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**Invited paper prepared for presentation at the
International Association of Agricultural Economists Conference,
Gold Coast, Australia, August 12-18, 2006**

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**The Doha Development Round and Africa:
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Preliminary version

Abstract:

Erosion of trade preferences currently being enjoyed by LDCs and some developing countries remain an important area in the on-going trade negotiations. The different positions regarding the preference erosion question besides being informed by political economy considerations are also founded on empirical results of this particular question. But does the methodology used for the empirical analysis matter? In this paper, the importance of preference erosion question due to MFN liberalisation on agriculture is analyzed. Drawing from the potential complementary strengths in triangulation, the paper uses both partial and general equilibrium analyses. The paper shows that the ranking of preference erosion as an issue of policy concern is influenced by the empirical methodology adopted. However, irrespective of the rank, the paper concludes that preference erosion is an important issue not only in terms of welfare, but also as it has impacts on incomes for preference receiving countries.

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I. Introduction

The market access question has remained one of the critical areas in the multilateral trade talks. This is a question that has not only been relevant to the trade in agricultural goods but also, the trade in industrial goods, especially with respect to the role latter can play in the diversification of African countries' economies. However, the liberalisation of agricultural trade in the on-going Doha Round negotiations has attained something akin to the pole position. This prominence is not in any way by accident but is a reflection of the significance liberalising market access for agricultural exports from developing countries, especially African countries is. Enhancement of market access in agricultural trade, particularly in the developed countries' markets is supposed to bolster exports and economic activity in developing countries.

This liberalisation however is expected to favour countries whose exports are currently impeded by multilateral protection through tariffs and non-tariff measures. At the same time, the liberalisation is expected to be a challenge to the Least Developed Countries (LDCs) and some developing countries, especially those from Africa, that currently enjoy preferential market access through different schemes set up by the developed countries. Therefore, for Africa, a key issue has been whether MFN liberalisation under the Doha Round will adversely affect their market access to developed countries, through erosion of the preference margins that they currently enjoy. The question of preference erosion has almost attained a deal-breaker status in the current negotiations. For the African countries, preference erosion from any multilateral liberalisation needs to be treated not just as a market access issue, but a development issue.

The link of the preferences to the development dimensions of the trade negotiations has been a key factor in the incorporation of the preference erosion question to the aid-for-trade discussions. Yet for the non-preference receiving developing countries, especially those from Latin America and some parts of Asia, either the preferences are extended to them, or they will not support any agreement that continue to provide asymmetrical preferences. They are a market access issue from their point of view and there is no justification whatsoever for their continuation as development support to the LDCs and some of the developing countries especially those from Africa. Even as the developing countries from Africa and Latin America continue to take different positions on the treatment of preferences in the

negotiations, for the developed countries, compensation for preference erosion can only be contemplated if the magnitude of this erosion is appropriately measured.

As discussed in Section II of this paper, several studies have been carried out, using different methodologies to address the question of preferences in different contexts, ranging from their relevance to the implication of multilateral liberalisation to the existing schemes. In deed, in the context of the on-going negotiations, two key questions have come out clearly. First, do preferences matter to those countries receiving them? And second, what is the magnitude of preference erosion that is likely to result from global trade liberalisation? The answers to these two questions have been addressed in several studies. Yet, review of existing literature presents no single study that sought to answer the two questions, while at the same time using different methodologies. That the political significance of the preference erosion question is dictated upon by the methodology used is not in doubt. Thus, it would be useful using the triangulation framework to address the question of preferences in a unified way in order to seek consensus and consistency in the conclusions and recommendations with regard to the preference erosion question. And that is the task that this paper has set upon itself, to use the triangulation framework to see whether a consistent result on the relevance of the preference erosion question can be obtained.

In the paper, we provide an evaluation of the current trade preferences granted to African countries and of their potential erosion due to MFN liberalisation on agriculture. Drawing from the potential complementary strengths in triangulation, the paper uses both partial and general equilibrium analyses. The paper shows the importance of taking account of preferences in trade liberalisation scenarios using the two methodologies. In particular, it aims to assess the effects of Doha Round MFN liberalisation on trade flows and macroeconomic variables. The focus of the paper on agriculture trade liberalisation does not mean that preference erosion is not important for the industrial goods trade, but is more informed by the availability of a well-tested partial equilibrium model that is used for agriculture trade policy analysis.

The paper is organized as follows. Section II provides a summary of the studies that have been carried out on the preference erosion question in the context of trade liberalisation. That all the studies have used one particular methodology to answer this question comes out clearly in this review. Section III briefly describes the modeling frameworks and

methodologies employed in order to capture the triangulation element of the study. In particular, two different general equilibrium models are highlighted to compare the results obtained from the two models, before comparing them with the partial equilibrium model. In Section IV, the aggregation of the database and the scenarios are described. In order to be able to apportion the differences in the results to the modeling frameworks, it was important that the regional and sectoral aggregations for the general equilibrium models are similar. Section V discusses the results of the simulations while Section VI concludes.

II. Literature review

In the empirical literature, there are several ways in which preferential schemes have been evaluated. Some papers provide purely descriptive measures of the effectiveness of preferences, based on utility and utilisation rates (e.g. UNCTAD, 2003), others are based on econometric techniques which attempt to analyse their impact on trade volumes and aggregate welfare. For example, Romalis (2003) reports a growth dividend over a period of fifteen years of 10 percent for the average African country resulting due to preferential market access.² Haveman and Shatz (2003) estimate an expansion of LDC export volumes by as much as US\$7.6 billion if duty-free access is granted *simultaneously* by the EU, Japan and the United States. Cline (2004) also reports a substantial increase in export volumes due to the Lome/Cotonou Agreements, but pointedly his SSA dummy is negative, implying that the SSA countries have not taken advantage of preferential access in the same way as other beneficiary countries. Other things being equal, preferential regime membership has boosted real export growth by 7.2 percent annually for Caribbean Basin Initiative (CBI) countries and 8.8 percent for Lomé countries. But he also suggests that the model confirms the poor performance of SSA (despite preferential market access), and indicates that “an SSA country typically had a 10.7 percent lower real export annually than would otherwise be expected” (Cline, 2004:97).

Simulation techniques have also been employed to examine the impact of multilateral trade reforms on preference-receiving countries. Some of these studies adopt a partial equilibrium approach while others are based on a general equilibrium framework. For example, IMF (2003) used a partial equilibrium model to examine the impact of a 40 per cent cut in tariffs

² These results should however be treated with some caution. Romalis’s model could be criticized on the grounds that it is under-specified, using as it does only a measure of the value of preferences and a variable representing the structural characteristics of exports to explain GDP growth.

by the QUAD on LDCs. They found that, due to preference erosion, the reform would result in a loss equivalent to about 1.7 percent of total exports. Using a partial equilibrium framework and data for middle-income countries, Alexandraki and Lankes (2004) evaluated the effect of a 40 per cent cut in aggregate preference margins received by beneficiary countries. They conclude that it would result in a loss of between 0.5 and 1.2 percent of total exports of the middle-income countries considered. In a related study, Limao and Olarreaga (2005) undertake a partial equilibrium analysis of the welfare costs of switching from a unilateral preference to an import subsidy scheme. They found that the three preference granting countries considered (US, EU and Japan) would gain US\$2,934 million. Furthermore, the 49 LDCs would gain US\$520 million.

Table 1: Impact of Preference Erosion

Study	Preference Receiving Countries	Preference Granting Countries	Type of Reform and Framework	Remarks and Results
Limao and Olarreaga (2005)	LDCs	US, EU and Japan	Considers cost of replacing unilateral preferences by a fixed import subsidy. Used a partial equilibrium framework.	Switching from unilateral preferences to an import subsidy scheme produces an annual welfare gain of US\$2,934 for the US, EU and Japan. It also produces welfare gain of US\$520 million and US\$900 million for LDCs and the rest of the world respectively.
IMF (2003)	LDCs	Quad	40% cut in tariffs. Used a partial equilibrium framework.	Focuses on trade effects. Finds that reform will result in a loss of about 1.7 percent of total LDC exports. In value terms the loss of exports is US\$530 million.
Alexandraki and Lankes (2004)	Middle-income	Quad	40% cut in preference margin. Used a partial equilibrium framework.	The objective of the study is to identify middle-income countries that are potentially vulnerable to export losses from preference erosion. Finds that the impact of preference erosion is between 0.5 and 1.2 percent of total exports. Study suggests that vulnerable countries are small island states dependent on sugar, bananas and textiles.
Lippoldt and Kowalski (2005)	Developing countries	Quad and Australia	50% linear reduction in ad-valorem equivalent measure of protection	The study finds that certain economies are at risk of experiencing negative welfare effects from preference erosion (Tanzania, Uganda, Mozambique, etc). However,

				the impact tends to be relatively modest. For example, for African countries the change in per capita welfare is less than 0.3%.
Francois, Hoekman and Manchin (2005)	African LDCs	EU and OECD	Full MFN liberalization. Used a general equilibrium framework.	Finds that the real income loss to African LDCs from liberalization by the EU is US\$458 million. For liberalization by the OECD the figure is US\$110 million.

General equilibrium studies into the costs of preference erosion per se are relatively few and far between (for a recent review of these, see Hoekman, Martin and Primo Braga, 2006), essentially because until quite recently preferential margins were not included in the GTAP database as well as other key databases used for analyses of the impact of global trade reform. That said, in recent years several authors have provided estimates of the welfare effect of multilateral trade liberalization resulting from preference erosion using CGE models. For example, Francois, Hoekman and Manchin (2005) examined the scope for preference erosion resulting from full elimination of European Union (EU) and OECD tariffs. Their results suggest that trade liberalization by the EU would lead to income losses of around \$460 million for African LDCs.³ They argue that if preference erosion is viewed in the broader context of potential tariff reduction by all OECD, not just EU members, the magnitude of the total losses is reduced to \$110 million. They explain that this is in part because the EU has been the most aggressive in using preferences as a tool for development assistance. Thus the gains associated with non-EU MFN tariff reductions could partially offset losses due to the erosion of EU preferences. In a related study, Lippoldt and Kowalski (2005) examined the welfare consequences of preference erosion resulting from a 50 percent linear cut in the ad-valorem equivalent measure of protection. They show that such multilateral trade reform would lead to modest welfare losses for some non-OECD countries, most of which are in Sub-Saharan Africa.

³ Francois, Hoekman and Manchin also recalculate the effects of preference erosion taking into account the costs of compliance (due to rules of origin and other administrative costs), estimated at around 4 percent of the value of the goods traded. This reduces the value of preferences, and implies losses of only \$342 million, instead of \$460 million, as per the baseline unadjusted estimate.

A key finding of the results from CGE models is that the estimated welfare effects associated with preference erosion is relatively small. This is due in part to the fact that CGE models assume that domestic goods are differentiated from imported goods and so are imperfect substitutes. This assumption, which follows from Armington (1969), implies that exporters of goods receiving preferences will not face stiff competition as a result of liberalization and so reduces the potential welfare losses that could arise from preference erosion.

III. Modelling Framework and Methodology

To examine the consequences of agricultural trade liberalization for African economies, we use three well-known models of trade policy analyses that take account of trade preferences: the Global Trade Analysis Project (GTAP) model; the MIRAGE model; and the Agricultural Trade Policy Simulation Model (ATPSM). The first two are computable general equilibrium models while the third is a partial equilibrium methodology and so it would be interesting to compare and contrast the results from these different but complementary models.

The GTAP model was developed by the Center for Global Trade Analysis at Purdue University in the United States. The standard GTAP model used in our analysis and its key features are described in Hertel (1997). It is a static multi-country and multi-sector general equilibrium model which assumes perfect competition as well as full employment of factors. Since we are focusing on the role of preferences, we use version 6 of the model, which includes trade preferences. The MIRAGE model was developed by CEPII and has been widely used to analyse agricultural and multilateral trade issues. For a full description of the standard MIRAGE model see Bchir, Decreux, Guérin and Jean (2002). To make the results of the MIRAGE model as comparable as possible to those of GTAP, we use a static version of the MIRAGE model that also assumes perfect competition as well as full employment of factors of production. The ATPSM is a deterministic, static, partial equilibrium model developed by UNCTAD and FAO. It is multi-country, multi-commodity, model that takes account of the distribution of quota rents as well as differences between bound and applied tariffs. A full description of the model can be found in Vanzetti and Graham (2002).

IV. Aggregation and Scenarios

Since the focus of our study is Africa and agricultural trade liberalization, the 87 GTAP regions in version 6 of the database were aggregated into nine regions namely, Sub-Saharan

Africa (SSA), North Africa, USA, EU25, Japan, Rest of the World Developed (ROWD), China, India, and Rest of the Developing World (ROW). The composition of these groups and their mapping to the GTAP 6 sectors are presented in Table 2.

Table 2: Regional Aggregation

Group	GTAP Region
USA	United States
EU25	Austria, Belgium, Denmark, Finland, France, Germany, United Kingdom, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, Cyprus, Czech Republic, Hungary, Malta, Poland, Slovakia, Slovenia, Estonia, Latvia, Lithuania
Japan	Japan
Rest of the World Developed (ROWD)	Australia, New Zealand, Canada
North Africa	Tunisia, Morocco, Rest of North Africa
Sub-Saharan Africa (SSA)	South Africa, Botswana, Malawi, Mozambique, Tanzania, Zambia, Zimbabwe, Rest of SADC, Rest of South African Customs Union, Madagascar, Uganda, Rest of Sub Saharan Africa.
China	China
India	India
Rest of the Developing World (ROW)	Rest of Oceania, Hong Kong, Korea, Taiwan, Rest of East Asia, Singapore, Vietnam, Rest of Southeast Asia, Bangladesh, Sri Lanka, Rest of South Asia, Mexico, Rest of North America, Colombia, Peru, Venezuela, Rest of Andean Pact, Rest of FTAA, Rest of Europe, Albania, Bulgaria, Croatia, Romania, Russian Federation, Rest of Former Soviet Union, Turkey, Rest of Middle East, Indonesia, Malaysia, Philippines, Thailand, Argentina, Brazil, Chile, Uruguay, Rest of South America, Central America.

Turning to the sectors, the 57 GTAP sectors in version 6 were aggregated into 18 sectors in our analysis. Eleven of the eighteen sectors deal with agricultural goods. This sectoral aggregation allows us to focus on the commodities and sectors of interest to African countries in the negotiations. Table 3 contains the exact composition of the sectors used in our analysis as well as their relation to the GTAP 6 regions and sectors.

Table 3: Sectoral aggregation

Sector	GTAP Category
Cereals	Paddy rice, wheat, cereal grains nec, crops nec
Veg_fruit	Vegetables, fruits, nuts
Oil_seeds	Oil seeds
Sugar	Sugar cane, sugar beet, sugar

Cot_bev	Plant-based fibers, beverages and tobacco products
Meat	Cattle, sheep, goats, horses, animal products nec
Dairy	Raw milk, dairy products
Wol	Wool, silk-worm cocoons
Frs	Forestry
Fsh	Fishing
Res_nat	Coal, oil, gas, minerals nec
Agro_ind	Vegetable oils and fat, processed rice, food products nec
Tex_vet	Textiles, wearing apparel
Heavy Industry	Motor vehicles and parts, transport equipment nec, electronic equipment, machinery and equipment nec.
Medium Industry	Petroleum, coal products; Chemical, rubber, plastic prods; Mineral products nec; Ferrous metals; Metals nec; Metal products; Manufactures nec.
Light Industry	Leather products; Wood products; Paper products, publishing.
Services	Electricity; gas manufacture, distribution; water; construction; communication; financial services nec; insurance; business services nec; recreation and other services; pubAdmin/defence/health/educat; dwellings.
Transport	Trade; transport nec; sea transport; air transport.

As indicated earlier, the focus of our study is on agricultural trade liberalization. However, within this sector, we also focus on the market access pillar. This means that the liberalization experiments performed will not involve the domestic support and export competition pillars of the agricultural negotiations. In the simulations, we consider three trade policy scenarios. Scenario 0 is the full liberalization scenario in which all tariff barriers to agricultural trade for all products and all regions are eliminated. Although this scenario is a good benchmark for comparison of the results of the different models, it is not a realistic scenario, because it is unlikely to happen in the current Doha Round negotiations. Consequently, we also consider two scenarios designed to reflect the range of proposals that are being considered in the modalities phase of the Doha negotiations. Scenario 1 involves deep cuts for developed countries and minor cuts for developing countries. It is a version of the proposal contained in the “draft possible modalities for agriculture” issued by the Chair of the Committee on Agriculture (Special Session) on 22 June 2006. It is interesting because it involves aggressive cuts in trade barriers by developed countries but contains elements for Special and Differential Treatment for developing countries. Scenario 2 is basically the G20 proposal and is less ambitious than the cuts in scenarios 0 and 1. More details on the scenarios are provided below.

Scenario 0: This scenario is considered as a benchmark as it implements a full liberalisation for the entire product and all the regions.

Scenario 1: This scenario considers the deepest cuts for developed countries and conservative cuts for developing countries that are 1/3 of those for developed countries as suggested by the ACP countries. It is an ambitious liberalization scenario for developed countries both in terms of thresholds and depth of liberalization.

Tariff band (%)	Cuts by developed countries	Cuts by developing countries	LDC
0-20%	65%	20%	No liberalization
20-40%	75%	25%	
40-60%	85%	28%	
Above 60%	90%	30%	

Scenario 2: This scenario which is less ambitious than the previous two, captures the G-20 proposal and is therefore interesting given the influence that this group has in the negotiations.

Tariff band (%)	Cuts by developed countries	Cuts by developing countries	LDC
0-20%	20%	15%	No liberalization
20-40%	30%	20%	
40-60%	35%	25%	
Above 60%	42%	30%	

V. Simulation results

In this section, we report results of the key simulation experiments performed. For the general equilibrium models, our focus will be on five key variables: welfare, output, term of trade, import and exports.

For the MIRAGE model, simulation results for the three scenarios considered are presented in Table 4. In the full liberalization scenario (S0), the welfare gain to SSA in the model with preferences is \$357 million. For North Africa the figure is \$3,197 million. However, when preferences are not taken into account the welfare gains are \$1,651 million and \$4,267 million for SSA and North Africa respectively. The key implication of this finding is that

preferences have serious consequences for welfare in recipient countries. The results also suggest that relative to SSA, North Africa has more to gain from agricultural liberalization. This has to do with the fact that countries in North Africa tend to have better infrastructure and also better capacity to take advantage of trading opportunities created in the multilateral trading system. With respect to the terms of trade, full liberalization leads to a deterioration in the terms of trade for both SSA and North Africa. But the deterioration is more pronounced for North Africa in the models with and without preferences.

In terms of output (GDP), the results suggest that full liberalization increases output in both SSA and North Africa but, again, the impact is much higher for North Africa than SSA. For example, in the model with preferences, output increases by 0.72 percent in SSA and by 4.21 percent in North Africa. As for exports and imports, the results are qualitatively similar to those of the other variables. The increase in exports and imports resulting from liberalization is higher in the model without preferences. They are also higher for North Africa.

Looking at the Doha Scenarios (1 and 2) considered, the welfare results suggest that for both SSA and North Africa, the gains are higher without preferences. In addition, unlike SSA, North Africa incurs welfare losses in both scenarios when preferences are taken into account. For example, while SSA derives welfare benefit of \$174 million in Scenario 1, North Africa incurs losses of \$362 million.

Table 4: MIRAGE Results

Variable	<i>Sub Saharan Africa</i>						<i>North Africa</i>					
	With Preferences			Without Preferences			With Preferences			Without Preferences		
Scenarios	S0	S1	S2	S0	S1	S2	S0	S1	S2	S0	S1	S2
Welfare ^a	357	174	315	1651	441	914	3197	-362	-316	4267	371	475
Terms of Trade ^b	-0.48	-0.11	0.15	-0.77	-0.11	0.27	-7.81	-0.71	-0.52	-7.34	-0.41	-0.33
GDP ^b	0.72	0.05	0.07	1.13	0.12	0.19	4.21	-0.13	-0.12	4.68	0.16	0.19
Exports ^b	21.96	0.66	1.03	28.69	1.22	2.32	45.39	-0.6	-0.37	60.09	1.63	1.85
Imports ^b	22.39	0.7	1.09	29.27	1.26	2.43	43.07	-0.5	-0.23	57.02	1.60	1.93

^a US million \$

^b % variation

How do these results compare to those from the GTAP model. Table 5 presents results of the simulations using the GTAP model. The results of the version of the model with preferences suggest that full liberalization of agricultural trade would yield welfare gains of \$542 million

for SSA and a welfare loss of \$62 million for North Africa. When preferences are not taken into account both SSA and North Africa derive gains from full liberalization but the gains are larger for North Africa (\$977 million for SSA and \$2,903 for North Africa).

As in the MIRAGE model, the results from the GTAP simulations suggest that preferences matter. However, for SSA in the full liberalization scenario the difference between the results with and without preferences is larger when we use the MIRAGE model. In terms of output, the result suggests that full liberalization increases output and this result is true for both SSA and North Africa. It is also noticed in the versions of the model with and without preferences. However, as expected the changes are larger in the model without preferences. Interestingly, for SSA, the terms of trade changes associated with full liberalization are positive while they are negative for North Africa. This explains why the welfare changes for North Africa in the model with preferences are negative in this scenario. For exports and imports, in general, the results suggest that liberalization would lead to an increase in these variables and this result holds for both SSA and North Africa. They also hold for versions of the model with and without preferences.

Table 5: GTAP Results

Variable	<i>Sub Saharan Africa</i>						<i>North Africa</i>					
	With Preferences			Without Preferences			With Preferences			Without Preferences		
Scenarios	S0	S1	S2	S0	S1	S2	S0	S1	S2	S0	S1	S2
Welfare ^a	542	418	121	977	538	137	-62	179	82	2903	727	423
Terms of Trade ^b	0.19	0.2	0.03	0.19	0.25	-0.03	-0.86	0.01	-0.12	-0.74	0.1	-0.08
GDP ^b	0.1	0.06	0.03	0.23	0.09	0.05	0.21	0.07	0.07	1.62	0.33	0.23
Exports ^b	2.34	0.65	0.36	4.45	1.01	0.49	6.17	1.13	0.8	6.49	1.16	0.80
Imports ^b	0.5	-0.03	0.19	7.3	5.53	0.52	4.38	0.78	0.54	10.35	5.22	0.82

^a US million \$

^b % variation

Simulation results for the ATPSM model are presented in Table 6 They suggest that full liberalization of agricultural trade would lead to a welfare loss of \$375 million for SSA but would yield welfare gains of \$551 million for North Africa. The welfare loss for SSA arises from the fact that the changes in producer surplus and government revenue resulting from full liberalization are negative in SSA and these dominate the positive changes from consumer surplus. Unlike in SSA, the change in consumer surplus in North Africa is large enough to offset the negative welfare effects from changes in producer surplus and government revenue. When we compare the results from the ATPSM model to those of the

two general equilibrium models, we find that there are significant differences in the welfare results. For example, for SSA the MIRAGE and GTAP models suggest that full liberalization would yield positive welfare gains while the ATPSM model suggests a welfare loss. There are also wide differences in the magnitude of the changes in output between the partial equilibrium and the general equilibrium models considered. For example, for SSA the change in output resulting from full liberalization is 2.87 percent while it is only 0.72 and 0.10 percent respectively for MIRAGE and GTAP.

Table 6: ATPSM Results

Variable	<i>With Preferences</i>	
	Sub Saharan Africa	North Africa
Scenarios	Full liberalisation of Agricultural Product (S0)	Full liberalisation of Agricultural Product (S0)
Change in welfare ^a	-375	551
- Consumer surplus	3438	6046
- Producer surplus	-1199	-4652
- Change in Government Revenue	-2614	-843
GDP ^b	2.87	-15.44

^a US million \$, only in the agricultural sector (no interaction with the NAMA one), Version 3, January 2005

^b % variation

VI. Conclusion

Does the modeling methodology matter to the question of the relevance of preferences within the context of multilateral liberalisation? This is the question that this paper sought to answer by seeking to establish using a triangulation framework whether there are contradictions in the results and recommendations one arrives to in trade liberalisation analysis. Using three different models and a database that takes account of preferences and one that doesn't, it is clear that in terms of magnitudes, modeling framework matters. And to the extent that policy recommendations and ranking in terms of policy importance is determined by the magnitude, then the modeling methodology is critical. And even where one has two different models using the general equilibrium framework, policy ranking in terms of magnitudes is an important issue. This paper has clearly indicated that the use of static CGE and partial equilibrium models lead to different results in terms of magnitudes and could lead to different policy ranking. Thus, different levels of importance can be attributed to the preference erosion issue depending on the framework used. However, the general direction of the changes in the economic impacts is the same irrespective of the modeling framework. Barring the differences in magnitudes and by extension the rank in

terms of importance in the negotiations, it is clearly evident that preferences matter for sub-Saharan Africa.

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