff rates as well as the cost of fabric. To explore the implications for product choice under AGOA, four different scenarios are compared:

(a) Case 1: Pre AGOA with equal tariffs and access to competitively priced fabric,

(b) Case 2: AGOA tariff preferences on products with no fabric content,

(c) Case 3: AGOA tariff preferences for non-LDC Special Rule beneficiaries,

(d) Case 4: AGOA tariff preferences for LDC Special Rule beneficiaries

Case 1: No preferences, equivalent tariff rates (t = t) and competitive inputs suppliers (FP(zj) = FP*(zj))*

In the first scenario the US imposes equal tariffs on home and foreign producers. As in many of the AGOA countries, the home country offers a duty rebate scheme to exporters. Home apparel exporters therefore have access to internationally priced fabric, $FP(zj)= FP^{*}(zj)$.

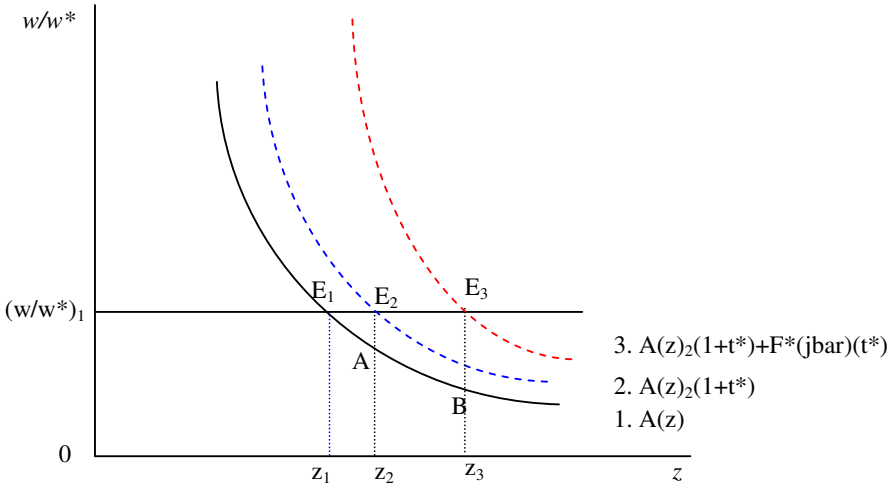
The product allocation condition devolves to equation (11). Tariffs affect both countries equivalently and unit fabric cost components cancel each other out. The geographic location of production is determined entirely by relative unit labor costs, with specialization according to comparative advantage. Fabric intensity has no bearing on what the country exports. The home country therefore exports all fabric varieties of products where it has a comparative advantage, as determined by relative unit labor costs. Tariff protection in this scenario introduces no quality bias.

Diagrammatically, this outcome is represented by curve 1 in Figure 6. The curve depict the relative productivity of the home country where products (z) are ordered such that the relative productivity of the home country, A(z), diminishes as z increases. Also imposed is the assumption that the apparel sector is small relative to the rest of the economy or that there is excess labor leading to constant wages. The equilibrium cut-off point is determined by relative wages w/w^{*} on the vertical axis.

Home country produces and exports all products for which relative productivity is greater than its relative wages, i.e. all products to the left of the intersection between w/w^* and A(z).

In this scenario, tariffs have no impact on the relative productivity curve. At existing relative wages w/w^*_1, the home country produces and exports all products and their varieties over the range $0z_1$.

Figure 6 Tariff preferences and product choice



Case 2: Preferential access granted to home (t=0, t>0) and apparel contains no fabric*

In the second scenario US grants the home country a tariff preference under AGOA (t = 0). Foreign competitors, however, continue to face a tariff of t*. We also assume that clothing requires no intermediate inputs such as fabric ($\theta(zj)PF(zj) = \theta(zj)PF^*(zj)$ = 0) and that production is entirely made up of labor services, as in Ricardian model. Equation (14) under these assumptions simplifies to

$$\frac{wa(z)}{w^*a^*(z)} \leq \left(1+t^*\right) \qquad (15)$$

This impact is revealed by a shift upwards of the relative productivity curve in the diagram by (1+t*). The effect is an increase in the range of products exported by the home country from $0z_1$ to $0z_2$. The tariff preference therefore allows the home country to export products in which it has no comparative advantage. In fact, the tariff preference enables the home country to export products in which it is up to 1+t* times

less efficient in producing than its international competitors (represented by distance E_2-A).[34] For example, a tariff preference of 20 percent enables the home country to export products where its unit labor costs are up to 20 percent greater than their foreign competitors. The greater the preference relative to competitors, the greater is the expected impact on range and value of export products.

The tariff preference is also expected to raise exports of products Home already exports (i.e. the intensive margin). The tariff preference of 20 percent, for example, raises the profitability of existing exports by 20 percent and is hence expected to increase supply of existing firms.[35] Alternatively, the preferences enable the entry of new firms who are up to 20 percent less efficient than existing firms to export existing products. The tariff preferences therefore stimulate exports of new products (extensive margin) and existing products (intensive margin).

Case 3: Preferential access granted to home (t=0, t>0), apparel contains fabric and rules of origin constraints on fabric inputs*

This scenario reflects the situation for non-LDC Special Rule AGOA countries such as South Africa and Mauritius for most of the post 2001 period. Apparel from these countries has preferential access into the US market, but production is subject to a two-stage transformation requirement. Apparel producers from these countries, for example, are unable to utilize foreign fabric (unless from the USA) in production. If these countries produced fabric at internationally competitive prices ($FP(zj) = FP^*(zj)$), then the outcome will be similar the one to be explained in case 4. However, if local fabric is more expensive than foreign fabric (($FP(zj) > FP^*(zj)$), the allocation condition becomes:

$$\frac{wa(z)}{w^*a^*(z)} \leq (1+t^*) + \frac{\theta(zj)}{w^*a^*(z)}\left[(1+t^*)FP^*(zj) - FP(zj)\right] \qquad (14)$$

[34] This assumes that the producer captures the full tariff rent. Olarreaga and Özden (2005) find that AGOA countries only captured 38% of the apparel tariff rent which is indicative of concentrated importing enterprises that are able to capture some of the tariff rent. It is only under the extreme outcome where the AGOA exporter captures none of the tariff rent that the outcomes will remain equivalent to the DFS model.

[35] The current model assumes constant returns to scale. Mattoo et al. (2003) develop a simple model with decreasing returns and simple price-taking behaviour and show how both tariff preferences and waivers of rules of origin increase exports of existing products. They do not deal with the impact on product quality.

The impact on clothing production relative to the pre-AGOA period is ambiguous. While the home country is granted a tariff preference, it now has to utilize more expensive domestic fabric. In comparison, prior to AGOA the home exporter faced import tariffs, but could use internationally priced fabric under the duty rebate schemes. It is therefore possible that high domestic fabric costs more than offset the tariff preference and that the home firm continues to export under MFN rates. In this scenario, domestic prices are so high as to reduce the right hand side of equation (14) to be less than 1 implying a disincentive compared to Case 1.

Where an advantage remains to export under the preference scheme, the relative preference is a positive function of fabric price differences $[(1+t^*)FP^*(zj) - FP(zj)]$ and the input-output coefficient $\theta(zj)$. Without knowing the interaction, between these two variables, it is not possible to identify changes in relative incentives across all products and varieties. It suffices to note, however, that the preferences under AGOA do not have uniform impact across all product varieties, unlike the pre-AGOA scenario in Case 1. Tariff preferences therefore distort product *and* variety (or quality) selection based on comparative advantage.[36]

We expand on this effect using a specific case where home firms have access to internationally priced fabric, either from competitive domestic suppliers, or from a waiver of the rules of origin.

Case 4: Preferential access granted to home (t=0, t>0), apparel contains fabric and derogation from rules of origin*

This scenario models the rules of origin waiver for wearing granted to lesser-developed countries under AGOA. Under this waiver the home exporters are granted duty free access into the US market for apparel products produced using third-country (non- local and non-US) fabric or yarn. Given our assumption of no-transport costs, fabric prices are therefore equal in both countries ($FP(zj) = FP^*(zj)$).

The condition defining what products are exported by home reduces to

[36] Note that for product-variety combinations with common positive price differences ($(1+t^*)FP^*(zj) - FP(zj)$), the preference is proportional to fabric-intensity $\theta(zj)$. For product-variety combinations with a negative value for ($(1+t^*)FP^*(zj) - FP(zj)$), the incentive is for firms to minimise the fabric content $\theta(zj)$.

$$\frac{wa(z)}{w^*a^*(z)} \leq \left(1+t^*\right)+\frac{t^*\theta(zj)FP^*(zj)}{w^*a^*(z)}. \qquad (15)$$

As in Case 3, the AGOA preferences alter relative incentives to export products of different unit fabric contents. In particular, the tariff preference is greater for products with higher unit fabric costs. This is revealed by the second term on the right hand side which is positive and increasing in $\theta(zj)FP(zj)$. This is also shown in Figure 6 by a shift outwards to curve (4) for products with unit factor costs given by F*(jbar) (>0). The home country is able to expand the range of products (the extensive margin) it exports to $0z_3$. The distance of these firms from the productivity frontier is represented by E_3-B.

In other words, the tariff preference affects the home country's exports in two ways. Firstly, it raises the relative unit labor cost threshold by $(1+t^*)$, which is equivalent to what we would expect in a tariff adjusted DFS model. Secondly, the threshold defining the cut-off-point is higher for fabric intensive products. This arises because tariffs not only tax foreign unit labor costs, but also tax the fabric content of the product. **The total tariff equivalent preference per unit labor cost is therefore an increasing function of the unit fabric costs.**

This is better shown in a slightly modified version of equation (15). Let $\lambda(zj)$ denote the share of fabric in total costs of producing a unit of good $y(zj)$ (i.e. $FC(zj)/c(zj)$). The labor cost share of production is then 1- $\lambda(zj)$. Substituting these shares into equation (15) yields

$$\frac{wa(z)}{w^*a^*(z)} \leq \left(1+t^*\right)+\frac{t^*\lambda^*(zj)}{1-\lambda^*(zj)}. \qquad (16)$$

In clothing products that use no fabric (i.e. $\lambda^*(zj) = 0$) a 20 percent tariff preference enables home to export products to the US where it is up to 20 percent less efficient at producing. The distortion is even greater for products where fabric accounts for a large proportion of overall costs. For example, in varieties where foreign value added is 10 percent of costs ($1-\lambda^*(zj) = 0.1$), a 20 percent tariff will enable home to export products where it is up to 3 times less efficient (or unit labor costs are 200 percent greater). The preferences

The tariff effects are greatest for fabric intensive products *even amongst those goods where it has a comparative advantage* (the intensive margin). Take for

example, standard cut jeans where we assume that the home country has a comparative advantage in producing (i.e. their relative unit labor costs are less than 1). As shown in Case 1, when no tariff preferences are granted, home firms produce all fabric-based varieties of jeans. Assume for example that the fabric cost shares for jeans produced using the various qualities of fabric are as follows: low fabric quality ($\lambda^*(zj) = 0.2$), medium fabric quality ($\lambda^*(zj) = 0.5$) and high fabric quality ($\theta(zj) = 0.8$). The 20 percent tariff preference is equivalent to 25 percent *effective subsidy* to producers of low quality jeans, a 40 percent subsidy to medium quality jeans producers and a 100 percent subsidy to high quality jeans producers. The tariff preferences therefore create incentives for firms to expand production most in the low value-added fabric-intensive varieties of products they are already exporting.

In addition, the preferences encourage entry of the least efficient firms into the most fabric-intensive apparel products. Using the example above, home firms are able to export high fabric quality jeans even if they are half as productive as internationally competitive firms.

We can also see now how vulnerable such firms in Lesotho are to international price volatility (either through exchange rates or international prices), reductions in the MFN tariff rate and the ending of to waiver of the rules of origin. Using the example above, lowering the US MFN tariff by half reduces the effective subsidy to low quality jeans to 12.5 percent, medium quality jeans to 20 percent and high quality jeans to 50 percent. Preference erosion could therefore provide an additional blow that would be seriously underestimated if models fail to capture the contribution of the rule of origin preference.

Other effects

So far we have focused on the effect of tariff preferences on the production equilibrium in a partial equilibrium setting where wages are fixed. However, as the sector grows and full employment is achieved wages will begin to rise.[37] This will give rise to two additional effects. Firstly, the adjustment process will give rise to hyper-specialisation in the most fabric-intensive products. As shown by condition (16), the return to producers of high fabric content apparel varieties is multiple of the

[37] In the DFS model, the equilibrium range of products exported is achieved through the imposition of a balanced budget condition where wage income equals expenditure.

return to low fabric content apparel producers.[38] Wage increases will therefore first drive out producers of low fabric-content varieties. Secondly, wage increases in response to growth in the apparel sector may actually drive out export firms in other sectors where the home country has a comparative advantage.

Other considerations relate to the development of a comparative advantage in the nascent industry. Our model raises a number concerns in relation to this. Firstly, the incentives steer firms to producing products with the lowest value addition, rather than up the value-chain. Secondly, the incentives enable entry of highly inefficient firms (in terms of productivity relative to international competitors) into the most fabric-intensive products. These firms are the most vulnerable to price fluctuations, preference erosion and the ending of the rules of origin waiver. Thirdly, the preferences discourage backward linkages through discouraging the addition of value added services from other sectors and the inducing exporters to use expensive fabric that is less likely to be produced in poor countries.

[38] In the example provided, firms producing the variety of product z with a fabric cost share of 80 percent are able to pay workers 1.6 times the wage of workers in firms producing the variety where the fabric only makes up 10 percent of costs.

Empirical application

Our background review identified three distinct trade regimes facing AGOA recipients from the mid-1990s: (a) Quotas under the MFA, (b) AGOA preferences including the third country fabric provision, and (c) the ending of the MFA. Our theory suggests that each of these trade regimes had a particular impact on the volume and quality of apparel exports in AGOA and non-AGOA countries. These can be summarized as follows:

Apparel quotas under the MFA induced non-binding quota restricted countries to export low value added apparel products based on the intensive use of fabric. AGOA preferences raised the value and range of apparel products exported by beneficiary countries with relatively strong growth in imports of products facing high tariff preference margins and from countries eligible for the third-country fabric provision. The third-country fabric provision also raised the incentive for beneficiaries to export low value added, fabric-intensive apparel products relative to other AGOA beneficiaries.

Finally, the end of the MFA induced quota restricted countries to shift towards lower quality products and varieties within each product category. The removal of quotas was therefore particularly detrimental to AGOA countries as it encouraged entry by previously quota restricted countries into those products in which AGOA recipients were specialized.

In this section, we 'test' these various hypotheses. Two main approaches are followed. In the first approach, we focus on identifying changes in the fabric-content of apparel exports under the preferences using a price-based analysis. This involves the estimation of price equations for clothing using highly disaggregated US import data. Using these estimates we infer changes in the fabric and valued-added content of clothing exports in response to the AGOA preferences and MFA quotas.

In the second approach, we focus on changes in the value and range of apparel exports to the US, with particular attention placed on across-product shifts in the composition of exports towards fabric-intensive and low value-added products. We identify changes associated with the AGOA preferences using a difference-in-difference estimation.

We find considerable support for our theoretical predictions. During the MFA, AGOA countries and Lesotho in particular produced fabric-intensive clothing products with low value addition relative to quota-constrained (and other) countries. AGOA resulted in a strong export response by firms in beneficiary countries. The effects were strongest in products with high tariff preferences and from countries eligible for the third-country fabric provision. The export response by other AGOA members was poor.

We find some support for our hypothesis that the third-country fabric provision induced a rise in the fabric-content of exports. The composition of apparel exports by designated 'lesser-developed' AGOA countries shifted towards low-value added products and mid-range fabric-intensity products. However, our price-analysis, which also captures within-product shifts in variety, reveals no increase in the fabric content of these exports. Lesser-developed beneficiaries therefore predominantly expanded output of existing varieties within each product (which as shown earlier contain relatively little value addition and lots of fabric) rather than (or by more than) the shift towards more fabric-intensive varieties.

Finally, as predicted by our theory, the ending of the MFA, adversely affected exports from AGOA recipients, raised the fabric content of Chinese exports and reduced the fabric-content of the non-LDC AGOA countries. The fabric-content of lesser-developed AGOA apparel exports remained constant. Our hypothesis of rising fabric-content in response to the third-country fabric provision is therefore realized only after the end of the MFA and only with respect to other AGOA countries.

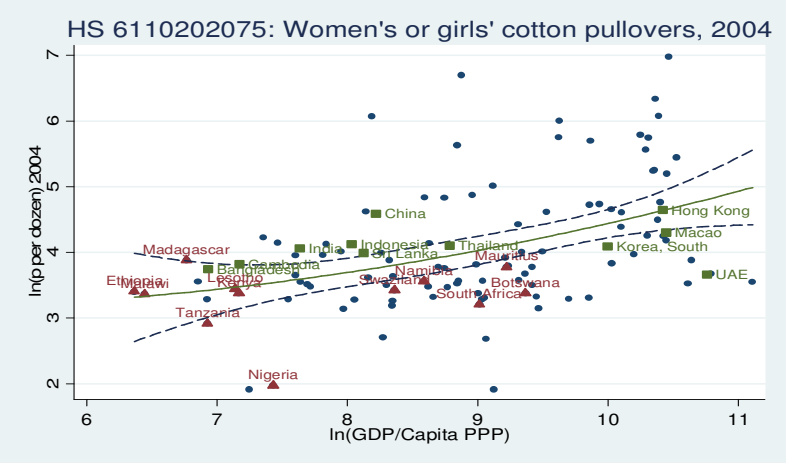
Price-based analysis

We commence with an analysis of product prices. Our expectations are threefold. Firstly, the MFA induced quality upgrading in quota restricted countries and quality downgrading in non-quota restricted countries. Secondly, AGOA's third-country fabric provision induced lesser-developed countries to specialize in low value added, high fabric content apparel products. Thirdly, the end of the MFA led to a downgrading in the quality of products exported by previously quota restricted countries and the opposite effects in other countries.

In what follows, we test these hypotheses using price data. For data, we draw on time-consistent 10-digit HTS import data for the US from 1996-2008.[39] The data gives rise to approx 1202 product lines for Clothing (HS61, 62 and various sub-codes of HS 64 & 65) covering 224 countries. The data base contains data on import values and quantities by product, country and year. Imports are valued using the customs value and the calculated unit values therefore exclude the cost of insurance, freight and customs duties.

We refer to the 10-digit HTS lines as *products*, but interpret variation in prices within these lines as arising from differences in the quality of apparel *varieties*. There is substantial within-product heterogeneity in prices, as is shown in the scatter plot of unit values on PPP GDP (both in logarithmic form) of Lesotho's top export product in 2004 (Figure 7). Within-product quality variation is closely associated with income per capita (see also Hummels and Klenow (2002) and Schott (2004)) with the lesser-developed AGOA recipients predominantly situated at the low-quality, low-income per capita end of the spectrum. There are exceptions. Apparel unit values of China, India and Indonesia, who were amongst the top 4 quota restricted countries under the MFA (Brambilla et al. (2007), are higher than predicted. This is consistent theoretical predictions of quality upgrading in response to quota restrictions.

Figure 7: Unit values and level of development: Top Apparel product exported by Lesotho in 2004 (Women's or girls' other pullovers of cotton, knitted).



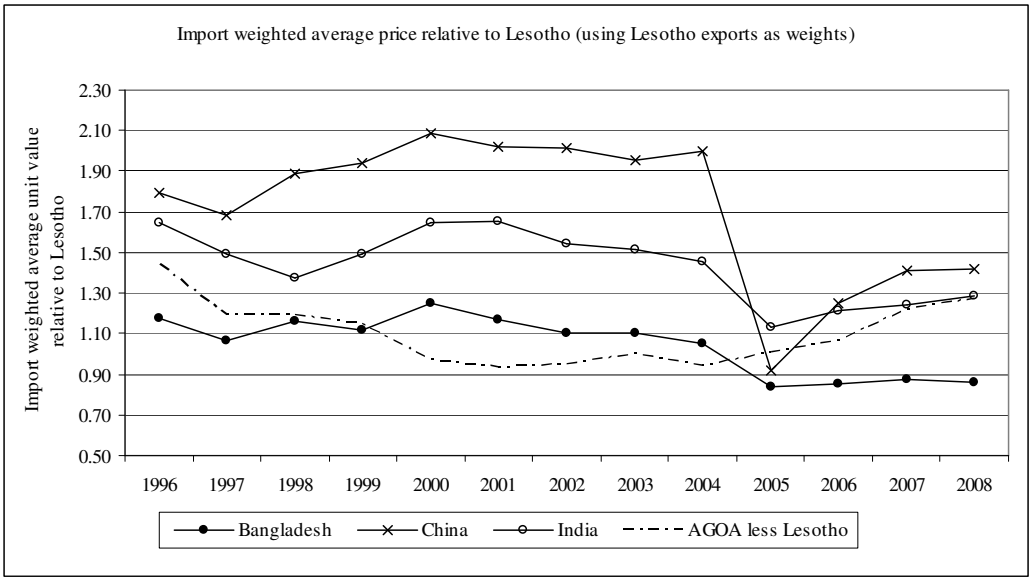
Notes: Triangles are AGOA countries eligible to export apparel. Square blocks reflect the top quota restricted countries from 1984-2004 as identified by Brambilla et al. (2007)

[39] The HTS classification changed frequently throughout the period as new product lines were introduced and old product lines were aggregated. We use the Pierce and Schott (2009) concordance programme to construct a time-consistent classification for the full period.

Preliminary support for the effect of the different trade regimes on product quality is also provided in Figure 8 and Figure 9. Figure 8 presents indicators of *within-product* price differences for selected countries relative to Lesotho. These are calculated by aggregating up the log ratio of export prices relative to Lesotho using Lesotho export values as weights. Higher values reflect the export of more expensive apparel varieties than Lesotho within each product line.

Figure 9 presents indicators of *across-product* shifts in the composition of apparel exports to the US. The variable measures the average price (per square meter equivalent) of each apparel product. The import weights for each country vary by year, but the product prices are constant and are equal to the median product price of the entire sample. Reductions in the average price, therefore reflects shifts in the composition of apparel exports to the US towards lower priced products.

Figure 8: Import weighted average price relative to Lesotho



Note: The import weighted average price for country *c* is calculated as $\overline{p}_{ct} = \prod (p_{ict} / p_{iLt})^{w_{iLt}}$ where w_{iLt} is the share of product *i* in Lesotho's apparel exports to the US, P_{iLT} is the price of Lesotho exports and P_{ict} is the price of the comparator country apparel exports.

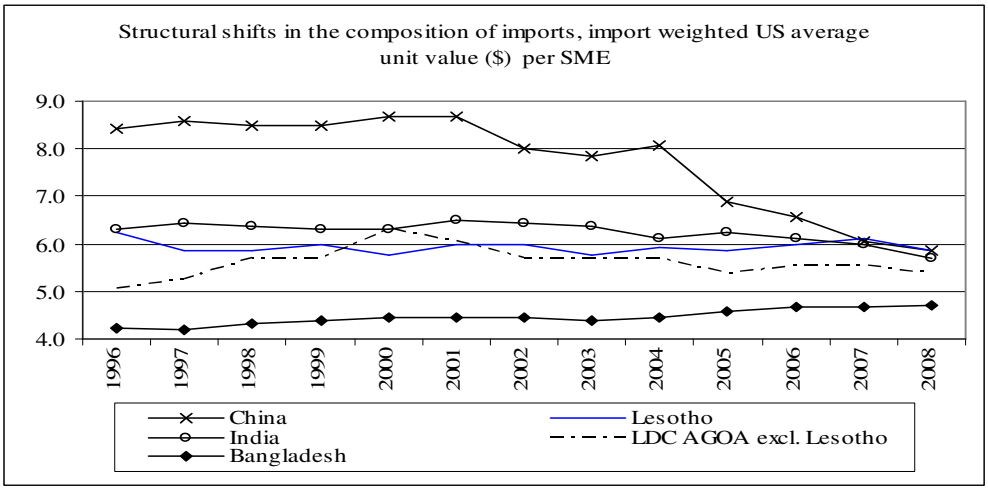
As found earlier in Table 4 prices of apparel varieties vary enormously within products. Chinese apparel exports to the US were on average 1.7 times higher than those of Lesotho in 1997, but then rose to 2.1 times higher in 2000 (Figure 8). Bangladesh and India, two other highly quota restricted countries, also exported more

expensive apparel varieties than Lesotho within each HS 10 digit line. In all these cases, apparel unit values declined relative to Lesotho after the implementation of AGOA in 2001. This is consistent with quality or fabric-content upgrading and the capture of tariff rents in response to the AGOA preferences.

However, it is the dramatic decline in relative prices after the ending of the MFA in 2005 that is most striking. For example, the export price of Chinese apparel varieties declined from 1.95 times to 90 percent of those from Lesotho in one year. There was a slight rebound from 2006 as new quotas on Chinese apparel exports were imposed, but by 2008 relative prices had still fallen by over 55 percentage points from 2004.

Figure 9 also reveals evidence of substantial *across*-product shifts in the composition of exports by previously quota restricted countries towards lower priced apparel products (Brambilla et al. 2007; Harrigan and Barrows 2009). This is most noticeable for China, whose exports were initially concentrated in relatively expensive 10-digit apparel products. In 2002 Chinese quotas imposed under Phase I, II and III of the MFA were eliminated in response to China's entry into the WTO. The consequence was a shift in the composition of Chinese apparel exports towards lower priced products. Further shifts are evident in 2005 after the ending of Phase IV of MFA. By 2008 the import weighted median price of Chinese apparel exports was very similar to those of Lesotho.

Figure 9: Structural shifts in the composition of US apparel imports



Note: The import weighted average price for country *c* is calculated as $psme_{ct} = \sum m_{ict}\overline{p}_i$ where $\overline{p}_i$ is the median price of product *i* over the entire period and m_{ict} is the share of *i* in country *c*'s apparel exports to the US.

The trends in these diagrams provide some support for our hypotheses, at least with respect to the effect of quotas on quota-restricted countries. In the empirical analysis that follows, we use the within-product and across-product variation to test for significant changes in the quality and fabric-content of apparel exports by AGOA recipients. First, however, we require a formal model of the price relationship.

Specification of the price equation

The price equation we develop follows standard approaches used in the empirical research on price heterogeneity (Feenstra 2004; Schott, 2004). Demand in the US for clothing imports from country * is modeled as $y = d^*(p,q,I)$ where I is US expenditure on clothing (from all sources including home production), p is the US domestic price of the imported good and q is the price of domestic and foreign substitutes. With an *ad valorem* tariff t on imports, profits of the foreign firm in their local currency are represented as

$$\pi^* = \frac{py}{e(1+t)} - C^*[y] \tag{17}$$

where C^* denotes the cost function, e is the dollar to foreign currency exchange rate and p is the tariff inclusive price of the imported clothing product ($p = p^*(1+t)$).

Under profit maximisation, the foreign firm sets prices according to the First Order Condition

$$p\left(1-\frac{1}{\eta^*}\right) = (1+t)ec^*[d^*(p,q,I)] \tag{18}$$

where $\eta^* \equiv -(\partial d^*(p,q,I)/\partial p)(p/d^*)$ is the elasticity of import demand and c^* is marginal cost. The US domestic price of imports is therefore a markup of the foreign marginal production costs converted to dollars and inclusive of the *ad valorem* tariff rate. The extent of the markup is dependent on the elasticity of import demand. In a perfectly competitive market structure where the elasticity of import demand is infinite ($\eta^* \to \infty$), we obtain the standard price equals marginal cost optimizing condition.

Following Feenstra (2004), we simplify the model and assume that the income elasticity of demand is unity such that changes in income do not affect the price

elasticities. The elasticity of import demand can then be written as functions of the price ratio of domestic and imported goods, or $\eta^*(p/q)$.

To solve for the import price in terms of the parameters, however, the cost function requires further specification. The particular focus of this study is the role of fabric in the production of clothing. We therefore represent clothing production as a function of fabric (*F*) and value added services (*VA*) (e.g. labor services) as follows:

$$y = f(F, VA, 1)$$

Under the assumptions that the production function is continuous, strictly increasing and characterised by constant returns to scale, the associated cost function can be written as a function of the price of inputs (fabric (*pf*) and value added (*pva*)) and output *y* as follows:

$$C^*(pf, pva, y) = yc^*(pf, pva, 1) \tag{19}$$

where $c^*(pf, pva, 1)$ is the cost of one unit of output and is equal to both marginal costs and average costs.[40] Substituting these into the optimal price condition, the import prices can be solved as a function of the parameters:

$$p = \phi[(1+t)ec^*(pf, pva), q, I] \tag{20}$$

To estimate the price relationship, we specify (4) as a log-linear function, indexed by time *t*

$$\begin{aligned} \ln p_t = {} & \alpha + \beta_1 \ln c_t^* + \beta_2 \ln e_t + \beta_3 \ln q_t \\ & + \beta_4 \ln(1 + tariff_t) + \beta_5 I_t + \varepsilon_t \end{aligned} \tag{21}$$

This specification allows us to test various hypotheses relating to the pricing relationship. Firstly, we are able to test the hypothesis of symmetric pass-through of the exchange rate and foreign costs. From (4), increases in the dollar value of foreign costs (*ec**) have the same impact on the US dollar price of clothing exports, irrespective of whether they originate from foreign production cost increases or a depreciation of the dollar. Secondly, we can test the hypothesis of symmetric pass-through of the tariff and exchange rate. According to the price equation (4) the coefficient on the exchange rate β_2 is equal to that on the tariff variable β_4. The final

[40] We could also specify a decreasing or increasing returns to scale production function where the cost function is specified as $C^*=y^{1/k}C^*(pf,pva,1)$ and k is the degree of homogeneity.

testable hypothesis is that p is homogenous of degree 1 in its arguments (β_1 (=β_2=β_4) +β_3+β_5 =1).

The current specification, however, does not yet enable us to identify the fabric content of clothing products. To do this requires the unit cost function c^* to be specified. We impose a unit cost function derived from a constant return to scale Cobb-Douglas production function:

$$c^*_{ict} = A_t \, pf^{\alpha}_{ict} \, pva^{1-\alpha}_{ict} \tag{22}$$

This specification imposes the restriction that the proportion of expenditure spent by the firm on fabric prices is constant and is given by α. The unit cost function also satisfies requirement of homogeneity of degree zero in prices. Substituting (22) into (21) gives the following equation:

$$\begin{aligned} \ln p_t = {} & \alpha + \delta_1 \ln pf_t + \delta_2 \ln pva_t + \beta_2 \ln e_t + \beta_3 \ln q_t \\ & + \beta_4 \ln(1 + tariff_t) + \beta_5 I_t + \varepsilon_t \end{aligned} \tag{23}$$

where $\delta_1 = \beta_1 \alpha$ and $\delta_2 = \beta_1 (1-\alpha)$. Given the assumptions imposed, the fabric content of the clothing product can be calculated as $\delta_1 / (\delta_1 + \delta_2) = \beta_1 \alpha / (\beta_1 \alpha + \beta_1 (1-\alpha)) = \alpha$.

Data and fabric prices

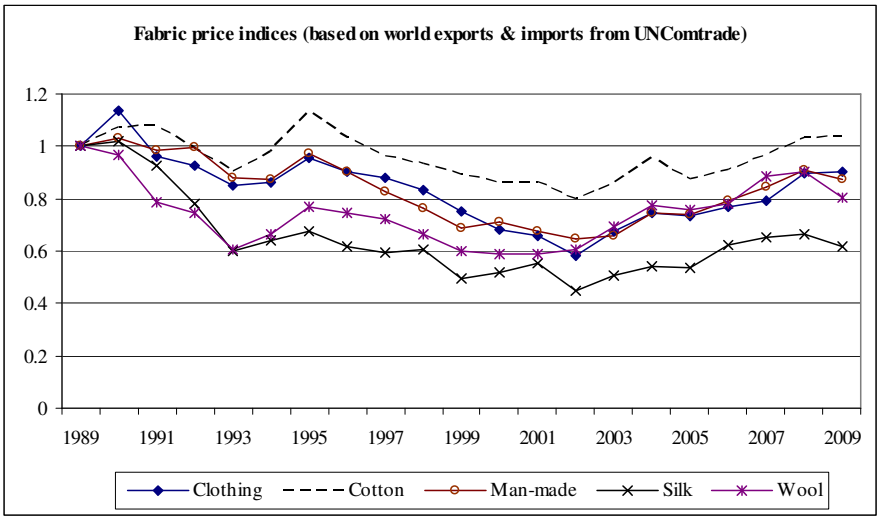
In the estimates presented, the log import price of clothing *exclusive* of tariffs is used as the dependent variable. This does not affect the results, except that the pass-through of tariffs to US domestic prices of imports is calculated as 1-δ_7. The independent variables include the foreign industry value added deflator (in foreign currency) for *pva*, the US dollar to foreign currency exchange rate for *e* and US Producer Prices (at 6-digit NAICS level) and competitor clothing unit values (at 10-digit level) for substitute products *q*. Applied tariff rates at the hs4-digit level are used for (1+*t*).[41]

[41] We use the average tariff at the HS 4-digit level to avoid erroneous correlations arising from the construction of the variables (tariff rate = duty/import value and price = import value/import quantity). Using the average may also reduce biases associated with the potential endogeneity of product level tariff rates. The trade data are obtained from Peter Schott who constructed the database using US Customs Service data. US producer prices are obtained from the Bureau of Labor Statistics, fabric prices are constructed using UNcomtrade data (see later) and the exchange rates are obtained from the World Bank World Development Indicator database. Country specific tariff rates at the 4-digit HS level

For fabric prices, we calculate Tornqvist price indices for silk (HS50), wool and fine animal hair (HS51), cotton (HS 52) and man made fiber and staple (HS 54 & HS55) using unit values derived from world trade in fabrics.[42] The data are obtained from UNComtrade and the average of the fabric prices calculated using world exports and world imports are used.

Figure 10 presents the trends in fabric prices, measured in US dollars. There was a general decline from 1989 to 2002 followed by an increase in fabric prices. These trends in part reflect changes in the value of the dollar. See also the average unit value of wearing apparel (HS 61 and HS 62), which follows the price of man-made fabrics very closely.[43]

Figure 10: Fabric price indices



Notes: Based on Tornqvist price index constructed using hs 6-digit unit values obtained from UnComtrade trade data. Hs 6-digit product lines for fabric (HS (50 - silk, 51-wool, fine animal hair, 52-cotton, 54-man made fiber, 55 - man-made staple).

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are constructed as the sum of duties collected over value of imports. Competitor clothing prices are calculated as the geometric average price of all other countries (using import values as weights).

[42] The following HS codes for synthetic fibres are also included in man-made products: 550110, 550120, 550130, 550190, 550200, 550310, 550320, 550330, 550340, 550390, 550410, 550490, 550610, 550620, 550630, 550690.

[43] The fabric prices correspond closely with the dominant agricultural commodity used to produce the fabric. For example, there is a close fit between cotton-based fabric and raw cotton prices, and wool-based fabric and wool prices.

In estimating the apparel price equations, the fabric price (silk, cotton, man-made, wool, or weighted average of these) attributed to each 10-digit HTS clothing product is based on the dominant fabric used in producing the good.[44] This may nevertheless lead to some bias in the estimates as products are often produced using different combinations of fabric types. We also do not have product specific measures of foreign productivity, foreign value added prices and competing US product prices. As a consequence we are forced to use more aggregated proxies for these variables than is desirable.[45]

We now separately apply the specified price equations to the three distinct trade regimes.

Quotas under the MFA

We first estimate whether the fabric-intensity of apparel produced in AGOA countries differs from other countries from 1996 through 2004 when quotas under the MFA were enforced. Our expectation is that quotas under the MFA induced AGOA countries to export low value-added products and varieties made up of cheap fabric.

Table 5 presents the regression results. The first column presents the benchmark regression of the equation

$$\ln p^*_{ict} = \alpha_{ic} + \delta_1 \ln pf_{ft} + \delta_2 \ln pva_{ct} + \delta_3 \ln GDPwork_{ct} + \delta_4 \ln e_{ct} + \delta_5 \ln usppi_{naics,t} + \delta_6 \ln Pcompete_{it} - \delta_7 \ln(1 + tariff_{hs4,ct}) + \lambda_t + \varepsilon_{ict}$$

This specification differs from the earlier specification in two respects. Real GDP per worker measured in PPP prices is included to capture the impact on prices of general productivity improvements in the economy and relative technological advantage in producing higher-quality goods (Hummels and Klenow 2002).[46] Country by product and time fixed effects are included to account for time invariant effects such as distance and elasticities of demand and common shocks across all product varieties.

The coefficients are as expected. The dollar price of US clothing imports rise with increases in foreign and US competitor's prices. Increases in GDP per capita are positively associated with export unit values, suggesting that the quality effect of

[44] The allocation was done manually on the basis of the product description.

[45] See Goldberg and Knetter (1997) on how aggregate production cost indices can bias the exchange-rate pass-through downwards.

[46] Although the industry value added price is the net effect of productivity and nominal factor prices, the real GDP per worker measure also embodies productivity improvements in the services sector.

Hummels and Klenow (2002) dominates the productivity effect (which would result in a negative coefficient). Applied tariffs are estimated to reduce the fob price of apparel products with a coefficient of -0.60.[47] Foreigners therefore absorb 60 percent of the tariff increase either through lower mark-ups (in case of imperfect competition) and/or reduced marginal costs (from upward sloping supply curve). This is a higher share than is estimated for Trucks and Cycles by Feenstra (1989).

Production costs also matter. US clothing import prices are equally affected by increases in foreign fabric costs and value added costs, implying a fabric share coefficient of approximately 50 percent.[48] In addition, the impact on prices from increases in production costs very close to the effect proportionate depreciation of the dollar. [49] The estimated pass-through coefficient of 0.6 falls between Feenstra's (1989) estimates for Trucks (0.63) and Cars (0.71) and more general estimates based on aggregate import data (Marazzi et al. 2005, Gopinath and Rigobon 2008).

While the coefficients are of the expected sign, the model fails the homogeneity test. The coefficients on fabric prices, value added, foreign competitor prices and US producer prices sum to 0.68, which is significantly lower than 1. The hypothesis of symmetric pass-through of the tariff and exchange rate is also rejected. The impact on US import prices from a depreciation of the dollar is significantly larger than from an equivalent increase in tariffs.

However, these failures do not necessarily imply a rejection of the price model. The homogeneity test does not include the US income effect which is subsumed in year fixed effect coefficients. Further, changes in the exchange rate, domestic costs or tariffs may affect the quota rents and product quality rather than internal prices.[50] Another reason is that we have imposed common coefficients on all

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[47] The tariff rates are calculated as duty collected divided by import value. They therefore take into account the various preferences applied. However, the estimates do not take into account the effect of clothing quotas, which were widely used prior to 2005 under the MFA.

[48] The coefficients on value added and fabric prices are insignificantly different from each other.

[49] Although the difference is statistically significant (at 5 percent level).

[50] Quotas act as a specific tariff on prices. For example, under quotas $p = \mu[ec^*(1+t)+\lambda]$ where μ is the markup, e is the dollar to foreign exchange rate and λ is the specific tariff effect of the quota. While c^* may be homogenous of degree 1 in input prices, p is not (unlike case where $p = \mu[ec^*(1+t)]$. Changes in production costs and the exchange rate may influence the quality composition of imports such that the symmetric pass-through and homogeneity hypotheses fail. For example, under the quota a x% increase in production costs for all varieties raises the price of the more expensive high quality products relative to cheaper products (given the specific tariff effect). Consumers respond by shifting consumption towards the relatively cheaper product. A depreciation of x% also raises the dollar value of production costs of all varieties by an equivalent amount, but is also likely to reduce the specific

clothing products across all countries. Fewer instances of rejection are found for disaggregated HS4 –digit level estimates. The disaggregated results and hypotheses tests are presented in Table A1 in the appendix. We are therefore reasonably satisfied with our basic price equation and proceed with our objective of identifying differences in the fabric-content of AGOA apparel exports.

Table 5: Regression to determine relative fabric-intensity of AGOA apparel exports under the MFA.

Marginal impact	All countries	AGOA relative to quota constrained	AGOA relative to quota constrained, full period	Lesotho relative to AGOA
Period	1996-04	1996-04	1996-08	1996-04
Column	(1)	(2)	(3)	(4)
ln(GDP/capita), PPP	0.126***	0.152***	-0.137***	0.155***
ln(pf)	0.272***	0.214***	0.185***	0.214***
DAGOA x ln(pf)		0.383***	0.293***	0.335***
Dquotacntry x ln(pf)		0.141***	0.246***	0.141***
Dlesotho x ln(pf)				0.220**
ln(pva)	0.237***	0.284***	0.441***	0.285***
DAGOA x ln(pva)		-0.406***	-0.233***	-0.36***
Dquotacntry x ln(pva)		-0.069***	-0.242***	-0.070***
Dlesotho x ln(pva)				-0.125
ln(e)	-0.538***	-0.562***	-0.620***	-0.563***
ln(Pcompete)	0.037***	0.038***	0.045***	0.037***
ln(US ppi)	0.135*	0.128	0.225***	0.130
ln(1+t)	-0.600***	-0.642***	-0.535***	-0.631***
N	255231	255231	384261	255231
	country/product	country/product	country/product	country/product
Fixed effects	year	year	year	year

Notes: all estimates include year fixed effects and country by product fixed effects. Estimates are robust to heteroskedasticity. The equation is estimated over a sample of 160 countries for which the data are available. * p<.1; ** p<.05; *** p<.01

To identify differences in the fabric content of AGOA exports, we modify the above equation and include interactions between a dummy variable for AGOA countries and fabric and value added prices. The basic price equation estimated is therefore specified as:[51]

tariff equivalent of the quota (λ) as US imports decline and the quota becomes less binding. A depreciation of the exchange rate and increases in foreign costs are therefore likely to have different impacts on the quality composition of imports. The relative price of low quality cheaper products falls be a greater amount under a depreciation than an equivalent increase in production costs.

[51] Not all countries became eligible to export apparel in 2001. *DAg* therefore varies by country and time and equals 1 for all years from the time the country becomes eligible to export apparel products. The

$$\begin{aligned}\ln p^{*}_{ict} = {} & \alpha_{ic} + \delta_1 \ln pf_{ft} + \delta_{1b}(DAg \times \ln pf_{ft}) \\ & + \delta_2 \ln pva_{ct} - \delta_{2b}(DAg \times \ln pva_{ct}) \\ & + \delta_3 \ln GDPwork_{ct} + \delta_4 \ln e_{ct} + \delta_5 \ln usppi_{naics,t} + \delta_6 \ln Pcompete_{it} \\ & - \delta_7 \ln(1 + tariff_{hs4,ct}) + \lambda_t + \varepsilon_{ict}\end{aligned} .$$

Evidence in support of our hypothesis would be revealed by a positive coefficient on the interaction with the price of fabric (δ_{1b}) combined with a negative coefficient on the interaction with the price of value added (δ_{2b}). This would imply that AGOA countries produce relatively fabric-intensive clothing products relative to other countries within the sample.

A further issue that we need to consider is the choice of appropriate control group. We are particularly interested in how apparel exports from AGOA countries compare with exports from quota restricted countries. We therefore include interaction terms for the 30 countries facing the most binding quota constraints from 1984-2004 (obtained from Brambilla *et al*. (2007)). The control group in these estimates is non-AGOA non-quota constrained countries.

The various results in columns 2 to 4 consistently indicate that AGOA countries produce fabric-intensive clothing products with low value addition. The marginal coefficient on the fabric price (DAg x ln(pf)) is always positive and significant, while the marginal coefficient in value added prices (DAg x ln(pva)) is always significant and negative. For example, the clothing price elasticity of response to fabric prices is 38.3 percentage points greater in AGOA beneficiaries than in the control group, while the value added elasticity is 40.6 percentage points lower (see column 2 results).

Surprisingly, the results also imply that apparel products are fabric-intensive in quota constrained countries relative to the control group over the MFA period (1996-04) (column 2). This is not necessarily inconsistent with our theory, which predicts that quota constrained countries are more likely to produce apparel products that use of expensive fabric intensively. Of primary interest to us is that apparel

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dummy variable is set equal to 1 for the initial year if eligibility occurred within the first 6 months of the year.

products in AGOA countries are significantly more fabric intensive than both quota constrained countries and the rest of the world.[52]

In column 5 we re-estimate the price equation over the full period 1996-2008. These results provide a provisional insight into the response of AGOA and quota constrained countries in response to the ending of the MFA. The estimates produce some surprising results. The marginal intensity of fabric use in previously quota constrained countries rises, as our theory predicts.[53] The fabric intensity of AGOA apparel remains greater than the control group, but is no longer significantly different from the quota constrained group. The estimated fabric-intensity of AGOA apparel also falls relative to the rest of the world and quota constrained countries, which is again consistent with our predictions.

In the final column (4) we isolate the marginal effect on fabric-intensity for Lesotho. The estimates imply that Lesotho produces relatively fabric intensive apparel compared to the rest of AGOA.

Overall, results imply that AGOA countries and Lesotho in particular produce fabric-intensive clothing products with low value addition. There is also some preliminary evidence the ending of the MFA induced quota constrained countries to increase exports of low value added, fabric-intensive apparel varieties. In contrast, the end of the MFA led AGOA countries to reduce the fabric intensity of their apparel exports. We now turn to an analysis of apparel export responses to the AGOA preferences.

AGOA

While the above estimates identify whether AGOA beneficiaries produce more fabric-intensive clothing products, it does not 'test' whether the implementation of the LDC Special Rule on the use of third country fabric raises the fabric intensity of exports as is suggested by our theory.

To capture this relationship, we modify our price equation to

[52] Simple tests reveal that the coefficients on the AGOA interaction with the prices are significantly different (at 1 percent level) from those on the quota constrained country interactions.

[53] We do not take into account the re-imposition of quotas on selected Chinese apparel products from late 2005. As shown by Harrigan and Barrow (2010) these contained, but did not reverse the import response to the end of the MFA.

$$\begin{aligned}\ln p^{*}_{ict} = {} & \alpha_{ic} + \delta_1 \ln pf_{ft} + \delta_{1b}(Dldc \times \ln pf_{ft}) + \delta_{1c}(D01 \times Dldc \times \ln pf_{ft}) \\ & + \delta_2 \ln pva_{ct} + \delta_{2b}(Dldc \times \ln pva_{ct}) + \delta_{2c}(D01 \times Dldc \times \ln pva_{ct}) \\ & + \delta_3 \ln GDPwork_{ct} + \delta_4 \ln e_{ct} + \delta_5 \ln usppi_{naics,t} + \delta_6 \ln Pcompete_{it} \\ & - \delta_7 \ln(1 + tariff_{hs4,ct}) + \lambda_t + \varepsilon_{ict}\end{aligned}$$

where *Dldc* is a dummy variable for countries eligible for the Special Rule and *D01* denotes a dummy variable that is equal to 1 for the 2001 to 2004 period. This equation exploits the variation pre and post AGOA (but not post MFA), as well as between Special Rule beneficiaries relative to non-beneficiaries. The coefficients (δ_{1c}) and (δ_{2c}) are estimates of the marginal impact on fabric-intensity and value-added-intensity in the LDC Special Rule countries relative to other countries after the implementation of AGOA in 2001. Theory predicts that $\delta_{1c} > 0$ and $\delta_{2c} < 0$.

The first column of results in Table 6 presents the estimated coefficients using all available data over the period 1996-2004. Of main interest to us are the shaded rows (3-5 and 8-9). The results corroborate the findings in Table 5 that LDC Special Fabric Rule recipients produce relatively fabric-intensive products relative to the rest of the world (see the significant positive δ_{2b} (row 3) negative δ_{2d} (row 8)).

However, contrary to our theoretical predictions*, we find no increase in the fabric-intensity of apparel from 2001 to 2004 in response to the AGOA preferences. The coefficients on the interaction terms (D01 x Dldc x ln(pf)) in row 4 and (D01 x Dldc x ln(pva)) in row 9 are insignificantly different from zero.*

The implicit control group in the above equation is the rest of the world. A preferred alternative is the set of AGOA recipients that are not eligible to export using third country fabric. To isolate the marginal impact of the third country fabric provision on fabric-content, we include additional interactions of ln(*pva*) and ln(*pf*) on dummy variables for all AGOA countries (*DAg*) over the full period and over the 2001-04 period. Estimates of this relationship are presented in column 2 (using all countries) and column 3 (using only emerging countries).[54]

[54] The full specification is given as

R1: $\ln p^{*}_{ict} = \alpha_{ic} + \delta_1 \ln pf_{ft} + \delta_2 \ln pva_{ct}$

R2: $+ \delta_{1b}(Dldc \times \ln pf_{ft}) + \delta_{1c}(D01 \times Dldc \times \ln pf_{ft}) + \delta_{2b}(Dldc \times \ln pva_{ct}) + \delta_{2c}(D01 \times Dldc \times \ln pva_{ct})$

R3: $+ \theta_{1b}(DAg \times \ln pf_{ct}) + \theta_{1c}(D01 \times DAg \times \ln pf_{ct}) + \theta_{2b}(DAg \times \ln pva_{ct}) + \theta_{2c}(D01 \times DAg \times \ln pva_{ct})$

R4: $+ \delta_3 \ln GDPwork_{ct} + \delta_4 \ln e_{ct} + \delta_5 \ln usppi_{naics,t} + \delta_6 \ln Pcompete_{it} - \delta_7 \ln(1 + tariff_{hs4,ct}) + \lambda_t + \varepsilon_{ict}$

Table 6: Marginal impact of AGOA preferences on fabric-intensity in beneficiary countries

	Country sample	All	All	Emerging
	Control group	ROW	All countries and Other AGOA	Emerging countries and Other AGOA
	column	(1)	(2)	(3)
1. δ_3	ln(GDP/capita), PPP	0.115***	0.112***	0.224***
2. δ_1	ln(pf)	0.271***	0.269***	0.140**
3. δ_{1b}	Dldc x ln(pf)	0.360***	-0.03	0.024
4. δ_{1c}	D01 x Dldc x ln(pf)	-0.128	0.036	0.019
5. θ_{1b}	DAg x ln(pf)		0.394**	0.320*
6. θ_{1c}	D01 x DAg x ln(pf)		-0.166	-0.172
7. δ_2	ln(pva)	0.250***	0.252***	0.251***
8. δ_{2b}	Dldc x ln(pva)	-0.379***	0.172	0.1
9. δ_c	D01 x Dldc x ln(pva)	0.11	-0.041	-0.024
10. θ_{2b}	DAg x ln(pva)		-0.553**	-0.466**
11. θ_{2c}	D01 x DAg x ln(pva)		0.153	0.16
12	ln(e)	-0.550***	-0.549***	-0.392***
13	ln(Pcompete)	0.037***	0.037***	0.070***
14	ln(US ppi)	0.131	0.129	0.230**
15	ln(1+t)	-0.627***	-0.645***	-0.724***
16	N	255231	255231	140242
	Fixed effects	country/product year	country/product year	Country/product Year

Notes: all estimates include year fixed effects and country by product fixed effects. Estimates are robust to heteroskedasticity. * p<.1; ** p<.05; *** p<.01

The coefficients on the LDC interaction terms in rows 3-4 and 8-9 are now interpreted as the *marginal* impact on fabric intensity in LDC special rule countries relative to the rest of AGOA. Our theory predicts that the third country fabric rule raises the fabric-content of apparel relative to other AGOA countries, so we expect a positive sign for δ_{1c} and a negative sign for δ_{2c} (row 4 & row 9).

We still find no increases in the fabric content of apparel exports by lesser-developed AGOA countries relative to other AGOA countries from 2001 to 2004. None of the marginal effects for LDC Special Rule countries are significant. In addition, the estimates suggest no change in the fabric content of apparel exports for AGOA countries as a group. This is revealed by the insignificant coefficients on (*D01* x *DAg* x *ln*(*pf*)) in row 6 and (*D01* x *DAg* x *ln*(*pva*)) in row 11 in columns 2 and 3.

Overall, the results suggest that the preferences under AGOA had very little impact on the fabric content of apparel exports to the US by recipient countries. Lesser-developed beneficiaries (and other AGOA countries) therefore predominantly expanded output of existing apparel varieties (which as shown earlier are low value-

added and fabric-intensive) rather than shifting towards more fabric-intensive varieties.

The LDC special rule AGOA countries were already specialized in fabric intensive products prior to receiving AGOA preferences.. The impact of AGOA was to make production of these products more attractive and they responded by increasing exports of these products. But these countries did not respond with large volumes of new exports of products using more fabric. Apparently, there was only limited scope or ability to apply expensive fabrics and low value added products and thus the expansion was overwhelmingly in the intensive margin. This outcome suggests either that the firms in Lesotho were unable to take advantage of profit opportunities or that such opportunities were not available.

End of MFA

We complete the price-based analysis by looking at responses to the end of the MFA. Theory predicts that firms in previously quota restricted countries respond by downgrading the quality of their apparel exports. Evidence in support of this is found by Brambilla et al. (2007) and Harrigan and Barrows (2009). Our earlier diagrammatic analysis in Figure 8 and Figure 9 also revealed declines in average prices from 2005.

Simple price regressions corroborate this finding. Below we present a regression of log import unit values (fob) for apparel products on log GDP per capita, log tariffs, log transport costs (per unit quantity), log distance, log area and dummy variables for being landlocked or bordering the US. Also included is a dummy variable for quota constrained countries (top 30 taken from Brambilla et al. (2007)) and an interaction between this dummy variable and one for the post 2005 period (Dquota x D0508).

ln(P) = 2.4	+ 0.28 ln(GDP/capita)	– 0.12 Dquota	– 0.23 (Dquota x D0508)	– 0.14 ln(dist)		
se	*(207.3)*	*(39.3)*	*(52.3)*	*(55.0)*		
	-0.35 ln(1+t)	+ 0.40 ln(transport)	+ 0.17 Dlandlock	+ 0.02 ln(area)	– 0.08 Dborder	
se	*(14.1)*	*(286.8)*	*(34.7)*	*(47.5)*	*(12.0)*	

Adj R2 = 0.72, Obs = 435 593, Period: 1996-2008, Fixed effects: product by year. Estimates are robust to heteroskedasticity.

Of particular interest to us, is the coefficient on the interaction variable for quota constrained countries in the post 2005 period.[55] This coefficient reveals that the average unit value of apparel exports in quota constrained countries declined by 23 log points after 2005. In other estimates, we find an average decline for China of 33 log points. Quota constrained countries therefore responded to the end of the MFA by reducing the quality of their apparel exports by shifting towards lower priced varieties and products.

What is not well known, however, is the impact of the ending of the MFA on the fabric composition of apparel exports to the US. Our theory predicts a rise in the fabric-content of exports by previously quota constrained countries and also an increased use of cheaper fabric. We have no clear predictions on the marginal impact on fabric-content in LDC Special Rule countries in response to the ending of the MFA. However, we expect the fabric-content of apparel in all AGOA countries to fall relative to the previously quota constrained countries.

To test the theory, we estimate a final variant of our price equation. We focus on the period from 2001 to 2008 to eliminate possible biases arising from differences in the fabric-content of AGOA countries before and after the implementation of AGOA. Because we are primarily interested in a comparison with quota restricted countries, we also restrict the sample to AGOA recipients and the 30 countries that faced the most binding quotas. The estimated equation is:

$$\begin{aligned}\ln p^{*}_{ict} = {} & \alpha_{ic} + \delta_1 \ln pf_{ft} + \delta_{1c}(Dldc \times \ln pf_{ft}) + \delta_{1d}(D05 \times Dldc \times \ln pf_{ft}) \\ & + \delta_2 \ln pva_{ct} + \delta_{2c}(Dldc \times \ln pva_{ct}) + \delta_{2d}(D05 \times Dldc \times \ln pva_{ct}) \\ & + \delta_3 \ln GDPwork_{ct} + \delta_4 \ln e_{ct} + \delta_5 \ln usppi_{naics,t} + \delta_6 \ln Pcompete_{it} \\ & - \delta_7 \ln(1 + tariff_{hs4,ct}) + \lambda_t + \varepsilon_{ict}\end{aligned}$$

where the main difference with earlier estimates is that the log input prices for third-country fabric eligible countries are interacted with a dummy variable *D05* for the post 2005 period. The coefficients (δ_{1d}) and (δ_{2d}) capture the marginal impact on

[55] The remaining results show unit values are higher for wealthier countries and rise in response to higher unit transport costs, and whether the country is landlocked, large or does not share a border with the US. These coefficients are consistent with the Alchian-Allen effect whereby firms upgrade product quality in response to higher unit transport costs. Tariffs lower unit values which is also consistent with the theoretical extension and estimates of the Alchian-Allen effect by Hummels and Skiba (2004).

fabric-intensity in AGOA LDC Special Rule countries in response to the ending of the MFA (relative to the 2001 through 2004 period and relative to the quota restricted group). The expectation is that the ending of the MFA altered the relative incentive in the LDC Special Rule countries away from producing fabric-intensive products (i.e. $\delta_{1d} < 0$ and $\delta_{2d} > 0$).

Table 7 presents various results based on this price equation. The shaded rows are most relevant and reflect the marginal impact on fabric-content from the ending of the MFA. When comparing LDC AGOA countries with quota restricted countries, we find no change in the fabric-content of LDC AGOA exports in response to the ending of the MFA (see column 1 coefficients). The interaction terms for the post-2005 period are insignificant.

Table 7: Marginal impact of the ending of the MFA on fabric-intensity in Apparel eligible AGOA beneficiaries

		Other AGOA & Quota restricted group	Other AGOA & Quota restricted group	
Control group	Quota restricted group	Other AGOA & Quota restricted group	Above average tariffs	Below average tariffs
	1	2	3	4
ln(GDP/capita), PPP	-0.333***	-0.329***	-0.473***	-0.758***
ln(pf)	0.326***	0.316***	0.624***	0.290***
Dapparel x ln(pf)	0.211***	0.333**	0.149	0.461**
D05 x Dldc x ln(pf)	-0.075	0.327**	0.629**	0.046
DAg x ln(pf)		-0.128	0.232	0.13
D05 x DAg x ln(pf)		-0.399***	-0.653**	-0.281
ln(pva)	0.273***	0.274***	0.290***	0.214***
Dldc x ln(pva)	-0.300***	-0.805***	-0.142	-0.922***
D05 x Dldc x ln(pva)	0.073	-0.321**	-0.639***	-0.046
DAg x ln(pva)		0.516***	-0.143	0.345
D05 x DAg x ln(pva)		0.391***	0.654***	0.279*
Dquotacntry x ln(pf)				
D05 x Dquotacntry x ln(pf)				
Dquotacntry x ln(pva)				
D05 x Dquotacntry x ln(pva)				
ln(e)	-0.557***	-0.547***	-1.051***	-0.847***
ln(Pcompete)	0.070***	0.070***	0.041**	0.043***
ln(US ppi)	0.286***	0.273***	0.225	0.226*
ln(1+t)	-0.424***	-0.355***	-0.424***	-0.407**
N	175364	177747	37125	84888
F	130	119	47.4	66.5

Notes: The sample in all estimates consists of all AGOA recipients and the top 20 quota restricted countries obtained from Brambilla et al. (2007).

However, once we look at the marginal impact relative to the rest of AGOA in columns 2 to 4, we find evidence of significant increases in the fabric-content of LDC

AGOA after 2005 (see the significant coefficients on the post-2005 interactions with LDC AGOA countries in rows 4 & 9 of column 2). What is driving these relative increases are significant *decline* in the fabric-content of apparel exports from other AGOA countries relative to the quota constrained control group. This is shown by the significant and oppositely signed coefficients for the AGOA interactions in row 6 & 11 of column 2.

Further, as the final two columns of Table 7 reveal, the post 2005 effects are concentrated in products with above average MFN tariff protection. None of the post-MFA interactions are significant at the 5 percent level when the sample of products is restricted to those with below average tariff preferences.

In conclusion, the MFA induced AGOA countries to specialize in low value added, high fabric-content apparel products. AGOA preferences and particularly the third-country fabric provision were expected, according to our theory, to compound this specialization in low value-added, fabric-intensive varieties and products. We do not find evidence of significant changes in the fabric-content of apparel exports in response to the AGOA preferences. Rather, the AGOA preferences led to substantial increases in existing varieties (and new products – see later).

The dependence of these exports on the tariff preferences and quota restrictions in competing countries made AGOA recipients very vulnerable to the ending of the MFA. The elimination of quotas (quotas were re-introduced on Chinese exports in later 2005) induced previously quota restricted countries to downgrade product quality and increase exports of those products and varieties that AGOA countries were specialized in. The impact on export volumes by AGOA countries was considerable. However, the effect on fabric-content of AGOA exports appears to be concentrated in AGOA countries such as South Africa and Mauritius that were not eligible to export using third country fabric. *The third-country fabric provision helped insulate lesser-developed beneficiaries from the ending of the MFA.*

We now turn to alternative tests of our hypotheses based on changes in the composition of US imports from AGOA countries. The focus here is on whether across-product changes in the composition of US imports from LDC AGOA countries are consistent with our theoretical predictions.

Import responses to AGOA preferences

So far we have focused on changes in the quality and fabric-content of exports in recipients of AGOA preferences. Import volumes also responded, as is well documented by Collier & Venables (2007), Frazer and Van Biesebroeck (2010) and Portugal-Perez (2008). In this section we introduce a few extensions to their work to complement our focus on product quality. We are particularly interested in identifying whether across-product shifts in the composition of exports are consistent with our theoretical priors. Our expectation is that AGOA preferences stimulated US imports from beneficiary countries, with relatively high growth in imports of fabric-intensive and low value-added products. In addition, we expect import growth to be positively correlated with tariff preference margins.

Empirical method

The empirical method we follow is the difference in differences (DD) approach used by Frazer and Van Biesebroeck (2010).[56] The specification of our most simple (triple) difference in differences equation is

$$\begin{aligned}\ln IMP_{cpt} = {} & \beta_1 D2001 * Dldc_c * DAg_c \\ & + \beta_2 D2001 * DAg_c \\ & + cntry/prod_{cp} + prod/year_{pt} + \varepsilon_{cpt}\end{aligned}$$

where:

IMP is US imports of apparel product *p* from country *c* in period *t*

Dldc = 1 if country is eligible to export apparel products using third-country fabric under AGOA (zero otherwise)

DAg = 1 if for all AGOA countries (zero otherwise)

D2001 is dummy for the post 2001 period for all products & countries

Cntry/prod are country by product fixed effects

Prod/year are product by year fixed effects.

As shown by Frazer and Van Biesenbroeck (2010) this specification is a less restrictive version of a standard difference in differences specification, but has the

[56] Frazer and Van Biesebroeck (2010) also include other products including those eligible under the Generalized System of Preferences (GSP). They therefore control for variations between time periods, between products and between countries, i.e. they implement a triple difference in difference specification.

advantage that it allows for country by product heterogeneity in the base-level of imports.[57]

Implicitly, other AGOA countries act as the control group for LDC Special Rule countries, while the rest of the world serves as the control group for other AGOA countries. [58] Other AGOA includes South Africa and Mauritius who are eligible to export apparel products under AGOA preferences (but not to use third country fabric).[59] Intuitively, the specification compares the change in imports in apparel eligible countries pre and post the implementation of AGOA, with the change in imports in other AGOA countries. The coefficient on the triple interaction term β_1, therefore, measures the surge in apparel imports in response to the third-country fabric provision.

An important consideration relating to the basic specification is that not all countries became eligible for the third-country fabric provision at the same time. We therefore replace *D2001* with time- and country-varying dummy variables DAg_start_{ct} and $DApp\_start_{ct}$ which equal 1 for each country from the time they became eligible for AGOA preferences and LDC Special Rule preferences, respectively.

The key insight from our theory is that in addition to stimulating overall exports, AGOA preferences raise the relative incentive to export fabric-intensive products. *We therefore expect relatively strong export growth in products characterized by low value addition and high fabric content.* To identify the cross-product growth effects, we interact the double and triple interaction terms with dummy variables (DF_{jp}) representing different classes of products defined according fabric-intensity as follows:

$$\begin{aligned}\ln IMP_{cpt} = & \sum_j (\beta_{1j} DApp\_start_{ct} * DApp_c * DAg_c * DF_{jp}) \\ & + \sum_j (\beta_{2j} DAg\_start_{ct} * DAg_c * DF_{jp}) \\ & + cntry/prod_{cp} + prod/year_{pt} + \varepsilon_{cpt}\end{aligned}$$

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[57] The common DD specification is given by

$\ln IMP_{cpt} = (\alpha_1 + \beta_1 D2001) * Dldc_c * DAg_c + (\alpha_2 + \beta_2 D2001) * DAg_c + \alpha_3 D2001 + \varepsilon_{cpt}$.

Note the double interaction *D*2001**Dapp* is not included as this is equivalent to the triple interaction term.

[58] Apparel exports by countries prior to becoming eligible for the apparel preferences also act as controls.

[59] Mauritius was temporarily granted the third-country fabric derogation from October 2004-September 2005 under the Miscellaneous Tariff Bill of 2004 (known as AGOA III).

Theory predicts that we find larger coefficients on categories representing low value-added and high fabric-content products.

Two proxies for the average fabric-intensity of products are used in the analysis. The first indicator is the share of fabric in costs at the 4-digit HS level. The fabric shares are derived from our price equation estimates presented earlier. The second proxy used is the share of value added in sales. Unfortunately, this data are not available at the detailed 10-digit HS level. We therefore use US value added shares for 21 NAICS 6-digit categories. Our expectations are that AGOA beneficiary exports growth is concentrated in relatively low value added sectors.

We apply these various estimates using US apparel import values at the HS 10-digit level from 1996 to 2008. The estimates are broken up into two periods: 1996-2004 and 1996-2008. The latter period covers the ending of the MFA and a comparison with the shorter period therefore allows us to identify the MFA specific impact. The dependent variable is the logarithmic transformation of import values. We follow Frazer and Van Biesebroeck (2010) and add a constant of value 1 dollar to all import values to address the problem of zero imports.[60]

Aggregate impact

We first ascertain whether our estimates of the impact of AGOA apparel preferences on US imports from beneficiary countries corroborate those found by other studies. Table 8 presents various estimates the impact of AGOA on import values. The estimates reveal three effects on US import values and product range: (a) significant increases in response to the preferences, (b) an adverse impact from the ending of the MFA, and (c) a positive relationship with tariff preferences.

[60] This increases the mean of exports by one dollar, but does not affect the variance. See Frazer and Van Biesebroeck (2010) who show that the positive impact is insensitive to different choices of constant value, although the size of the impact is influenced. One concern with applying OLS to this estimate is that the transformed dependent variable is left-censored at zero. Portugal-Perez (2008) therefore uses a tobit model in his estimates. This was not feasible in our case given the large number of fixed effects included. A further issue is that our estimates reflect the net outcome of the decision by beneficiary countries to export new products (the extensive margin) and to increase exports of existing products (intensive margin).

Table 8: Impact of AGOA apparel preferences on US import volumes from beneficiary countries

Dependent variable	ln IMP		ln IMP		Import dummy	
Sample	All		Positive value product lines		All	
Years	1996-08	1996-04	1996-08	1996-04	1996-08	1996-04
	1	2	3	4	5	6
Marginal impact LDC preference relative to Other AGOA	13.9%	16.8%	351.3%	281.5%	0.9%	1.2%
Marginal impact Other AGOA relative to non-AGOA	-9.2%	-8.4%	-11.8%	17.6%	-1.1%	-0.9%
Regression coefficients						
$DApp\_start_{ct}*DApp_c*DAg_c$	13.0%	15.5%	150.7%	133.9%	0.9%	1.2%
	(34.44)	(26.20)	(29.62)	(19.66)	(21.80)	(20.18)
$DAg\_start_{ct}*DAg_c$	-9.7%	-8.8%	-12.5%	16.2%	-1.1%	-0.9%
	(31.66)	(23.61)	(2.98)	(3.46)	(33.62)	(21.56)
N	4490620	3114506	1057151	732050	4490620	3114506
Dummy variables	product/year country/product		product/year country/product		product/year country/product	

Notes: Robust t-statistics presented in parentheses. Estimates are robust to heteroskedasticity. South Africa, which is not eligible for the third country fabric provision, is excluded from the apparel eligible group. Mauritius is also excluded, as it was only eligible for the LDC special rule from October 2004 – September 2005 and more recently from November 2008. Percentage change is calculated as exp(coefficient)-1.

The first set of columns, indicate a marginal impact from the third-country fabric special rule (relative to non-beneficiary AGOA countries) of 16.8 percent over the period 2001 through 2004 and 13.9 percent if the post-MFA period is included. Also shown are significant declines in imports from the rest of AGOA relative to the rest of the world: -9.2 percent from 2001-04 and -8.4 percent from 2001-08.[61] The implication is that the ending of quotas under the MFA eliminated 17 percent of the gains to lesser-developed AGOA countries relative to the rest of AGOA.

The estimated size of the impact is substantially smaller than other studies where the estimates range from 38.4 percent (Frazer and Van Biesebroeck 2010, table 2) to 303 percent for the top 7 beneficiaries (Portugal-Perez 2008). One reason is that our data are at a far more disaggregated level than their studies, which in the case of Frazer and Van Biesebroeck (2010) is based on HS 6-digit level data. The implication is that our sample includes far more zero value product lines which reduce the estimated impact as for most product lines there is zero change in imports. When we delete country specific product lines in which no trade occurs (as in Portugal-Perez

[61] The marginal impact of the third country fabric provision relative to non-AGOA countries is therefore substantially lower at 8.4 percent from 2001-04 and 4.7 percent for the full period (calculated as sum of coefficients on interaction terms). The end of the MFA therefore eliminated 40 percent of the gains for lesser-developed AGOA countries relative to the rest of the world.

(2008)) substantially larger impacts are estimated (columns 3 & 4): over 380 percent over the full period and 280 percent over the shorter period. [62]

The final two columns of the table also reveal marginal increases in the range of products exported (the extensive margin) by lesser-developed AGOA countries in response to the preferences, and a slight decline in the marginal impact after 2005. The dependent variable in these estimates is a country- and time-specific categorical variable equal to 1 if the product is exported in that year. The coefficients are therefore interpreted as the marginal change in probability that a beneficiary country exports the product relative to the control group.[63] The third-country fabric provision initially raised the probability of exporting each product line by 1.2 percent relative to the rest of AGOA, but this declined to 0.9 percent after the end of the MFA.

Finally, estimates presented in Table 9 reveal the size of the tariff preference has a significant impact on the marginal import response. For example, US imports from lesser-developed AGOA countries grew by 78 percent (relative to rest of AGOA) in products facing a 78 percent tariff preference, compared to 1 percent in products facing tariff preferences of less than 10 percent. This is also revealed in Figure 11 which shows a shift in the composition of AGOA LDC exports to products with high preference margins (as measured using 1998-2001 MFN tariff rates).

[62] Differences in the sample of countries also influence the results. Estimates where high-income countries are excluded produce slightly smaller marginal impacts of the third-country fabric rule and larger declines in the rest of AGOA relative to other emerging economies.

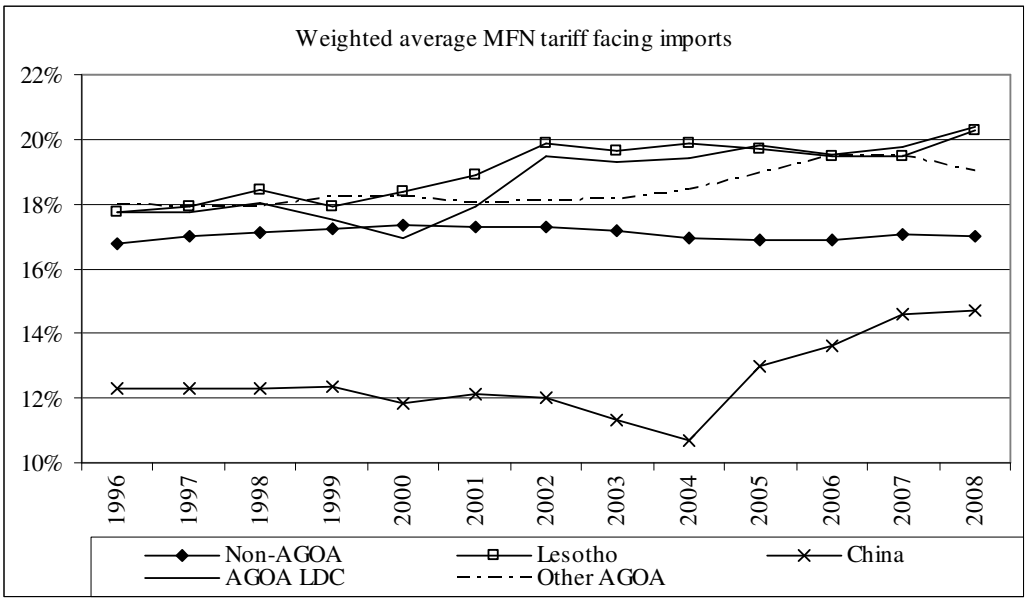
[63] The one limitation of using OLS to estimate this specification is that the coefficients are not restricted to lie within the interval (0,1). However, as shown by Frazer and Van Biesebroeck (2010), this is unlikely to be a problem as the probability estimates are likely to be small.

Table 9: Marginal impact on imports from AGOA countries by initial MFN tariff rate

Dependent variable	ln IMP		Import dummy	
Years	1996-08	1996-04	1996-08	1996-04
Marginal impact LDC preference relative to Other AGOA				
t < 10%	1.0%	1.0%	-0.1%	0.0%
	(2.35)	(1.57)	(1.87)	(0.49)
10% ≤ t < 17%	10.7%	13.5%	0.6%	0.9%
	(15.50)	(12.10)	(8.75)	(8.83)
17% ≤ t < 18%	23.2%	22.5%	0.9%	0.8%
	(4.80)	(3.00)	(2.11)	(1.29)
18% ≤ t < 20%	54.8%	68.2%	3.1%	4.2%
	(14.82)	(11.02)	(11.20)	(9.61)
20% ≤ t	59.4%	78.1%	3.7%	4.7%
	(35.70)	(26.10)	(29.42)	(23.11)
Marginal impact Other AGOA relative to non-AGOA				
t < 10%	-8.7%	-6.9%	-1.1%	-0.8%
	(23.64)	(15.05)	(25.16)	(14.02)
10% ≤ t < 17%	-9.1%	-7.6%	-1.1%	-0.8%
	(17.17)	(11.87)	(18.19)	(11.02)
17% ≤ t < 18%	-7.3%	-8.8%	-0.7%	-0.5%
	(2.22)	(2.15)	(1.98)	(1.13)
18% ≤ t < 20%	-13.3%	-14.5%	-1.4%	-1.4%
	(6.68)	(6.16)	(6.45)	(5.53)
20% ≤ t	-10.5%	-13.1%	-1.2%	-1.3%
	(11.85)	(12.29)	(12.31)	(11.00)
N	4490620	3114506	4490620	3114506
	product/year		product/year	
Dummy variables	country/product		country/product	

Notes: Robust t-statistics presented in parentheses. Estimates are robust to heteroskedasticity. South Africa, which is not eligible for the third country fabric provision, is excluded from the apparel eligible group. Mauritius is also excluded, as it was only eligible for the LDC special rule from October 2004 – September 2005 and more recently from November 2008. Percentage change is calculated as exp(coefficient)-1. The tariff cut-off points are set so that total US apparel imports are equally distributed across categories.

Figure 11: Import weighted pre-2001 MFN tariff rates



Notes: Calculated as $\sum_i m_{ict} tar_{98-00}$ where m_{ict} is the share imports of product i in country c in year t and tar is the average MFN rate from 1998-2000.

Across product changes in fabric-intensity of US imports

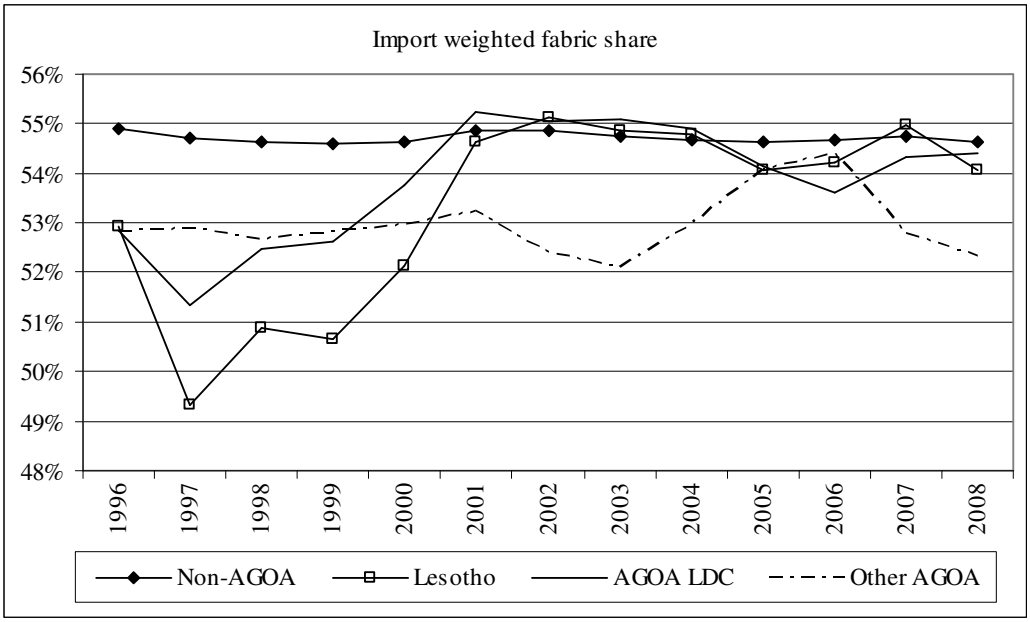
We now look for evidence of shifts in the composition of US imports that are consistent with our theoretical predictions. Figure 12 presents trends in the import weighted average fabric share for LDC AGOA countries, the rest of the world, China and Lesotho. The import weighted averages are calculated using product specific fabric shares derived from estimates of equation XX at the HS 10-digit level.[64]

The trends are broadly consistent with our theoretical predictions. Imports from lesser-developed AGOA countries grew relatively strongly in fabric-intensive products from 2000 to 2003, but then declined slightly from 2006 after the removal of quotas under the MFA. Much of this trend reflects changes in the composition of clothing imports from Lesotho, although a shift out of fabric-intensive products occurs earlier from 2004. Imports from non-LDC AGOA countries also shifted towards fabric-intensive products up to 2003, but a dramatic reversal took place subsequently. These trends are consistent with our expectations that the third-country

[64] The price equations include country specific effects. HS 4-digit or 3-digit estimates are used when the derived fabric share falls outside of the range (0,1).

fabric provision induced lesser-developed AGOA beneficiaries to export relatively fabric-intensive apparel products. Further, we also see evidence of China re-orientating exports towards those products in which AGOA beneficiaries are specialized in.

Figure 12: Import weighted average fabric share, based on 4-digit HS fabric share estimates



Notes: Based on 4-digit fabric intensity estimates. Fabric coefficients less than or equal to zero and greater than or equal to 1 are replaced with 3-digit estimates.
File: tqvist_fabricP_27May10.xls

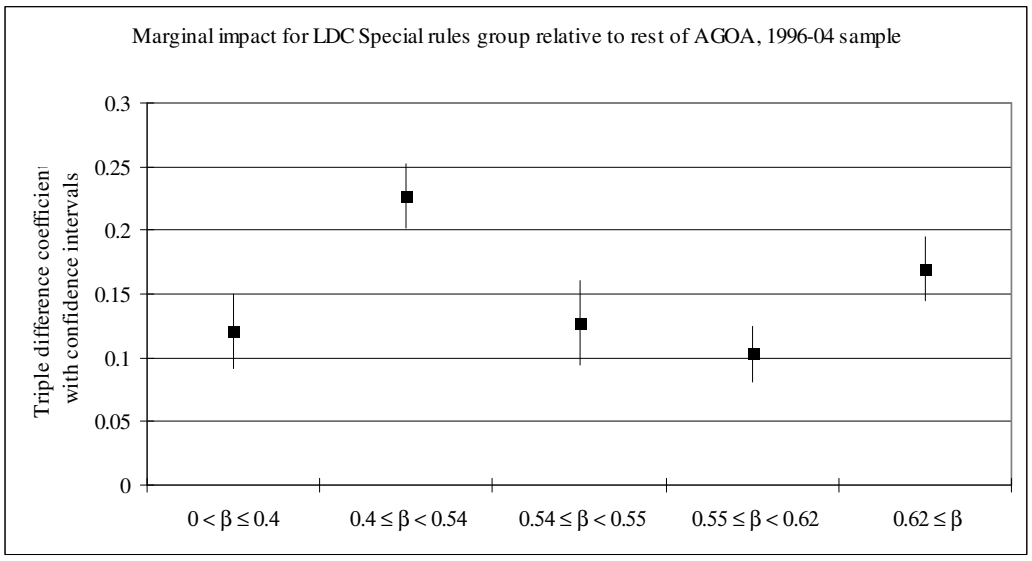
These trends are corroborated by the difference in differences estimates. Figure 13 presents the marginal impact (with confidence intervals) from 2001-04 of AGOA preferences on imports from lesser-developed recipients. The first diagram presents the unconditional import response, while the second presents the import response conditional on tariff preferences.[65] Import growth is concentrated in the middle of the fabric-intensity range with the lowest growth in the least fabric intensive product category (FC1), followed by the most fabric-intensive category

[65] We include categories for tariff preferences as presented in Table 9.

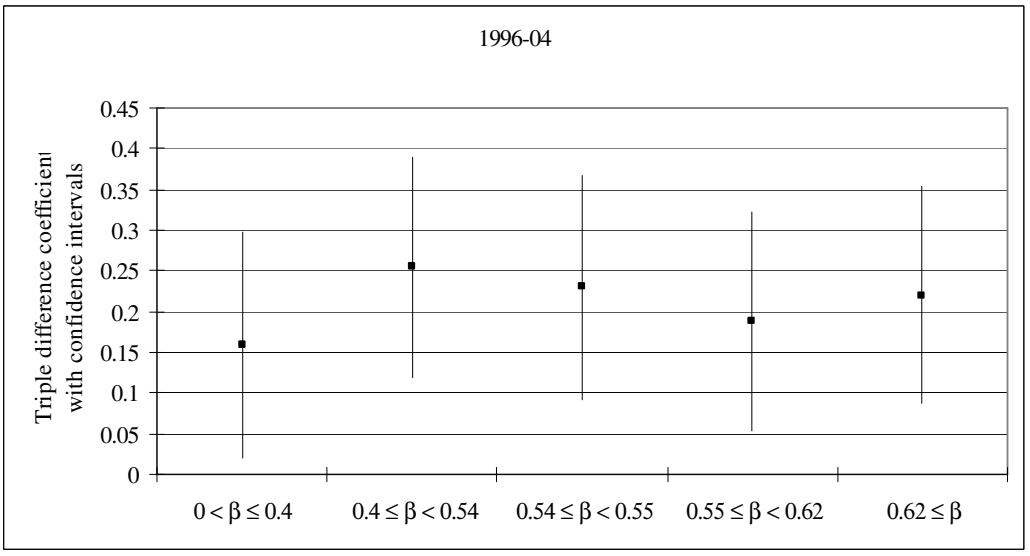
(FC5). The estimates are less precise once we include the initial tariff effect, but the relative impacts across fabric category remain the same.[66]

Figure 13: Marginal impact of third-country fabric provision on U.S. imports by fabric-intensity category, 2001-04.

(a) Not conditional on import response to tariff preference



(b) Conditional on import response to tariff preference



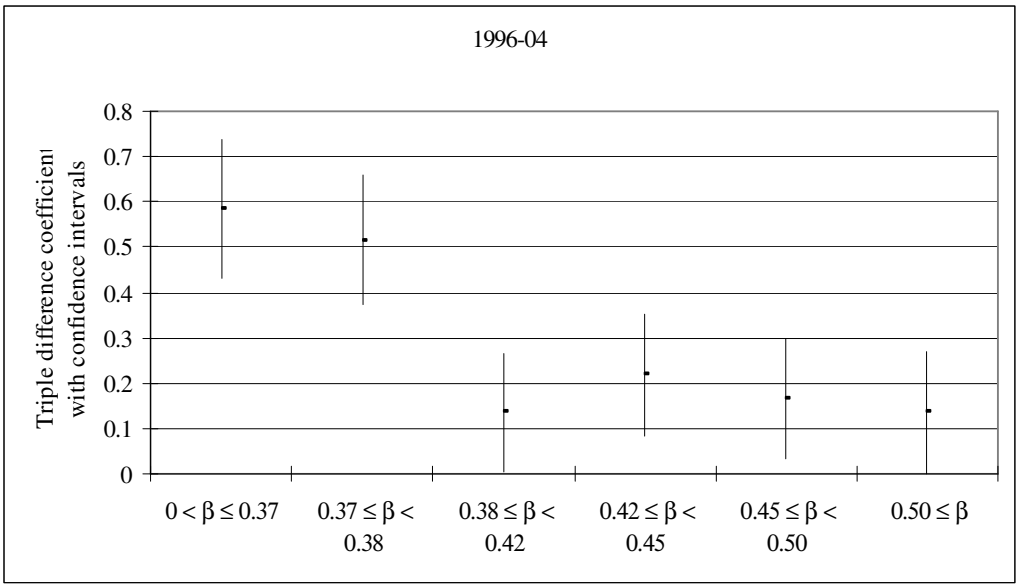
Notes: The cut-off points are set so that total US apparel imports are equally distributed across categories.

[66] Imports from other AGOA countries fell relative to the rest of the world with the strongest relative declines occurring in the more fabric-intensive sectors.

We also assess shifts in the composition of apparel exports according to the share of value added in costs. Figure 14 presents the marginal impact on imports arising from the third-country fabric provision according to value added category. All coefficients are conditional on the import response to initial tariffs. There is a clear delineation of impacts. Lesser-developed countries experienced import growth in excess of 66 percent in low value-added apparel products (value added share less than 38 percent) and only 15-25 percent growth in higher value-added products compared to other AGOA recipients.[67]

In sum, across-product shifts in the composition of US imports from lesser-developed AGOA beneficiaries are consistent with our theoretical hypotheses that the third country-fabric provision induces beneficiary firms to export fabric-intensive and low-value added apparel.

Figure 14: Marginal impact of third-country fabric provision on U.S. imports by value added category, conditional on import response to tariff preference



Notes: The cut-off points are set so that total US apparel imports are equally distributed across categories.

[67] One explanation is that imports of low value-added products declined sharply in other AGOA countries relative to the rest of the world, but we still find a bias towards low value-added products when we compare import growth from lesser-developed AGOA countries with the rest of the world.

Conclusions

Lesotho and other LDBCs enjoyed rapid growth in their clothing exports to the US as a result of the third-country fabric provision of AGOA. Although adversely impacted by the expiration of the MFA and the recession in the US, the clothing industries of these least developed African countries have clearly benefited from the provisions. But these economies have not enjoyed the more dynamic upgrading and spill-over benefits that might have been hoped for. Most of the export growth has come in the products that these countries were already producing. Success in the US clothing market has also not translated into success in other clothing markets or in success in exporting other labor-intensive products The LDBCs have generally remained specialized in a small number of garment categories that are particularly favored by the preferences. These typically embody low-value added in sewing and are relatively intensive in fabric.. Although the AGOA program has operated for a decade, it is unlikely that most of the industry in these poor Sub-Saharan could survive without the special rule.

This experience provides important lessons. Trade preferences do have three major advantages. First, they can offer powerful inducements to beneficiary exporters that are financed through foregone tariff revenues by developed countries rather than taxpayers in developing countries. Second, by providing a form of infant industry protection in export rather than domestic markets, they ensure that products have to meet the requirements of consumers in advanced economies. And third, since they are externally imposed, they do not give rise to domestic rent-seeking.

The positive response to AGOAs special rule highlights the importance of providing exporters with access to inputs at world prices. Requiring exporters to use expensive inputs can seriously impede their competitiveness. This is clearly seen in the contrast between Lesotho's prowess in the United States where it is allowed to use fabrics that are priced at world prices, with its weak performance in the EU and SACU where it is not. The positive response to AGOA highlights the restrictive nature of other rules of origin that have been imposed on least developed country exports. Allowing LDBCs to use imported fabrics provided powerful effective subsidies for clothing exports. This served to compensate producers in poor countries

for the lower productivity of domestic workers and other institutional and infrastructural deficiencies.

The fact that the program has operated smoothly without problems relating to trade deflection demonstrates the scope for improving the restrictive rules that continue to limit the benefits to poor countries from programs such as the EBA program of the European Union. Such improvements would create more realistic possibilities that the least developed countries could participation in global production chains. It would be particularly welcome given the problems faced by these countries as a result of the expiration of the MFA.

In the Doha Round, it is recognized that lower MFN tariffs will result in preference erosion. But typically studies have suggested that the effects would not be large. [68]However, if the models that are used to estimate the impact of erosion fail to take the third-country fabric provision into account they could seriously underestimated the impact on the effective protection provided to the LDBC AGOA recipients.

The experience also shows, however, that trade preferences are not a panacea. The outcomes associated with the special rule conform to those suggested by theory. The special rule distorts decisions on value-addition and fabric use in opposite directions, both of which are undesirable. On the one hand, the incentives are most powerful in lower quality products that require less value-addition. This may limit the dynamic benefits that are hoped for from these preferences by discouraging skills development and other forms of quality upgrading. On the other hand it encourages the use of more expensive fabrics. This makes it less likely that there will be backward linkages into domestic textile industries that are still at rudimentary stages of development.

Preferences are thus an opportunity but not a substitute for more comprehensive industrial strategies that involve complementary domestic policies to improve private and governmental capabilities. This does not mean that these preferences are unimportant, but suggests they are unlikely to be sufficient. In addition problems arise when most of the entrepreneurs taking advantage of the

[68] For estimates of the impact of preference erosion see IMF (2003), Olarreaga and Ozden (2005), Hoekman, B. and Prowse, S.(2005). Grynberg, R., and Silva, S. (2004)

preferences are foreign, with many other crucial parts of the value chain being provided thousands of miles away.

The experience analyzed in this paper is a case study of the links between trade and growth -- a topic that has been the subject of considerable empirical investigation. This example highlights the obvious, but often ignored consideration, that both trade and growth are quintessentially endogenous variables rather than policy instruments and suggests that the reasons for trade are likely to be important in the impact on growth. Even if on average trade and growth are associated, and even if on average trade may cause growth, the widely used proposition that trade leads to growth should not be used as an unconditional forecast. The precise reasons for trade and the other domestic conditions and policies that are associated with it, are likely to play key roles in the growth impact. In the case of Lesotho and other AGOA countries utilizing preferences may lead to more trade but are not a substitute for the more difficult challenges of developing more comprehensive development strategies. In sum, the slogan of “trade not aid” can be misleading. Trade preferences may be help create the conditions for growth, but they are not necessarily sufficient

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Table A1: Regressions by 4-digit HS level

Hs4 code	Description	Coefficients ln(GDP worker)	ln(pf)	ln(pva)	ln(e)	ln(Pcomp ete)	ln(US ppi)	ln(1+t)	N	F	r2	Hypothesis tests (p-value) HOD 1	$\delta_1+\delta_2=\beta_2$	Erate= tariff
6101	men's or boys' overcoats etc, knit or crochet	-0.186	0.329**	0.217***	-0.660***	0.062	-0.439	0.873**	2890	7.19	0.024	0.169	0.072	0.003
6102	women's or girls' overcoats etc, knit or crochet	-0.530***	0.199	0.420***	-0.704***	0.107**	-0.546	0.047	3833	14.3	0.035	0.719	0.048	0.397
6103	men's or boys' suits, ensembles etc, knit or croch	-0.282***	0.358***	0.326***	-0.672***	0.062**	0.774***	-1.265***	8136	17.6	0.024	0.122	0.714	0.002
6104	women's or girls' suits, ensemb etc, knit or croch	-0.319***	0.406***	0.358***	-0.812***	0.070***	1.444***	-0.244	24243	76.2	0.030	0.001	0.011	0.772
6105	men's or boys' shirts, knitted or crocheted	0.071	0.469***	0.331***	-0.678***	0.150**	0.649*	-0.293	4272	14.8	0.035	0.118	0.001	0.928
6106	women's or girls' blouses & shirts, knit or croch	-0.149	0.231**	0.255***	-0.555***	0.161***	0.539	-0.557*	5332	15.1	0.027	0.651	0.114	0.731
6107	men's or boys' underpants, pjs, etc, knit or croch	-0.384	0.752**	-0.13	-1.377***	0.262**	0.274	1.029	2321	3.96	0.018	0.902	0.008	0.658
6108	women's or girls' slips, pjs, etc, knit or crochet	-0.454***	0.439***	0.370***	-0.912***	0.064*	0.238	-1.884***	10262	33.7	0.033	0.794	0.003	0.000
6109	t-shirts, singlets, tank tops etc, knit or crochet	-0.105*	0.225***	0.273***	-0.632***	0.023	0.780***	0.042	14877	39.1	0.025	0.067	0.000	0.027
6110	sweaters, pullovers, vests etc, knit or crocheted	-0.179***	0.574***	0.298***	-0.819***	0.056***	0.406**	-0.423***	29316	98.4	0.031	0.041	0.003	0.100
6111	babies' garments & accessories, knit or crocheted	-0.299	0.241	0.381***	-0.829***	0.229***	1.329**	1.139	5254	20.8	0.048	0.054	0.101	0.082
6112	track suits, ski-suits & swimwear, knit or crochet	-0.442***	0.736***	0.286***	-1.101***	0.079**	1.894***	-0.367	6478	24.4	0.033	0.004	0.067	0.239
6113	garments, knit etc, coated etc rubber, plastic etc	0.037	1.015***	-0.034	-1.180***	0.076	0.989	4.128*	2653	8.76	0.030	0.162	0.036	0.099
6114	garments nesoi, knitted or crocheted	-0.375***	0.647***	0.279***	-1.028***	0.016	-0.181	-0.43	9940	33.5	0.031	0.484	0.004	0.114
6115	pantyhose, socks & other hosiery, knit or crochet	-0.348**	0.151*	0.609***	-0.718***	0.047	1.775**	-0.564	5535	18	0.030	0.036	0.379	0.728
6116	gloves, mittens and mitts, knitted or crocheted	-0.677***	0.689***	0.441***	-1.108***	-0.054	0.725	-1.525***	5314	21.5	0.032	0.132	0.779	0.005
6117	made-up clothing access nesoi. parts etc. knit etc	-0.561***	0.367**	0.392***	-0.678***	0.096***	3.312***	-0.866	5824	15.7	0.023	0.000	0.304	0.435
6201	men's or boys' overcoats, cloaks etc, not knit etc	0.032	0.343***	0.351***	-0.638***	0.068**	-0.403	-0.225	12265	34.8	0.026	0.089	0.050	0.556
6202	women's or girls' overcoats etc, not knit or croch	-0.043	0.410***	0.354***	-0.788***	0.013	-0.509	-0.438**	14450	57	0.035	0.294	0.183	0.296
6203	men's or boys' suits, ensembles etc, not knit etc	0.057	0.238***	0.358***	-0.573***	0.100***	0.698***	-0.579***	22945	72.3	0.030	0.026	0.199	0.398
6204	women's or girls' suits, ensemb etc, not knit etc	-0.009	0.447***	0.368***	-0.822***	0.044***	0.797***	-0.504***	50694	245	0.044	0.019	0.510	0.043
6205	men's or boys' shirts, not knitted or crocheted	0.113	0.368***	0.319***	-0.641***	-0.035	0.924***	-0.718***	6467	19.2	0.029	0.087	0.168	0.198
6206	women's or girls' blouses, shirts etc not knit etc	0.028	0.453***	0.205***	-0.704***	0.052*	0.989***	-0.687***	7965	38.3	0.042	0.037	0.085	0.119
6207	men's or boys' undershirts etc, not knit or croch	-0.068	0.352	0.263	-0.987***	-0.071	0.628	-2.315	2337	4.27	0.024	0.893	0.105	0.249
6208	women's or girls' slips etc, not knit or crochet	-0.095	0.306***	0.195***	-0.577***	0.116***	-0.463	-1.424***	7748	15.5	0.021	0.064	0.077	0.001
6209	babies' garments & accessories, not knit or croch	-0.358**	0.602***	0.238**	-1.258***	-0.084	0.923	-0.923	3786	19.9	0.054	0.329	0.002	0.118
6210	garments, of felt etc, or fabric impregnated etc	-0.299***	0.429***	0.149**	-0.577***	-0.052	-0.093	-0.137	7067	5.03	0.007	0.315	0.978	0.561
6211	track suits, ski-suits & swimwear, not knit etc	-0.046	0.386***	0.289***	-0.674***	0.079***	0.582***	0.555**	28191	54.1	0.018	0.144	0.937	0.001
6212	bras, girdles, garters etc., knitted etc or not	-0.117	0.509***	0.390***	-0.854***	-0.049	1.165*	-1.159**	5872	21.8	0.032	0.101	0.382	0.072

6213	handkerchiefs	-0.758**	0.147	0.053	-1.064***	-0.044	11.178***	1.781	1049	4.38	0.046	0.001	0.001	0.428
6214	shawls, scarves, mufflers, mantillas, veils etc.	-0.097	-0.04	0.208*	-0.099	0.156*	2.429	-0.055	3625	2.66	0.007	0.246	0.448	0.162
6215	ties, bow ties & cravats, not knitted or crocheted	-0.817***	-0.157	0.733***	-0.472***	0.126**	0.823	0.318	1974	6.86	0.031	0.519	0.247	0.284
6216	gloves, mittens and mitts, not knit or crocheted	-0.027	0.897***	0.232*	-0.945***	-0.033	-1.059	-0.737	2991	3.62	0.013	0.305	0.110	0.366
6217	made-up clothing access nesoi, garment etc parts nesoi	-0.571**	0.102	0.323**	-0.627***	-0.006	8.474***	-0.019	4782	9.05	0.020	0.000	0.034	0.652
6406	parts of footwear: insoles etc: gaitors etc, parts	-1.000**	-0.699	0.713**	-0.06	-0.012	4.351**	1.158	691	2.79	0.045	0.045	0.900	0.558
6501	hat forms/bodies, hoods, plateaux & manchons of felt	0.359	1.500*	-0.629	-0.838	-0.054	1.703	-2.434	381	0.885	0.027	0.401	0.893	0.528
6502	hat shapes, plaited or assembled strips any material	-0.243	0.656	-0.117	-0.75	0.136*	3.266*	-0.79	671	3.31	0.043	0.074	0.382	0.657
6503	felt hats & other felt headgear from heading 6501	0.498	2.189	-0.012	-2.288**	-0.046	1.255	-81.49***	243	9.51	0.347	0.535	0.657	0.000
6504	hats & other headgear,plaitd/assmbld strips any material	-0.099	0.126	0.214	-0.595**	0.228**	0.754	-0.658*	1653	4.05	0.019	0.683	0.062	0.557
6505	hats & headgear, knit etc, lace, etc in pc, hr net	-0.300***	0.545***	0.278***	-0.817***	0.151***	0.554**	-1.285**	9802	24.2	0.027	0.044	0.867	0.039

Note: Year fixed effects are not included as the fabric costs do not vary across products for some of the HS 4-digit groups. Estimates are robust to heteroscekasticity.

Overall, the coefficients are broadly consistent with expectations. In most sectors the coefficient on fabric prices is positive and ranges from 0.23 to just over 1. Similarly, the coefficients on value added prices and the exchange rate are mostly of the correct sign. The estimates for Headgear (HS 64) and Footwear (HS 65) products are poor, but is likely that the fabric costs indices do not adequately reflect the inputs used in the production of these products. For example, HS 6406 covers Parts of Footwear; Removable In-Soles, Heel Cushions And Similar Articles; Gaiters, Leggings etc. HS65 covers headgear products often comprising of felt, strips of any material, lace, etc. These products also make up a very small proportion of AGAO country exports. Most estimates fail to reject the homogeneity and symmetric pass-through (both the tariffs and exchange rate & exchange rate and production costs) hypotheses. Each hypothesis is rejected at most 12 times (out of 40).

Table A2: Marginal impact on import volumes and probability of exporting a product by Fabric Share category, conditional on import response to tariff liberalization

Dependent variable	ln IMP		Import dummy	
Sample	All		All	
Years	1996-08	1996-04	1996-08	1996-04
Marginal impact LDC preference relative to Other AGOA				
$0 < \beta \leq 0.4$	21.0%	17.2%	0.9%	0.5%
	(4.15)	(2.23)	(1.89)	(0.76)
$0.4 \leq \beta < 0.54$	27.4%	29.0%	1.2%	1.3%
	(5.44)	(3.69)	(2.66)	(1.92)
$0.54 \leq \beta < 0.55$	25.7%	25.9%	1.0%	1.1%
	(5.07)	(3.28)	(2.24)	(1.60)
$0.55 \leq \beta < 0.62$	21.8%	20.7%	0.8%	0.7%
	(4.53)	(2.78)	(1.88)	(1.05)
$0.62 \leq \beta$	24.4%	24.6%	1.0%	1.0%
	(5.00)	(3.24)	(2.25)	(1.52)
Marginal impact Other AGOA relative to non-AGOA				
$0 < \beta \leq 0.4$	-11.5%	-15.1%	-1.2%	-1.5%
	-(3.41)	-(6.16)	-(3.11)	-(5.60)
$0.4 \leq \beta < 0.54$	-11.2%	-15.5%	-1.1%	-1.5%
	-(3.40)	-(6.44)	-(2.93)	-(5.77)
$0.54 \leq \beta < 0.55$	-4.4%	-9.9%	-0.4%	-0.8%
	-(1.28)	-(3.82)	-(1.11)	-(3.04)
$0.55 \leq \beta < 0.62$	-6.6%	-13.5%	-0.7%	-1.3%
	-(1.98)	-(5.58)	-(1.82)	-(5.22)
$0.62 \leq \beta$	-7.1%	-14.2%	-0.7%	-1.3%
	-(2.14)	-(5.71)	-(1.84)	-(4.93)
N	4490620	3114506	4490620	3114506
Dummy variables	product/year		product/year	
	country/product		country/product	

Note: Estimates conditional on import response to initial tariffs. Robust t-statistics presented in parentheses. Estimates are robust to heteroskedasticity. Percentage change is calculated as exp(coefficient)-1.

Table A4: Marginal impact on import volumes and probability of exporting a product by Value Added category

Dependent variable	ln IMP		Import dummy	
Sample	All		All	
Years	1996-08	1996-04	1996-08	1996-04
Marginal impact LDC preference relative to Other AGOA				
$0 < \beta \leq 0.37$	62.7%	79.3%	3.1%	4.1%
	(9.92)	(7.52)	(6.38)	(5.47)
$0.37 \leq \beta < 0.38$	50.1%	67.5%	2.4%	3.6%
	(8.73)	(7.08)	(5.11)	(5.01)
$0.38 \leq \beta < 0.42$	15.3%	14.6%	0.4%	0.4%
	(3.30)	(2.04)	(0.97)	(0.56)
$0.42 \leq \beta < 0.45$	29.4%	24.5%	1.5%	1.1%
	(5.77)	(3.16)	(3.27)	(1.69)
$0.45 \leq \beta < 0.50$	20.7%	18.2%	0.8%	0.6%
	(4.27)	(2.44)	(1.86)	(0.86)
$0.50 \leq \beta$	16.8%	14.6%	0.7%	0.4%
	(3.46)	(1.97)	(1.45)	(0.67)
Marginal impact Other AGOA relative to non-AGOA				
$0 < \beta \leq 0.37$	-8.4%	-18.9%	-0.8%	-1.9%
	-(2.32)	-(6.43)	-(2.10)	-(5.87)
$0.37 \leq \beta < 0.38$	-15.2%	-22.6%	-1.4%	-2.1%
	-(4.55)	-(8.47)	-(3.63)	-(6.99)
$0.38 \leq \beta < 0.42$	-6.2%	-12.2%	-0.6%	-1.2%
	-(1.87)	-(5.17)	-(1.74)	-(4.65)
$0.42 \leq \beta < 0.45$	-6.7%	-15.3%	-0.7%	-1.5%
	-(1.97)	-(6.30)	-(1.97)	-(5.89)
$0.45 \leq \beta < 0.50$	-8.5%	-16.2%	-0.8%	-1.5%
	-(2.55)	-(6.81)	-(2.15)	-(5.80)
$0.50 \leq \beta$	-9.6%	-15.4%	-1.0%	-1.6%
	-(2.87)	-(6.46)	-(2.65)	-(6.09)
N	4490620	3114506	4490620	3114506
Dummy variables	product/year country/product		product/year country/product	