A skeptics view of the AGOA preferences of the USA: A propensity score matching approach

Edgar F. A. Cooke

30. May 2012

A Skeptics view of the *AGOA* preferences of the USA: A propensity score matching approach

Edgar F. A. Cooke*
University of Sussex
Department of Economics
E.F.A.Cooke@sussex.ac.uk
Comments are Welcome

Draft: 30th May 2012

*I am grateful to colleagues for comments received at the Thursday seminar series. As usual all remaining errors are entirely mine.

Abstract

Majority of the *agoa* impact literature have mainly resorted to regression analysis. In this paper, a change towards constructing a counter-factual set of countries is adopted. In doing this, the propensity score matching framework is used in estimating the *average treatment effect on the treated (ATT)* of the *agoa* policy on recipient countries. The results show that countries exporting to the USA did increase their shares of *agoa* exports while reducing their share under the *most favoured nation* tariffs. The exports levels on the other hand, are not significant in most cases. In comparing the shares of exports to the USA to those of the EU and rest of the world, an unambiguous decrease in the share of exports to the rest of the world is observed. However, the shares of exports to the USA and EU in most cases increased. The contribution of the paper is in providing a consistent and robust matching framework to study the *agoa* trade preferences.

1 Introduction

The provision of trade preferences is to provide market access opportunities to developing countries. The USA's provision of *agoa* is expected to lead to an increase in exports from African beneficiary countries to the USA. In addition, it is expected to have a direct and indirect feedback in the economies of the beneficiary countries. The direct effects would include job creation and investment opportunities as new enterprises are created to take advantage of the new export opportunities to the USA. The indirect effects on the other hand, includes other opportunities created—for example a boost in the service industry activities related to exporting. These could well be banking and insurance products for exporters as well as increased tax revenue for the African beneficiaries from the increased exporting activities. These advantages can only be derived if beneficiary governments provide the necessary support and enabling environment to promote businesses taking up the challenge to export to the USA.

In this paper, I seek not only to measure the impact of *agoa* but also, to carefully construct a counter-factual to measure the impact of *agoa* I intend to show that the existing empirical literature on the impact of *agoa* would continue to provide a positive and exaggerated impact due to the counter-factual used within the regression framework in those studies. The departure here, is by constructing a comparable group of counter-factual countries that are similar in several respects to the beneficiary countries to measure this impact.

There exists a considerable number of studies evaluating the impact of *agoa* on the beneficiaries (for example, Collier and Venables, 2007, Condon and Stern, 2011, Frazer and Van Biesebroeck, 2010, Nouve, 2005, Nouve and Staatz, 2003, Seyoum, 2007, Tadesse and Fayissa, 2008, Tadesse et al., 2008). I add to this literature by trying to estimating the impact of *agoa* on beneficiary countries using a novel methodological approach that is becoming popular in the economic literature. Existing studies base their analysis on traditional econometrics (these include, Lederman and Özden, 2007, Nouve, 2005, Seyoum, 2007) while others use the evaluation methodology (for instance, Collier and Venables, 2007, Frazer and Van Biesebroeck, 2010). In this paper, the propensity score matching approach is used in the analysis. The problem in studying the impact is that the counter-factual is not available. Thus matching is a way of constructing a counter-factual to measure the impact of *agoa* on the exports of recipients.

In matching *agoa* countries to other developing countries a vector of variables containing characteristics of both countries are used to make the match. It is assumed that there is independence between the treatment and the controls. Previous studies (for example Collier and Venables, 2007, GAO, 2008, USITC, 2007) point to large increases in the exports of *agoa* beneficiaries to the USA. One could therefore compare the exports to the USA by *agoa* recipients to the counter-factual to test whether there was a significant increase compared to *non–agoa* countries. Nevertheless, the coefficients of both regressions can be compared to observe the size of the changes compared to *non–agoa* recipients.

The main question asked in this paper is *"Whether there has been an observed increase in the exports of agoa recipients to the USA compared to the counter-factual (other non–agoa countries)?"* A related question is, whether exports to the European Union decreased in response to the *agoa* adoption compared to the counter-factual countries. To start us off in answering this question I consider the following objectives:

- To provide appropriate matching and evaluation frameworks for the *agoa* countries exporting to the USA to provide a causal explanation of any increase in exports.
- Match *agoa* countries to other developing countries using identifiable characteristics and features such as economic size, distance to international markets, common colonial heritage, common language, religion, capital/labour intensities and cultural background among others.

The two main hypotheses to be tested in the paper are

- *agoa* countries export less to the USA than other developing countries after controlling for similar characteristics.
- *agoa* exports have displaced apparel and textile exports to the European Union.

The rest of the paper is organised as follows. The next section presents the stylised facts of the export data and a theoretical framework for the subsequent analysis. The third section discusses the data and econometric approach used, followed by a discussion of the results obtained. The final section concludes the paper.

2 Stylised Facts and Theoretical Framework

2.1 Stylised Facts

A few diagrams are presented here to show some of the stylised facts of the data. In the diagrams, several SSA countries had majority of their exports to the USA not receiving the *gsp* preference. Rather a large share of exports to the USA did not claim any preferential treatment and instead received the *most favoured nation (mfn)* (*no programme*) tariffs. After the inception of *agoa*, uptake of the preference has been markedly different—some countries have seen a phenomenal increase in their share of *agoa* out of total exports to the USA. Notably, these shares have varied over the years after 2001. The countries with high shares at particular points in time include Lesotho, Swaziland, Malawi, Madagascar, Nigeria and Kenya—larger than 60% of their exports to the USA in Figures (1, 2 & 3). Figure (1) plots the shares of *agoa* and *no programme* imports by the USA out of total imports for each *agoa* beneficiary on the horizontal and vertical axes respectively. Figure (2) on the other hand, has the *gsp* share on the vertical axis. Countries with high shares of *gsp* exports prior to *agoa* seem to have done well in increasing their share of *agoa* exports. This could well be due to *gsp* products that have

been subsumed under *agoa* preferences. On the contrary, there are a couple of countries that have not seen significant gains in their *agoa* exports to the USA (for example, Ethiopia, Uganda, Tanzania and Rwanda among others). The final graph in this section, figure (3) shows the relationship between the *gsp* and *no programme* import shares.

Figure (1) paints a picture of the gradual decline in *no programme* USA import shares for each *agoa* recipient. The cross-section relationship becomes negative after the inception of *agoa*. The countries gradually push out towards the lower right end of the graphs in figure (1). The relationship with the *gsp* shares is however not that clear. However, the graphs depict an increase in the *agoa* share for a large number of the beneficiaries. Over time *gsp* shares have fallen below 50% for a large majority of beneficiaries. The notable exception is Mauritania in 2008. Malawi and Cape Verde had high *gsp* shares in 1999. By 2002 they no longer had high shares of *gsp*—*agoa* had replaced much of their *gsp* exports. The experience among the beneficiaries has been relatively heterogeneous. Countries with initial high shares of *gsp* exports have ceded much of these shares to *agoa*. On the other hand, countries that exported mostly under the *mfn* regime (*no programme*) have increased their *agoa* shares by reducing the exports under the *mfn* regime. For other countries the increase in their *agoa* share has been a combination of declining *gsp* and *mfn* regime shares.

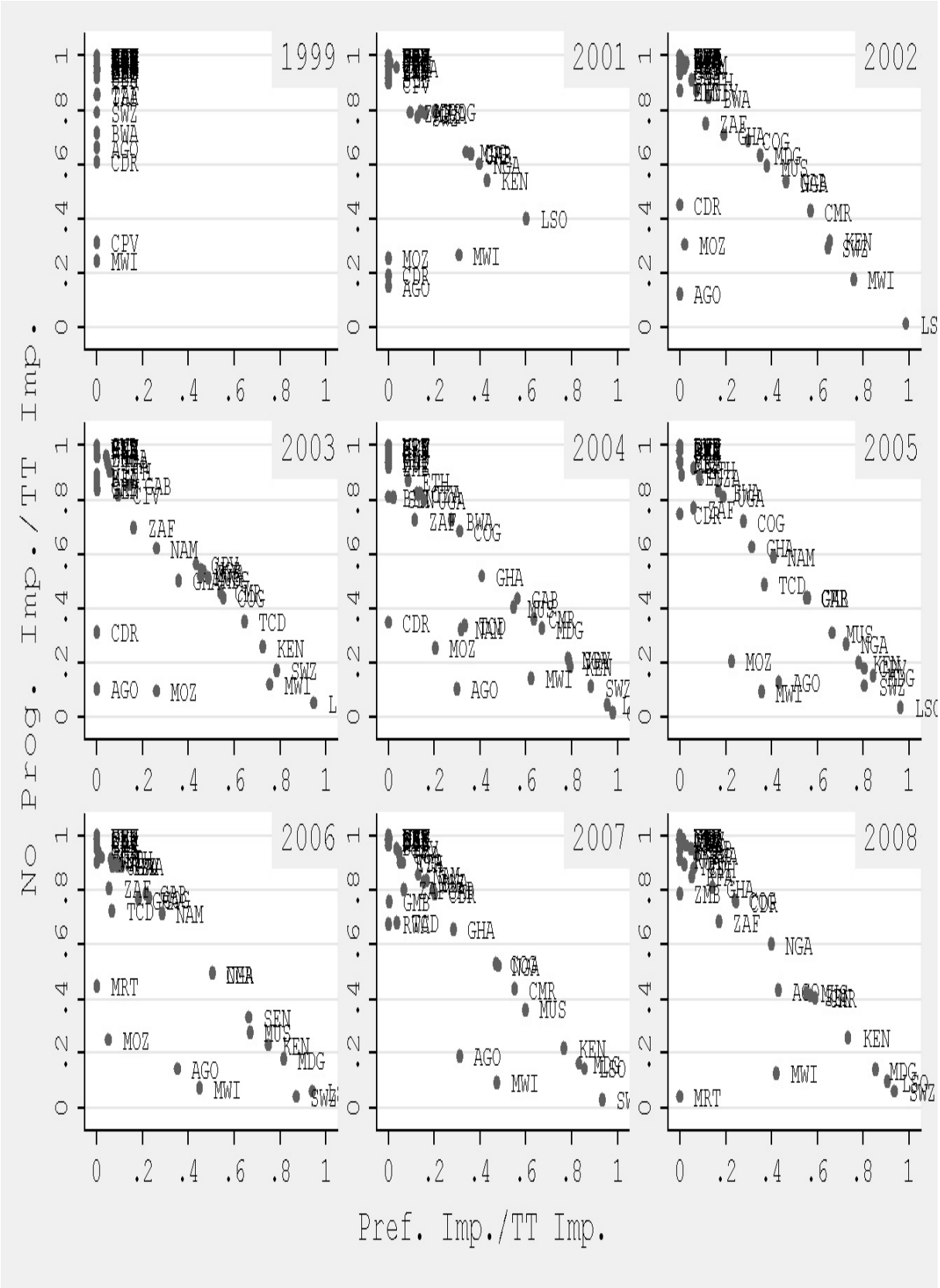


Figure 1: *agoa* vs. No Programme Shares in total Imports

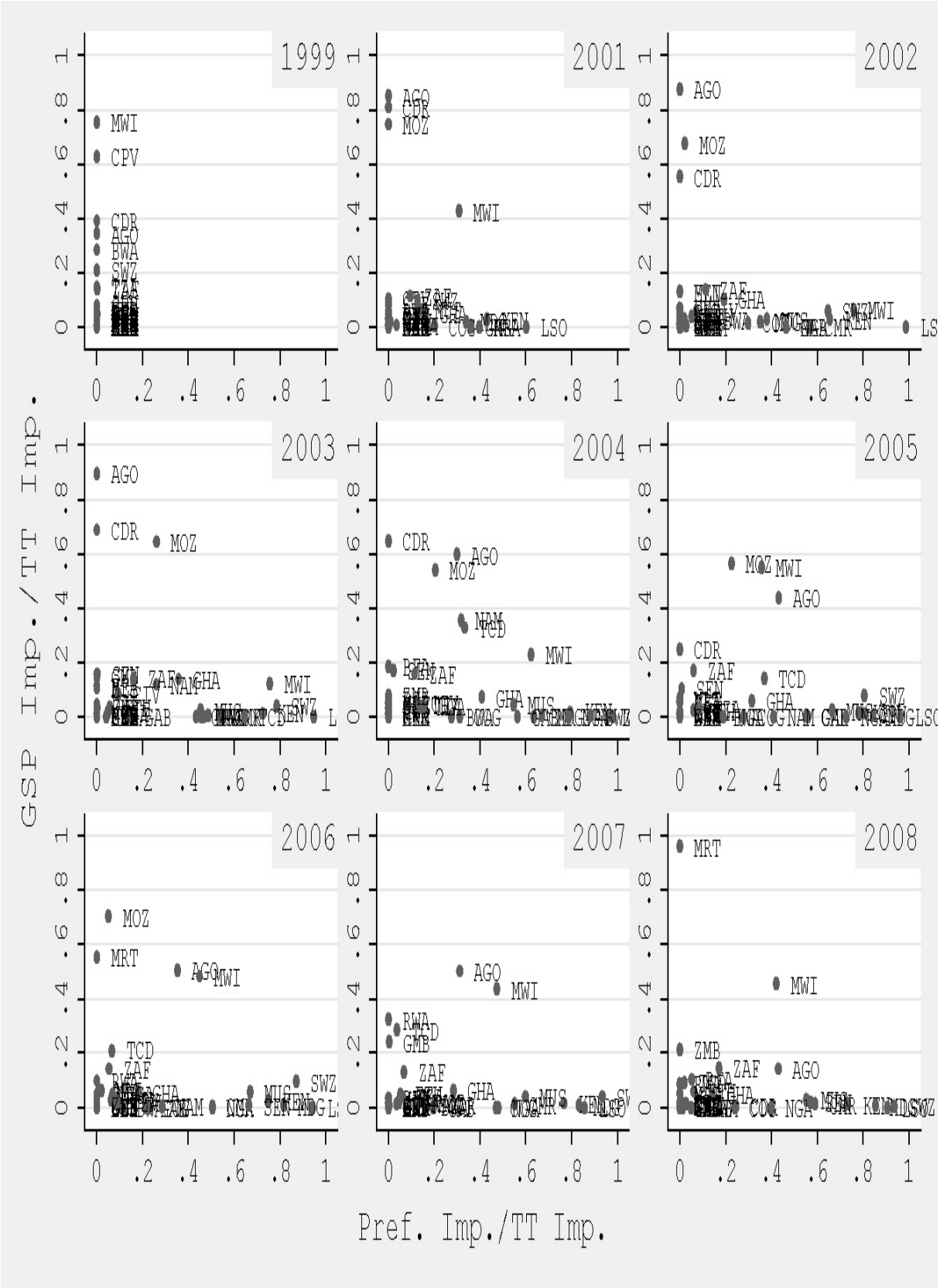


Figure 2: *agoa* vs GSP Shares in total Imports

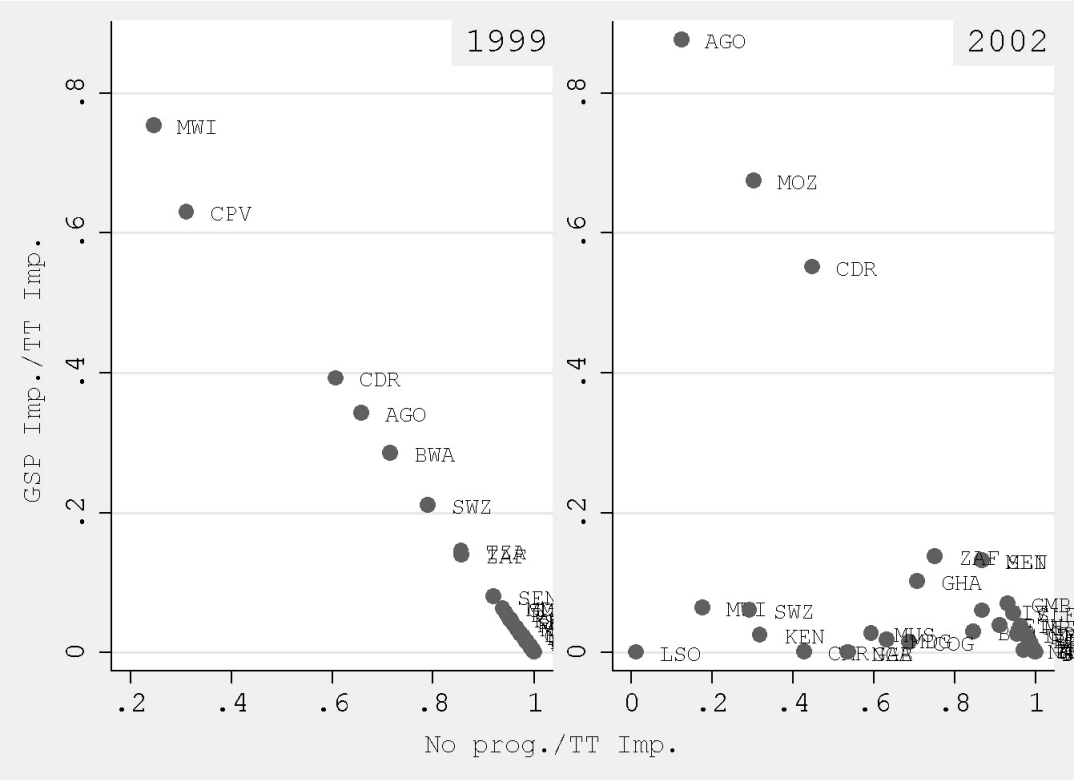


Figure 3: *Non Programme* vs GSP Shares in total Imports

2.2 Theoretical Framework

2.2.1 Preferential Trade Agreements

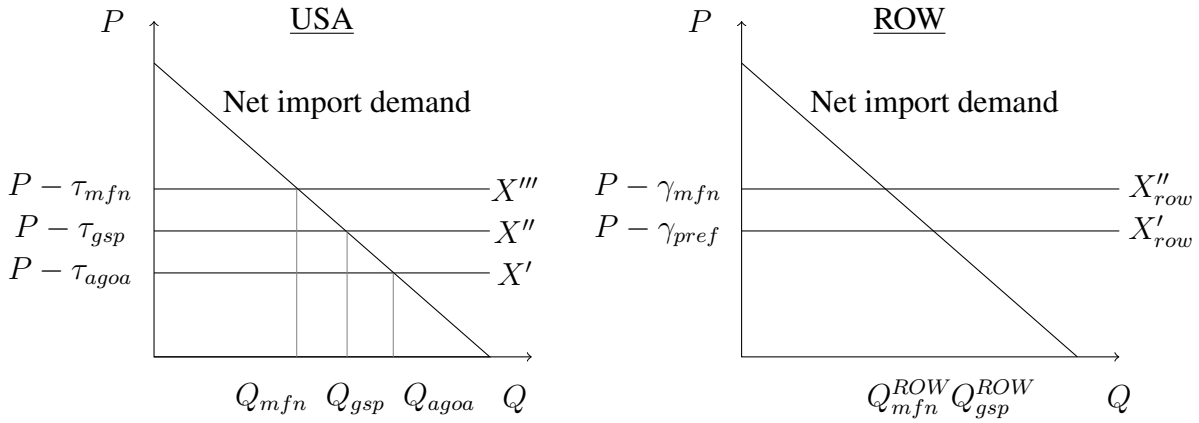
The customs union theory of Viner (1950) and Meade (1955) have formed the basis for most of the theoretical discussion of preferential trade agreements. In their customs union theory, trade can either be "trade creating" or "trade diverting". Trade creation happens to be the more favourable outcome whereby welfare of countries in the union improves. Trade diversion on the other hand, leads to lower welfare for member countries. In line with this tradition there have been other works such as Cooper and Massell (1965), Lipsey (1960), Lipsey and Lancaster (1956) and McMillan and McCann (1981) that review the existing Vinerian tradition and in some cases extend the work of Viner (1950). Lipsey and Lancaster (1956) provide an analysis within the framework of the second best theory McMillan and McCann (1981) in particular provide a synthesis of the works of Meade, Vanek and Lipsey. They suggest that a country gains from forming a customs union if their import competing items are net substitutes with the imported items (McMillan and McCann, 1981). In this case, the partner country's welfare improves from the formation of the union (McMillan and McCann, 1981). An implication they highlight is that, if all commodities are net substitutes, gradual tariff reduction becomes an incentive for global free trade. Kemp and Wan (1976) is also an extension that is popular within this literature. Kemp and Wan (1976, 1) suggest that "... there exists

a common tariff vector which is consistent with pre-union world prices and, therefore, with pre-union trade patterns and pre-union levels of welfare for nonmembers." Essentially, this suggests that welfare for members improves while that of the rest of the world does not necessarily fall (Krishna, 2005). More recently, Krishna (2005, 2012), Panagariya (1997, 2000) and Panagariya and Krishna (2002) have provided surveys of the preferential trade agreement literature as well as extensions in new directions.

Krishna (2003) presents an empirical implementation of the role of geography in preferential trade agreements. Krishna (2003) find that geographic proximity and trading volumes do not affect welfare significantly and thus find no support for the natural trading partners theory for the specific instance of USA data (this is in line with Panagariya, 1997).

Working within the preferential trade agreement literature, figure (4) is modified to provide the framework within which the analysis in this paper follows. Figure (4) highlights the potential for a country receiving preferential tariffs to increase their supply of exports in the preference giving market. Due to the higher price (as a result of lower tariffs) they supply more relative to other countries that face a higher tariff. Here it is assumed that $\tau_{mfn} > \tau_{gsp} > \tau_{agoa}$ and $\gamma_{mfn} > \gamma_{pref}$; $\tau_{mfn} = \gamma_{mfn}$ $\tau_{gsp} = \gamma_{pref}$ initially; costs associated with uptake of the preferences (for example rules of origin and associated costs) are ignored; exporters from the beneficiary countries are prices takers and individual countries cannot influence prices on the world market or in the USA. The starting point is where *mfn* and preferential tariffs are the same for both destinations. The imposition of a third tariff lower than the existing tariffs then results in the changes discussed below.

These exporters would supply as much of the product given the world prices (P). The differentiation in prices is provided by the different tariffs applied on exports supplied. The greater the price differential, the more incentive firms in beneficiary countries have to export more to the USA. As long as $\tau_{agoa} > \gamma_{pref}$ it would motivate exporters to switch to the USA market. This occurs more readily if firms are already exporting to the USA. However, for firms not exporting to the USA this would then depend on the costs of finding partners in the USA and satisfying rules of origin requirements. If the gains from the lower tariffs are larger than the costs facing firms, then the firms would take up the new market opportunities. In this example, the export supply curves are not shifted down given that the beneficiaries are price takers. In addition, given the levels of exports, it is expected that, exports switched from the ROW to the USA would be covered by the remaining countries to maintain the existing equilibria. The difference is that with the new equilibria, there are fewer exports from *agoa* beneficiaries to ROW but more exports to the USA under the *agoa* tariffs. Not only a switch of exports from ROW but also, one should expect already existing exports to the USA to be realigned with a higher composition of exports under the lower *agoa* tariffs. Thus, within the USA exports under *agoa* would displace some of the already existing exports under *gsp* and *mfn* categories for the beneficiary countries.



The X's stand for the export supply at the various tariffs. P is the world price, τ_i and γ_i represent the tariffs, γ_{pref} represents any competing preferential or *gsp* tariffs offered by ROW. The *mfn*=most favoured nation tariff.

Figure 4: Net Import demand and tariff preferences

2.2.2 Constant Market Share Analysis

The constant market share analysis framework is reviewed here also since it bears some similarities to the analysis carried out in this paper. The theory traces its roots to Leamer and Stern (1970), Richardson (1971a,b) and Tyszynksi (1951). Recent work on the topic include Ahmadi-Esfahani (2006), Fagerberg and Sollie (1987) and Merkies and van der Meer (1988). The review here together with the framework presented in the previous subsection (section (2.2.1)) above forms the basis of the propositions outlined below and tested in the results section.

The theory by Leamer and Stern (1970) and Richardson (1971a) suggest that, the market share of a country depends on the share of its exports in world exports and its competitiveness relative to the world.

$$s \equiv \frac{q}{Q} = f\left(\frac{c}{C}\right),\ f' > 0\,,$$

where s is the market share, q is exports of the country of interest, Q is world exports or exports of a reference country, c and C are the competitiveness of the country of interest and the world respectively. This leads one to the identity,

$$\dot{q} \equiv s\dot{Q} + Q\dot{s} = s\dot{Q} + Qf'\left(\frac{\dot{c}}{C}\right)$$

where the dot over a variable represents its derivative with respect to time. The identity suggests that a country's growth in exports can be decomposed into growth as a result of an increase in world exports and a competitive effect due to changes in the competitiveness of the country (Richardson, 1971a). The model above is for total exports, however, this can be disaggregated over destination markets and products and the result would

still hold (Richardson, 1971a).

$$s_{ij} \equiv \frac{q_{ij}}{Q_{ij}} = f_{ij}\left(\frac{c_{ij}}{C_{ij}}\right),\ f'_{ij} > 0\ ,$$

where i refers to a commodity and j to an export destination. Similarly, the decomposition is,

$$\dot{q} \equiv \sum_i \sum_j sij\dot{Q_{ij}} + \sum_i \sum_j Q_{ij}\dot{s_{ij}}$$

This motivates the framework below for motivating the choice of matching in this section. The matching approach requires as explained in the next section the construction of a counter-factual based on a control group of countries. Thus using matching one is able to compare the shares, export growth as well as the levels of exports to the reference group of countries formed by the counter-factual—on the basis of an estimated propensity score. Using the framework, the export shares for each *agoa* beneficiary i to destination j can be written as exports of the *agoa* countries relative to the counter-factual countries forming the reference group.

$$s_{ij} \equiv \frac{x_{ij}}{x_{rj}} = f\left(\frac{p_{ij}}{p_{rj}}\right),\ j \in (EU, USA, ROW),$$

$$i \in (agoa\ countries),\ r \in (reference\ countries)$$

In similar fashion, the increase in exports of the *agoa* beneficiaries can be decomposed into the growth effect due to the reference countries and a competitive effect. Borrowing from Leamer and Stern (1970) and Richardson (1971a), the growth effect arises from the growth in their exports as a result of keeping their shares constant (in other words, due to prices not changing). On the other hand, the competitive effect is due to the relatively lower tariffs that provides them with favourable prices making their exports more competitive in market j.

$$\dot{x_{ij}} \equiv s_{ij}\dot{x_{rj}} + x_{rj}\dot{s_{ij}} = f\left(\frac{p_{ij}}{p_{rj}}\right)\dot{x_{rj}} + x_{rj}f'\left(\frac{\dot{p_{ij}}}{p_{rj}}\right),$$

Thus, much of the gains made in increasing exports would be due to the relatively more attractive tariff preferences and the selection of products exported. In other words, favourable preferences leading to higher prices being received by the exporters is supposed to spur export growth. Growth would be from an increase in total exports by the *agoa* beneficiaries and partly from the higher shares they obtain in the market. Exporters exporting to destinations offering lower tariffs receive a higher proportion of the price—thus they increase their exports to destinations with lower tariffs—thereby increasing the countries exports to that particular destination. However, the response of exports will depend on whether the lower tariffs are provided for products the preference beneficiaries have a comparative advantage in production as well as their competitiveness in the market relative to other exporters.

2.2.3 Theoretical framework for using matching

Section (2.1) highlighted the increase in *agoa* exports for beneficiaries. The noticeable feature was that the level of exports upon which comparisons are made were fairly low compared to the Caribbean Basin countries. The graphs also highlighted the restructuring of exports to the USA and showed the increasing share of *agoa* exports to the USA out of total exports by beneficiaries. Based on the above, four propositions would be presented and tested in the empirical analysis. At the moment these are only presented as propositions/hypotheses short of providing any rigorous mathematical proofs, but relying on economic intuition and the framework presented above to present the arguments in this section.

For simplicity, exports of each country is considered to three destinations—the EU, USA and the rest of the world (ROW).

$$X^i_{world} = \sum_{i=1}^{k}\sum_{i=1}^{j-2} X^i_{ROW} + \sum_{i=1}^{k} X^i_{USA} + \sum_{i=1}^{k} X^i_{EU},$$

where X represents exports in each case. Taking the share of exports to each destination in total exports and rearranging gives the following relationship,

$$s^i_{USA} = 1 - s^i_{ROW} - s^i_{EU},$$

where s represents the share in total exports. An implication of the above relationship is that for any increase in the share of exports to the USA, exports to the EU or to ROW must decrease or some combination that would yield a lower aggregate share. The propositions listed below are based on this relationship and for the moment the EU is subsumed under ROW. This does not necessarily alter any of the conclusions. However, in the analysis EU is considered separately from ROW.

A similarly approach is taken for exports to the USA. Exports to the USA are assumed to be under either *gsp* exports, *no programme* (or *most favoured nation (mfn) tariff*). For the purposes of this study, the residual exports that are not any of the above are considered *non–gsp* to make it easier to compare this category across countries. Thus, total exports (X^i) for each country to the USA is composed of *gsp*, *non–gsp* and *no programme* exports.

$$X^i_{USA} = \sum_{i=1}^{k} X^i_{GSP} + \sum_{i=1}^{k} X^i_{NG} + \sum_{i=1}^{k} X^i_{NP},$$

The shares out of total exports to the USA is,

$$s^i_{NG} = 1 - s^i_{GSP} - s^i_{NP},$$

From the above, any increases in *non–gsp* exports must either be as a result of a decrease in the share of *gsp* or *no programme* exports. Arguably, this presupposes that any

increases would result in exports switching from one destination to the other or from one programme to the other. In the analysis, the two share equations need to analysed to provide definitive indications as to whether exports to the USA increased in addition to exports being shifted from the other tariff categories to the *non–gsp* category. For *agoa* beneficiaries, the *non–gsp* would represent their exports under the *agoa* programme. The are no other special programmes that would overstate the residual.

Proposition 1 (Export Switching/Diversion) *Countries decrease exports to the rest of the world and increase their exports to the USA.*

Proposition 2 (Compositional Change) *Countries do not decrease exports to the rest of the world and their exports to the USA stays the same.*

Proposition 3 (Export Creation) *Countries increase their exports to the rest of the world and also to the USA. But the increase in exports to the USA is proportionately more than the increase in exports to the ROW (trade creation due to increased capacity).*

Proposition 4 (Status Quo) *No compositional changes or increase in exports*

It is likely that a combination of these propositions occur. For instance, it is possible that in the very short-run before plant capacities are increased, proposition (2) would be more likely to hold. Moreover, proposition (1) is more likely to be a short–medium run event while proposition (3) would more likely hold in the longer–run.

Proposition (1) suggests that, the share of *agoa*, *gsp* and *no-programme* exports might all increase in which case one expects the share for *agoa* to increase proportionately more than the other programmes. This increase is postulated to result from a reduction in exports to the rest of the world, which is then taken up in the exports to the USA. Thus one would expect an increase in both the extensive and intensive margins of exports.

In the case of proposition (2), the share of *agoa* exports increases while the share of *no-programme* exports unambiguously falls. The share of *gsp* exports could go either way. I expect the restructuring to be within exports to the USA and hence export levels remain the same. Similarly, one might not expect to see extensive margin effects although one cannot completely rule out intensive margin effects. I thus propose that exports to the USA does not increase, however, exporters already in the market can easily switch to *agoa* from the other programmes if their products are covered by the preference. This follows from the firm level literature on exporting (for example, Bernard and Jensen, 2004, Bernard et al., 2007, 2010, Melitz, 2003) whereby exporting firms have to overcome the sunk cost of exporting and finding new destinations as well as developing new relationships in the USA. For firms already exporting these sunk costs would have already been incurred and existing trade relationships established. The only changes necessary would be in applying for the *agoa* preference as the product reaches the USA instead of the programmes chosen previously. This is a more probable scenario

and not only is it of benefit to the exporters but also should allow the importing firms in the USA to receive products at some fraction of the costs they had in previous years.

For proposition (3), the share of *agoa* exports might increase more than proportionately relative to the shares of *gsp* and *no-programme* shares This suggests an expansion of exports bordering on both intensive and extensive margins. Finally, for Proposition (4) no changes are expected and the status quo remains. Thus intensive and extensive margin effects would not be realised.

Propositions (1–3) are more likely and the data tends to support these. Proposition (4) is unlikely to be supported by the data. In section (4) all three propositions are formally tested. Proposition (3) would provide a more favourable outcome and would allow the conclusion of *agoa* increasing exports to be beyond doubt. Compositional changes do not provide a major structural change in exports and do not provide long lasting changes.

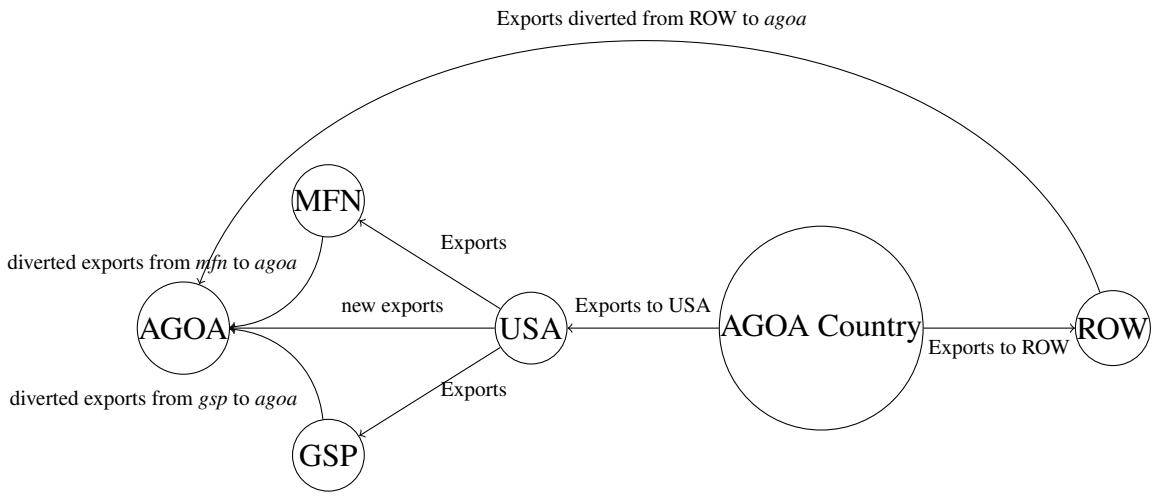


Figure 5: Flow diagram for exports

Figure (5) summarises and links the compositional changes in exports to the USA together with any diversion from exports from ROW. The directional arrows represent exports by the beneficiary country while the looped arrows represent exports that are diverted due to the introduction of the *agoa* preference. Three separate theoretical views have been reviewed in section (2.2). Although each approach has an essentially different construction, there are interesting similarities. All three approaches for instance, rely on price information which results in an increase in exports. For example, the constant market share framework's identity depends on relative prices. Allowing tariffs to affect relative prices thereby yielding favourable prices for the *agoa* beneficiaries leads to increased exports. A point which the preferential trade agreement literature shows that in some cases leads to trade creation within a customs union. Finally, the motivation for the matching approach presented above draws on these theories and although there is no formal linkage—this is implicit in the results. The next section, throws more light on

the econometric framework and data used in the paper.

3 Econometric Approach and Data

The matching approach is expected to provide a causal explanation to whatever increases in exports of *agoa* countries is observed. Since one does not observe what the exports of these countries would be after the enactment of *agoa*, countries that were not provided these preferences are used as the counter–factual. The assumption is that these countries provide the trend in exports that would have been observed for the preference beneficiaries. Thus, after matching—an increase in exports of preference beneficiaries would imply that the preferences have contributed to higher exports from the beneficiary countries. One can therefore attribute this difference, to their preferential status. However, if there is no difference in exports, then the preferences might not have been the main instrument in the export performance of the preferential beneficiaries. Matching is done on similar economic, political, cultural and other factors in order to limit the influence of these characteristics in driving the results.

Randomisation as noted by Lee (2005) is difficult to undertake. Observational data or in this case data on countries are not randomised and thus treated and control groups may vary significantly in terms of their characteristics. This difference can be removed by the use of matching as argued in for example Lee (2005). Lee (2005) notes that the outcome y_i is uncorrelated with the treatment in cases of randomised experimental data. This condition might hold if the treatment is exogenous and for reasons unrelated to y_i (Lee, 2005). Examples could be a new law or regulation or due to natural events for example the weather or geography (Lee, 2005). Since the *agoa* policy was a new law, this motivates the choice of approach here. As discussed in the literature on matching—comparing groups of treated individuals and controls where there is no randomisation leads to biases (Guo and Fraser, 2010, Lee, 2005, Rosenbaum, 1987, 1991a, 2002, 2004, 2010, Rosenbaum and Rubin, 1983b).

Differences due to individual characteristics lead to overt bias and differences in the unobservables (ϵ) give rise to hidden (overt) biases (Lee, 2005). Overt and hidden biases can affect the treatment effects. Guo and Fraser (2010) and Lee (2005) note that overt biases can easily be controlled and removed by incorporating z covariates in the estimation of the propensity score. On the other hand, hidden (covert) biases are more difficult to remove and control for (Guo and Fraser, 2010, Lee, 2005). Overt biases occur when $E(y|X = 1) \neq E(y|X = 0)$ due to some differences in the z covariates while differences in ϵ leads to hidden biases (Guo and Fraser, 2010, Lee, 2005, Rosenbaum, 1987, 1991a, 2002, 2004, 2010).

As discussed in the literature on matching—comparing groups of treated individuals and controls where there is no randomisation leads to biases (Guo and Fraser, 2010, Lee, 2005, Rosenbaum, 1987, 1991a, 2002, 2004, 2010, Rosenbaum and Rubin, 1983b). Some expected problems from the matching procedure include dimension problems—

where the treated and controls differ in characteristics and common support problems—where the treated and controls fail to overlap in their propensity scores (Lee, 2005). Propensity score matching helps solve the dimension problem while the common support problem is solved by having the propensity score lie between zero and one (Guo and Fraser, 2010, Rosenbaum and Rubin, 1983b). These issues are further discussed on page 19.

For my purposes, the treatment is the exogenous policy provided by the USA for selected SSA countries. The *agoa* preference thus becomes the treatment. The response of interest is the export performance of the beneficiaries in terms of their exports to the USA, EU and ROW. I define this in various ways to test the sensitivity and robustness of the outcomes and also allowing for the propositions outlined in section (2.2.3) to be tested. The responses of interest in this case are:

1. Outcomes comparing exports by each beneficiary to three destinations—USA, rest of the world (ROW) and EU. Using the previous definitions in section (2.2.3) total exports is considered for three destinations as $X^i_{world} = \sum_{i=1}^{k} \sum_{i=1}^{j-2} X^i_{ROW} + \sum_{i=1}^{k} X^i_{USA} + \sum_{i=1}^{k} X^i_{EU}$
   (a) Exports to the USA out of total exports for country i $\left(\frac{X^i_{USA}}{X^i_{world}}\right)$
   (b) Exports to the ROW out of total exports for country i $\left(\frac{X^i_{ROW}}{X^i_{world}}\right)$
   (c) Exports to the EU out of total exports for country i $\left(\frac{X^i_{EU}}{X^i_{world}}\right)$
2. Outcomes comparing changes in the composition of exports to the USA. Here exports to the USA (X_{USA}) is composed of *gsp*, *no-programme (NP)* and *non-gsp (NG)*: $X^i_{USA} = \sum_{i=1}^{k} X^i_{GSP} + \sum_{i=1}^{k} X^i_{NG} + \sum_{i=1}^{k} X^i_{NP}$
   (a) GSP exports out of total exports to the USA for country i $\left(\frac{X^i_{GSP}}{X^i_{USA}}\right)$
   (b) Non–Program exports to the USA out of total exports for each country i $\left(\frac{X^i_{NP}}{X^i_{USA}}\right)$
   (c) Non–GSP exports out of total exports for country i $\left(\frac{X^i_{NG}}{X^i_{USA}}\right)$

For ease of exposition, *agoa* exports are subsumed under *non-gsp* exports. The term *non-gsp* is used to denote the residual exports after taking out *gsp* and *no-programme* exports from total exports to the USA (that is, $X^i_{NG} = X^i_{USA} - X^i_{GSP} - X^i_{NP}$). Doing this makes the counter-factual comparable to the *agoa* countries. It is noted that, for some countries in the Caribbean Basin, this would be a combination of two different preferential programmes in some cases—for instance the *Caribbean Basin Initiative (CBI)* or *Caribbean Basin Trade Protection Act (CBTPA)*. For other countries, this would constitute exports under a free-trade agreement for example, the Central American countries and Dominican Republic. Additionally, special bilateral or multilateral agreements in specific products might be captured here also—for example, Israel and some countries in the Middle East. However, Israel and some Middle Eastern countries with high income are excluded—thus, this does not pose a problem. And for a number

of countries the residual would be zero. This does not diminish the analysis but allows for a comparable quantity to be analysed.

In the analysis, I use mirror exports instead of reported exports for both items (1) and (2) above. For item (1), the reason for using mirror exports is that these are recorded more accurately than the exports reported by developing countries and these are obtained from the UN–Comtrade database. In terms of the second item above, I resort to data from United States International Trade Centre (USITC) which accurately reports the various categories under which imports arrived in the USA. As a final check I use two versions of the outcome in (1a). The data from UN-Comtrade and USITC are both used to check the sensitivity and robustness of the results for exports to the USA.

I expect (1a) to show an increase while (1b) should unambiguously decrease. For (1c) this could go in either direction depending on whether the decrease in (1b) absorbs all the increase in (1a). The fact that the EU is also a major partner of the *agoa* beneficiaries and that, they also offer competing preferences makes the sign on (1b) ambiguous a priori. For item (2), the sign of the outcome variable in sub-item (a) is also ambiguous. However, the signs for (b) and (c) respectively are unambiguous. An increase is expected for (c) while a decrease is expected for (b). These inferences are made due to the earlier discussion in section (2.2). The econometric framework is now discussed below.

$$\tau_{ATE} = E(\tau) = E[y^1 - y^0] \quad (1)$$

$$\tau_{ATT} = E[\tau|X=1] = E[y^1 - y^0|X=1] = E[y^1|z, X=1] - E[y^0|z, X=1] \quad (2)$$

$$\hat{P(z)} = Pr(X=1|z) \quad (3)$$

$$agoa = \begin{cases} 1 & \text{if} \quad agoa\ beneficiary \\ 0 & \quad otherwise \end{cases}$$

$$\tau_{i,j} = arg\ min\ |\hat{P}_i^1 - \hat{P}_j^0| \quad i \in T, j \in C \quad (4)$$

Where: X is the *agoa* treatment, y is either the levels or shares of mirror exports to the USA, EU or rest of the world (ROW) in the total mirror exports of country j as well as the *gsp*, *non–gsp* and *no programme* import shares and levels by the USA from country j and z - is a vector of variables used in estimating the propensity score for matching *agoa* beneficiaries to *non-agoa* developing countries. This vector includes economic variables, political variables, country characteristics and other variables such as landlocked, physical capital per worker, land per worker among others. T and C are treated and control country sets respectively. The t subscript is not shown in order not to clutter the equations above and for ease of exposition.

Equation (1 & 2) define the problem at hand, I seek to find the difference between the outcome variable before and after the treatment. However, it is difficult to observe $E[y^0|z, X = 1]$ — the counter-factual. Hence, the counter-factual is con-

structed by selecting countries with characteristics similar to the treated countries — $E[y^0|z, X = 1] = E[y^0|z, X = 0]$. The countries are matched based on the vector z—allowing one to select countries that are very similar prior to the treatment. When matching is done well it allows for a causal inference to be made (Yasar and Rejesus, 2005). This allows a comparison to be made and thus any difference in the outcome variables can be attributed to the preference There are slight differences between the *ATT* and *ATE*. The *ATT* estimate is preferred here since the *agoa* treatment is targeted at SSA countries and its coverage does not extend beyond SSA. In cases where the policy is targeted the *ATT* estimate provides an impact of the policy for the target group (Caliendo and Kopeinig, 2008). The vector y^1 is the outcome variable for the treated group (*agoa* beneficiaries) and y^0 is that of the control group created (that is, the manufactured counter-factual for the *agoa* group of countries). Equation (3) is the propensity score in general form estimated conditional on the vector of characteristics. This is estimated via a logit regression and the predictions from this regression becomes the propensity score used for matching *agoa* recipients to *non-agoa* countries. Equation (4) specifies that treated countries with a propensity score ($\hat{P(z)}$) close to a control country are matched together—as they are similar, based on the covariates chosen.

In matching, it is often difficult obtaining a match. In order to avoid this problem, one could match the propensity score using the *nearest neighbour*, *caliper/radius*, *kernel*, and *stratification* matching methods. As is common in practise, a combination of the various methods are employed. However, all methods are employed in the next section allowing for the sensitivity and robustness of the estimates to be checked. In the nearest neighbour matching, preference beneficiaries and non preference beneficiaries are randomly ordered and the non preference beneficiaries with the score closest to the beneficiary is selected. The nearest neighbour finds the nearest control country to match with a treated country. Matching can be one-one or one-many, that is either one control to each treated unit or more than one control to each treated unit. In addition, a control can be matched to a treated unit more than once—matching with replacement (Caliendo and Kopeinig, 2008, Guo and Fraser, 2010, Khandker et al., 2010).

The nearest neighbour matching estimated in the next session is done without replacement and a one-one nearest neighbour matching is performed. The nearest neighbour (NN) is given by

$$NN = \min |\hat{P}_i^1 - \hat{P}_j^0| \quad i \in T, j \in C,$$

In addition, to using the propensity score with the nearest neighbour, the mahalanobis metric matching (NN_{maha}) discussed at length in Abadie and Imbens (2002, 2011), Abadie et al. (2001) and Rosenbaum and Rubin (1985) is also included as a check on the propensity score matching estimates. This estimator is a distance estimator and it uses the covariance matrix COV of the matching variables to match the treated and

control countries.

$$NN_{maha} = (z_i - z_j)' COV^{-1}(z_i - z_j) \quad i \in T, j \in C,$$

The control country with the minimum distance NN_{maha} is chosen for the treated country. Again, matching is done without replacement and both treated and control countries matched are taken off after the match. Abadie and Imbens (2011), Abadie et al. (2001) and Abadie and Imbens (2002) point out that one problem with this approach is that in finite samples there is a bias of order $O_p(N^{-\frac{1}{k}})$ when continuous covariates are used (where k is the number of continuous covariates). The bias results from the differences in the continuous covariate values between treated and control groups (Abadie and Imbens, 2002, 2011, Abadie et al., 2001) The bias-corrected estimator reduces the bias but does not entirely eliminate it thereby making it $\sqrt{N}$ consistent (Abadie and Imbens, 2002, 2011). A bias of order $O_p(N^{-\frac{1}{6}})$ to $O_p(N^{-\frac{1}{9}})$ is expected in this analysis. The use of the bias-correction based on the matching variables used in the regression would be useful in reducing most of this bias.

The *caliper/radius* matching on the contrary, requires us to define a region of *common support*—(δ) and randomly select non preference beneficiaries that have a similar propensity score within the defined region. This in a way improves on the quality of matches obtained (Guo and Fraser, 2010, Lee, 2005). The nearest neighbour in some cases can match treated and control countries that have very different propensity scores (Guo and Fraser, 2010, Lee, 2005). The caliper, therefore provides the opportunity to place a threshold on the difference in propensity scores between the treated and controls that are matched (Guo and Fraser, 2010, Lee, 2005). I experiment with calipers in the region of 0.05 and 0.01 to check the sensitivity of the results to the caliper chosen. The *caliper* match is given as, $\delta > |\hat{P}_i^1 - \hat{P}_j^0| = arg\ min\ |\hat{P}_i^1 - \hat{P}_j^0| \quad i \in T, j \in C$, where $\hat{P}_i^0$ and $\hat{P}_j^1$ are the estimated propensity scores of the controls and treated respectively. The caliper choice is informed by Rosenbaum and Rubin's (1985) suggestion for choosing a *caliper* size that reduces a large percentage of the bias. According to Rosenbaum and Rubin (1985), the suggested *caliper* size is given by $0.1 \times (s_1^2/s_0^2) \times \sqrt{[(s_1^2 + s_0^2)/2]}$ where s_1^2, s_0^2 are the sample variances for treated and control countries respectively.

Bandwidth parameters of 0.05, 0.01 and 0.001 are used for the kernel estimator. Again, varying the bandwidth allows one to check the sensitivity and robustness of the kernel matching estimates to the size of the bandwidth. The kernel matching is given by

$$\kappa = \frac{k\left(\frac{\hat{P}_j^0 - \hat{P}_i^j}{a_n}\right)}{\sum_{l \in C} k\left(\frac{\hat{P}_k^0 - \hat{P}_i^1}{a_n}\right)} \quad j \in C, i \in T$$

$k(\cdot)$ is the kernel function. The Epanechnikov kernel is used in all kernel estimations in the section 4. The kernel matching estimator uses a weighted average of the control group of countries to construct each treated countries counter-factual.

Last but not the least, the stratification matching allows the propensity score to be divided into strata (or blocks/intervals). The mean difference between the treated and control countries are then calculated within each strata (Caliendo and Kopeinig, 2008, Khandker et al., 2010). After which, the overall weighted mean is calculated over all strata to obtain the *ATT* estimate.

To strengthen the conclusions, a difference-in-difference matching estimation is also done. This is possible since observations of the outcome variable before and after the inception of *agoa* are available in the data. It is thus possible to use the difference in outcomes to calculate the *ATT* estimate for the outcomes. This is given by

$$\tau_{ATT}^{DID} = E[\Delta y^1 | X = 1, \hat{P(z)}] - E[\Delta y^0 | X = 0, \hat{P(z)}]$$

where $\Delta y^1 = y^1_{before} - y^1_{after}$ and $\Delta y^0 = y^0_{before} - y^0_{after}$, y^1_{before}, y^0_{before} is the average of outcomes in the period 1996–1999 and y^1_{after}, y^0_{after} is the average for the period 2001–2011 (2001–2010 for UN Comtrade data on mirror exports to EU, USA and ROW)

Equation (2) can be rewritten as

$$E[y^1 | X = 1, z] - E[y^0 | X = 0, z] = \tau_{ATT} + (E[y^0 | X = 1, z] - E[y^0 | X = 0, z])$$

To identify τ_{ATT} within the framework the second term (in brackets) must be equal to zero, that is $E[y^0 | X = 1, z] - E[y^0 | X = 0, z] = 0$. If $E[y^0 | X = 1, z] - E[y^0 | X = 0, z] \neq 0$, then the *ATT* estimate would be biased and due to differences in the treated and control group of countries (Caliendo and Kopeinig, 2008)—leading to *selection bias*. In order for the *ATT* estimate to be identified the following two assumptions suggested by Rosenbaum and Rubin (1983b) and Caliendo and Kopeinig (2008):

- *Unconfoundedness:* $y^0, y^1 \coprod X | z$. The outcomes are assumed to be independent of the *agoa* treatment after controlling for observed covariates. This assumption is plausible since the policy is exogenous—the preference is extended to SSA countries by the USA.
- *Overlap:* $0 < \hat{P}(X = 1|z) < 1$. The propensity score for the treated and controls must lie between zero and one. In other words, their distributions must have a considerable overlap.

Caliendo and Kopeinig (2008) argue that in estimating τ_{ATT}, the weaker versions of the assumptions above can be used. Thus, unconfoundedness of the controls ($y^0 \coprod X | z$) and the propensity score less than one ($\hat{P}(X = 1|z) < 1$) are enough for identification

The presence of *selection bias* is a problem expected to be present in the analysis. Controlling for the covariates in the propensity score estimate would solve the selection bias that occurs due to covariate differences. On the other hand, the selectivity bias arising from unobserved factors is more difficult to resolve and can still lead to highly biased estimates. Using a difference-in-difference matching estimator is an attempt at reducing the problem. However, the literature suggests carrying out sensitivity tests to

check for problems with unobserved factors. Two of these tests are Rosenbaum's bounds analysis (DiPrete and Gangl, 2004, Rosenbaum and Rubin, 1983a, Rosenbaum, 1987, 1991a, 2010, 2012) and Ichino et al. (2006) and Nannicini's (2007) sensitivity design. Ichino et al. (2006) tests are carried out in the text (Table 19) while Rosenbaum's bounds analysis is presented in the appendix (Tables 26 & 27).

Data is obtained from several sources. The World Development Indicators and IMFs International Financial Statistics databases provide macroeconomic indicators (such as, gross domestic product, inflation, population, value-added (in industry, manufacturing, agriculture, construction, services, etc), interest rates, exchange rates among others) for the purposes of matching similar countries. Additionally, Kaufmann's Global Governance[1], Database of Political Institutions[2], Polity IV and Bates et al (2005)[3] databases provide political, cultural and religious data to augment the vector of control variables needed to perform a realistic match.

A panel of 35 treated countries from SSA and some 130 control countries (developing countries in Asia, Latin America and the Caribbean as well as North Africa) for the years 1991 – 2010 (in some cases 2011 data where available is included for imports by the USA) is employed in the study. After matching the number of control countries included in the estimation drops to 26–40 countries. Table (2) shows the number of treated and control countries falling within each block of the propensity score as well as the overall number of treated and control countries matched. Nielsen and Sheffield (2009) note that longitudinal data can create problems for matching—this is due to what they call the, *"double dimensionality of panel data"*. They also discuss some of the ways in which researchers have attempted to get around the problem. Matching is done in three different ways based on the data available taking into account the concerns of Nielsen and Sheffield (2009). The three approaches undertaken here allow us to check the sensitivity and robustness of the results as well as get around the problem due to the longitudinal nature of the data.

1. *Pre-agoa* controls and *post-agoa* outcomes are averaged and merged into one dataset. The propensity score is then estimated on the *pre-agoa* control variables and the matching is done based on the *post-agoa* outcomes.

2. A matched difference-in-difference is carried out. As mentioned earlier, to control for unobserved factors as well as overcome any problems created by averaging the data. The difference outcomes are constructed and merged with the *pre-agoa* control variables. After which, matching is carried out on the differenced outcomes.

3. Matching is done on an annual basis. The *pre-agoa* controls are merged with the

[1] www.worldbank.org/wbi/governance/

[2] Thorsten Beck, George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh, 2001. "New tools in comparative political economy: The Database of Political Institutions." 15:1, 165-176 (September), World Bank Economic Review.

[3] Robert Bates ; Karen Feree; James Habyarimana; Macartan Humphreys ; Smita Singh, "Other Political Data (updated 2005)", http://hdl.handle.net/1902.1/14977 UNF:5:XzsUmjt4AZzpm9JB3hO6pA== Murray Research Archive [Distributor] V1 [Version]

panel formed for the outcome variables. The matching is then carried out for each year for all countries within the common support region. The results here can be averaged over the period to obtain a single estimate for the whole period to compare with the estimates in (1) above.

In the estimation I exclude exports to USA and EU from exports to the world to define the outcome for the rest of the world. The USA and EU are considered separately here because for most preference beneficiaries these two countries account for 30% – 60% of their exports. In addition, this allows the effect on exports to the rest of the world to be well determined. Nevertheless, one is then able to examine what is happening to exports to two of their main export destinations. Moreover, reiterating a point made earlier, it would be useful to see the effects on their exports to the EU given that *agoa* beneficiaries receive competing preferences from the EU. However, it is not the intention to study EU preferences in this paper but just to highlight what is happening to overall exports to the EU in the presence of the *agoa* preferences.

4 Results

4.1 Choice of propensity score and balancing tests

Four propensity score models are estimated. Out of the four models 1 – 3 are chosen. Model 1 is the main model used in the analysis, however, *ATT* estimates are presented for models 2 and 3 to test the sensitivity of the estimates to the choice of covariates in the propensity score model. The choice of model 1 is because all covariates are balanced both within and outside the region of common support. Additionally, the model provides the largest sample of the control countries on common support for the analysis. As advocated in the literature, I include interactions and higher order terms to estimate the propensity score (Guo and Fraser, 2010, Lee, 2005). Figure (6) plots the regions of common support of the estimated propensity score. Sub-figures (a) – (d) show the graphs of models (1) – (4) respectively. A sizeable chunk of the control countries fall outside the common support area. However, I do get a considerable number (26–40 countries) falling within the common support area. In addition, all the treated countries (with the exception of model 4) lie within the common support area. All preliminary checks on the propensity score indicate a good balance between the controls and the treated countries. All four models pass the balancing of the covariates in the optimally selected blocks of propensity score. Table (2) shows the optimal number of blocks—apart from model 2 which has five blocks, the remaining models have six blocks of the propensity score. Further balancing tests following DiPrete and Gangl (2004), Rosenbaum and Rubin (1985) are performed on the covariates used in estimating the various propensity score models. Table (3) reports the two-tailed T-test results and the bias reductions in the covariates before and after matching.

Model 1 has all covariates balanced and shows significant reduction in the bias of

the covariates prior to balancing. Regulatory quality proves to be problematic for the remaining models—it rejects the null hypothesis of equal means after matching. This indicates that the treated and control countries differ in their regulatory quality. It must be noted that the covariate balancing tests conducted in this table is for all countries and thus includes countries outside the common support region. However, the test is passed when only control countries falling within the common support are used. In addition, the variable was balanced each block of the propensity score under common support.

Finally, in Figure (6) model 1 displays fewer control observations in the tails compared to the other models. In addition, fewer gaps exist within the matched units within the common support region of the propensity score.

Table 1: Logit estimates for propensity score

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Landlocked	0.388	0.571	0.531	1.228
	(0.638)	(0.720)	(0.724)	(0.910)
Low Income (LI)	93.80	160.9^{+}	159.0^{+}	
	(59.788)	(90.161)	(91.307)	
Lower Middle Income (LMI)	77.84*	103.7^{+}	102.7^{+}	-55.53
	(37.526)	(54.823)	(55.510)	(49.924)
Majority Christian	0.871		-15.35^{+}	-25.01*
	(0.745)		(8.404)	(11.011)
Majority Muslim	0.478	15.45^{+}		
	(0.736)	(8.413)		
Weighted distance (log)	36.84	44.55	34.78	18.42
	(42.365)	(54.878)	(56.139)	(66.966)
Distance Squared (log)	-1.930	-2.334	-1.797	-0.821
	(2.322)	(2.997)	(3.068)	(3.665)
LI $\times$ Real GDP	36.46^{+}	64.14^{+}	64.37^{+}	72.27^{+}
	(20.676)	(33.671)	(34.203)	(40.116)
LMI $\times$ Real GDP	38.90	72.77^{+}	72.85^{+}	80.73^{+}
	(24.152)	(39.195)	(39.785)	(46.739)
UMI $\times$ Real GDP	48.77^{+}	85.76^{+}	85.71^{+}	95.68^{+}
	(28.390)	(45.407)	(46.077)	(54.061)
Real GDP Squared	-2.838^{+}	-5.191^{+}	-5.202^{+}	-5.758^{+}
	(1.632)	(2.680)	(2.722)	(3.200)
Agric land % of land area		2.085	2.266	1.904
		(1.525)	(1.553)	(1.946)
Other Religion		0.339	-15.07^{+}	-24.56*
		(0.931)	(8.282)	(10.872)
Corruption		-3.298	-3.307	-0.371
		(4.410)	(4.478)	(3.203)
Voice & Accountability		-2.465	-2.688	-4.409
		(2.144)	(2.192)	(2.742)
Regulatory Quality		0.932	0.854	0.647
		(2.323)	(2.360)	(2.851)
LI $\times$ Corruption		2.283	2.093	
		(4.483)	(4.551)	
LMI $\times$ Corruption		-1.610	-1.620	-2.311
		(4.721)	(4.794)	(5.185)
Political Stability		0.988	1.566	2.291
		(1.781)	(2.056)	(2.236)
Muslim $\times$ Real GDP		-2.154^{+}	-2.140^{+}	-3.407*
		(1.168)	(1.166)	(1.522)
GDP per capita (log)		2.732*	2.845*	2.384
		(1.280)	(1.316)	(1.507)
Area (log)			0.109	0.0296
			(0.186)	(0.221)
Upper Middle Income (UMI)				-171.8
				(106.901)
UMI $\times$ Corruption				-4.246
				(5.510)
Adj. Saving per GNI				-6.681
				(4.855)
Constant	-386.5^{+}	-586.1^{+}	-527.6	-315.7
	(228.386)	(322.308)	(327.326)	(328.594)
Observations	111	104	104	91
Chi-square	40.59	52.73	53.08	54.46
Log likelihood	-48.89	-40.06	-39.89	-32.37
Pseudo-R square	0.293	0.397	0.400	0.457

Standard errors in parentheses. Estimation results for the propensity score regressions. Dependent variable is the AGOA treatment. $^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2: Number of Controls and Treated under common support for the four estimated models

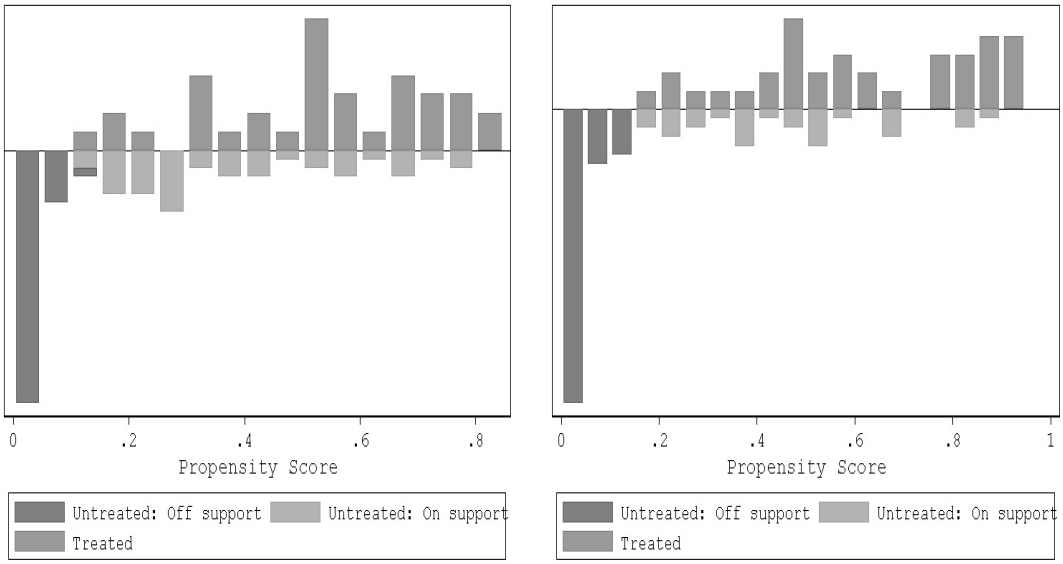
	Model 1			Model 2			Model 3			Model 4		
	Non-agoa	agoa	Total	Non-agoa	agoa	Total	Non-agoa	agoa	Total	Non-agoa	agoa	Total
1	2	1	3	-	-	-	1	1	2	2	1	3
2	15	3	18	7	5	12	8	4	12	5	3	8
3	8	6	14	8	8	16	8	6	14	4	4	8
4	6	10	16	6	8	14	5	9	14	6	6	12
5	6	8	14	4	5	9	4	7	11	4	9	13
6	3	7	10	1	9	10	1	8	9	0	10	10
Total	40	35	75	26	35	61	27	35	62	21	33	54

Table 3: Main Text: Covariate Balancing Tests (All Models)

Variable	Sample	Control (Mean)	Treated (Mean)	% bias	% bias reduction	T-test (P-Value)
Model 1						
landlocked	Matched	.486	.343	-34.261	32.384	-1.067 (.855)
landlocked	UnMatched	.132	.343	50.67		-2.653 (.009)
Low Income (LI)	Matched	.571	.486	-18.944	71.571	-.627 (.733)
Low Income (LI)	UnMatched	.184	.486	66.638		-3.432 (.001)
Lower Middle Income (LMI)	Matched	.314	.371	11.576	-15.152	.439 (.331)
Lower Middle Income (LMI)	UnMatched	.421	.371	-10.053		.491 (.625)
Upper Middle Income (UMI)	Matched	.114	.143	6.659	88.657	.311 (.378)
Upper Middle Income (UMI)	UnMatched	.395	.143	-58.707		2.717 (.008)
Majority Christian	Matched	.314	.4	17.184	43.842	.654 (.258)
Majority Christian	UnMatched	.553	.4	-30.6		1.496 (.138)
Majority Muslim	Matched	.371	.371	0	100	0 (.5)
Majority Muslim	UnMatched	.263	.371	23.167		-1.156 (.25)
Other Religion	Matched	.314	.229	-20.981	-93.22	-.705 (.758)
Other Religion	UnMatched	.184	.229	10.859		-.541 (.59)
Weighted distance (log)	Matched	9.391	9.334	-13.714	82.129	-1.022 (.844)
Weighted distance (log)	UnMatched	9.015	9.334	76.74		-3.353 (.001)
Real GDP (log)	Matched	7.035	7.083	5.364	94.87	.221 (.413)
Real GDP (log)	UnMatched	8.012	7.083	-104.555		5.002 (0)
Distance Squared (log)	Matched	88.228	87.186	-14.102	81.464	-1.009 (.841)
Distance Squared (log)	UnMatched	81.562	87.186	76.078		-3.339 (.001)
LI × Real GDP	Matched	3.715	3.142	-19.448	70.472	-.645 (.739)
LI × Real GDP	UnMatched	1.202	3.142	65.864		-3.384 (.001)
LMI × Real GDP	Matched	2.35	2.7	9.283	45.112	.364 (.359)
LMI × Real GDP	UnMatched	3.337	2.7	-16.913		.813 (.418)
UMI × Real GDP	Matched	.97	1.241	7.193	87.872	.342 (.367)
UMI × Real GDP	UnMatched	3.473	1.241	-59.305		2.739 (.007)
Real GDP Squared	Matched	50.05	50.835	5.795	94.482	.247 (.403)
Real GDP Squared	UnMatched	65.076	50.835	-105.013		4.995 (0)
Model 2						
Agric land % of land area	Matched	.406	.472	32.603	36.116	1.09 (.14)
Agric land % of land area	UnMatched	.368	.472	51.035		-2.418 (.017)
landlocked	Matched	.486	.343	-34.261	32.384	-1.067 (.855)
landlocked	UnMatched	.132	.343	50.67		-2.653 (.009)
Low Income (LI)	Matched	.571	.486	-18.944	71.571	-.627 (.733)
Low Income (LI)	UnMatched	.184	.486	66.638		-3.432 (.001)
Lower Middle Income (LMI)	Matched	.314	.371	11.576	-15.152	.439 (.331)
Lower Middle Income (LMI)	UnMatched	.421	.371	-10.053		.491 (.625)
Upper Middle Income (UMI)	Matched	.114	.143	6.659	88.657	.311 (.378)
Upper Middle Income (UMI)	UnMatched	.395	.143	-58.707		2.717 (.008)
Majority Christian	Matched	.314	.4	17.184	43.842	.654 (.258)
Majority Christian	UnMatched	.553	.4	-30.6		1.496 (.138)
Majority Muslim	Matched	.371	.371	0	100	0 (.5)
Majority Muslim	UnMatched	.263	.371	23.167		-1.156 (.25)
Other Religion	Matched	.314	.229	-20.981	-93.22	-.705 (.758)
Other Religion	UnMatched	.184	.229	10.859		-.541 (.59)
Weighted distance (log)	Matched	9.391	9.334	-13.714	82.129	-1.022 (.844)
Weighted distance (log)	UnMatched	9.015	9.334	76.74		-3.353 (.001)
Real GDP (log)	Matched	7.035	7.083	5.364	94.87	.221 (.413)
Real GDP (log)	UnMatched	8.012	7.083	-104.555		5.002 (0)
Corruption	Matched	.289	.354	30.402	-9.498	1.16 (.126)
Corruption	UnMatched	.413	.354	-27.765		1.362 (.176)
Voice & Accountability	Matched	.305	.329	10.429	79.571	.41 (.342)
Voice & Accountability	UnMatched	.446	.329	-51.051		2.415 (.017)
Regulatory Quality	Matched	.228	.324	47.276	-20.719	2.058 (.022)
Regulatory Quality	UnMatched	.404	.324	-39.162		1.813 (.073)
Distance Squared (log)	Matched	88.228	87.186	-14.102	81.464	-1.009 (.841)
Distance Squared (log)	UnMatched	81.562	87.186	76.078		-3.339 (.001)
LI × Real GDP	Matched	3.715	3.142	-19.448	70.472	-.645 (.739)
LI × Real GDP	UnMatched	1.202	3.142	65.864		-3.384 (.001)
Model 3						
Agric land % of land area	Matched	.406	.472	32.603	36.116	1.09 (.14)
Agric land % of land area	UnMatched	.368	.472	51.035		-2.418 (.017)
landlocked	Matched	.486	.343	-34.261	32.384	-1.067 (.855)
landlocked	UnMatched	.132	.343	50.67		-2.653 (.009)
Low Income (LI)	Matched	.571	.486	-18.944	71.571	-.627 (.733)
Low Income (LI)	UnMatched	.184	.486	66.638		-3.432 (.001)
Lower Middle Income (LMI)	Matched	.314	.371	11.576	-15.152	.439 (.331)
Lower Middle Income (LMI)	UnMatched	.421	.371	-10.053		.491 (.625)
Upper Middle Income (UMI)	Matched	.114	.143	6.659	88.657	.311 (.378)
Upper Middle Income (UMI)	UnMatched	.395	.143	-58.707		2.717 (.008)
Majority Christian	Matched	.314	.4	17.184	43.842	.654 (.258)
Majority Christian	UnMatched	.553	.4	-30.6		1.496 (.138)

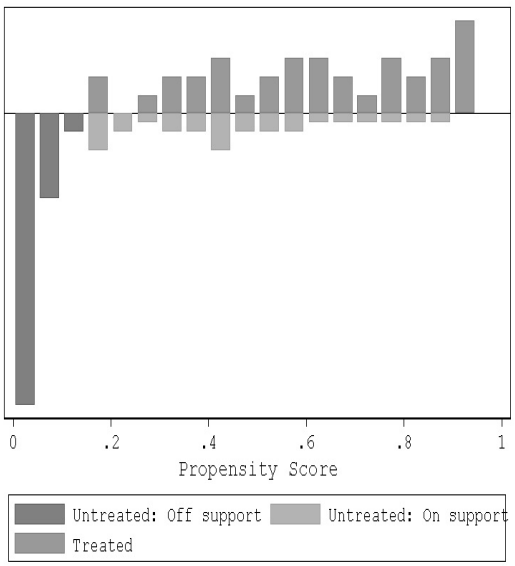
Majority Muslim	Matched	.371	.371	0	100	0 (.5)
Majority Muslim	UnMatched	.263	.371	23.167		-1.156 (.25)
Other Religion	Matched	.314	.229	-20.981	-93.22	-.705 (.758)
Other Religion	UnMatched	.184	.229	10.859		-.541 (.59)
Weighted distance (log)	Matched	9.391	9.334	-13.714	82.129	-1.022 (.844)
Weighted distance (log)	UnMatched	9.015	9.334	76.74		-3.353 (.001)
Real GDP (log)	Matched	7.035	7.083	5.364	94.87	.221 (.413)
Real GDP (log)	UnMatched	8.012	7.083	-104.555		5.002 (0)
Area (log)	Matched	12.108	12.36	10.752	78.856	.51 (.306)
Area (log)	UnMatched	11.169	12.36	50.849		-2.317 (.022)
Corruption	Matched	.289	.354	30.402	-9.498	1.16 (.126)
Corruption	UnMatched	.413	.354	-27.765		1.362 (.176)
Voice & Accountability	Matched	.305	.329	10.429	79.571	.41 (.342)
Voice & Accountability	UnMatched	.446	.329	-51.051		2.415 (.017)
Regulatory Quality	Matched	.228	.324	47.276	-20.719	2.058 (.022)
Regulatory Quality	UnMatched	.404	.324	-39.162		1.813 (.073)
Distance Squared (log)	Matched	88.228	87.186	-14.102	81.464	-1.009 (.841)
Distance Squared (log)	UnMatched	81.562	87.186	76.078		-3.339 (.001)
Model 4						
Agric land % of land area	Matched	.406	.472	32.603	36.116	1.09 (.14)
Agric land % of land area	UnMatched	.368	.472	51.035		-2.418 (.017)
landlocked	Matched	.486	.343	-34.261	32.384	-1.067 (.855)
landlocked	UnMatched	.132	.343	50.67		-2.653 (.009)
Low Income (LI)	Matched	.571	.486	-18.944	71.571	-.627 (.733)
Low Income (LI)	UnMatched	.184	.486	66.638		-3.432 (.001)
Lower Middle Income (LMI)	Matched	.314	.371	11.576	-15.152	.439 (.331)
Lower Middle Income (LMI)	UnMatched	.421	.371	-10.053		.491 (.625)
Upper Middle Income (UMI)	Matched	.114	.143	6.659	88.657	.311 (.378)
Upper Middle Income (UMI)	UnMatched	.395	.143	-58.707		2.717 (.008)
Majority Christian	Matched	.314	.4	17.184	43.842	.654 (.258)
Majority Christian	UnMatched	.553	.4	-30.6		1.496 (.138)
Majority Muslim	Matched	.371	.371	0	100	0 (.5)
Majority Muslim	UnMatched	.263	.371	23.167		-1.156 (.25)
Other Religion	Matched	.314	.229	-20.981	-93.22	-.705 (.758)
Other Religion	UnMatched	.184	.229	10.859		-.541 (.59)
Weighted distance (log)	Matched	9.391	9.334	-13.714	82.129	-1.022 (.844)
Weighted distance (log)	UnMatched	9.015	9.334	76.74		-3.353 (.001)
Real GDP (log)	Matched	7.035	7.083	5.364	94.87	.221 (.413)
Real GDP (log)	UnMatched	8.012	7.083	-104.555		5.002 (0)
Area (log)	Matched	12.108	12.36	10.752	78.856	.51 (.306)
Area (log)	UnMatched	11.169	12.36	50.849		-2.317 (.022)
Corruption	Matched	.289	.354	30.402	-9.498	1.16 (.126)
Corruption	UnMatched	.413	.354	-27.765		1.362 (.176)
Voice & Accountability	Matched	.305	.329	10.429	79.571	.41 (.342)
Voice & Accountability	UnMatched	.446	.329	-51.051		2.415 (.017)
Regulatory Quality	Matched	.228	.324	47.276	-20.719	2.058 (.022)
Regulatory Quality	UnMatched	.404	.324	-39.162		1.813 (.073)
Distance Squared (log)	Matched	88.228	87.186	-14.102	81.464	-1.009 (.841)
Distance Squared (log)	UnMatched	81.562	87.186	76.078		-3.339 (.001)

The bias and bias reductions are based on Rosenbaum and Rubin (1985). The standardised difference is calculated as $100(\bar{X}_T - \bar{X}_C)/\sqrt{(S_T^2 + S_C^2)/2}$, where $\bar{X}_T and \bar{X}_C$ are the sample means for each covariate in the treated (T) and control (C) groups, S are their respective sample variances. The sample percent bias reduction for covariate is $100 \times (1 - b_{match}/b_{pre})$, where b_{match} and b_{pre} are the treated and control post- and pre-match differences in means respectively.

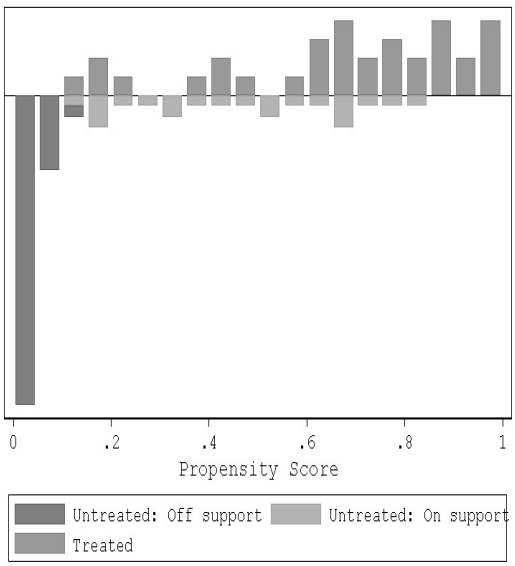


(a) Model 1

(b) Model 2



(c) Model 3



(d) Model 4

Figure 6: *Propensity score and region of common support*

4.2 Outcome in Levels and Shares

Tables (4–6) report the initial results for the various import regimes of the USA. The three regimes are the *no programme*, *gsp* and *non–gsp* regimes which are available to the developing countries in the dataset. The outcomes are presented in levels and in share of total imports by the USA from each country. The *no programme* item represents imports entering the USA that are not recorded under either the *gsp* or any other preference. These are mostly imports that enter the USA and receive the *most favoured nation (mfn)* treatment—(normal tariffs that apply to all World Trade Organisation (WTO) member countries.) For the remaining outcomes, *gsp* represents imports entering the USA that

had *gsp* tariffs applied on them, while *non-gsp* represents the residual which would be a proxy for the *agoa* imports of the treated. The three tables differ only in terms of the base propensity score model applied in matching. Tables (4), (5) and (6) are based on models 1, 2 and 3 respectively (see table 1).

The results for the levels in all three tables yield only a few significant estimates for *no programme* while tables (5 & 6) provide significant results for *non–gsp* imports in a few cases. The results for the shares fare much better than the levels. The *gsp* shares are not significant in any of the tables. Tables (4 & 6) have all *no programme* and *non–gsp* shares yielding highly significant estimates for the various matching estimators presented. The *no programme* share estimates for the kernel (bandwidth=0.005) and radius ($\delta = 0.01$) are no longer significant in table (5). The *ATT* estimates presented for the *no programme* and *non–gsp* shares are consistent in terms of their significance and signs across the matching estimators in each table as well as across the three tables (with two exceptions in table (5) where *no programme* shares are no longer significant but the signs remain the same). Differences in the estimates across tables is expected given that models 2 and 3 have more control and treated countries in the tails and gaps within the common support region. this would then create differences in the number of countries matched to the treated—this have an impact on the estimates. On the contrary, the estimates are relatively similar. For instance, the range of estimates across the estimators is 18.8% (kernel, bandwidth=0.005) – 20.2% (radius, $\delta = 0.01$) for *agoa* shares in table (4). That of table (5 & 6) are 13.7% (kernel, bandwidth=0.005) – 21.1% (radius, $\delta = 0.05$) and 14.% (kernel, bandwidth=0.01) – 20.6% (radius, $\delta = 0.005$) respectively. Similarly, the range for *no programme* shares are 20.7% (radius, $\delta = 0.05$) – 25% (kernel, bandwidth=0.005); 10.9% (kernel, bandwidth=0.01) – 20.6% (stratification); and 14.3% (kernel, bandwidth=0.01) – 20.2% (stratification) respectively. There are some differences for the levels for some estimates, however, these estimates are mostly not significant in all tables. The estimates presented in tables (5) and (6) are much closer to each other than they are to the estimates in table (4).

The results show that, on average and *ceteris paribus*, the shares of *agoa* imports by the USA from beneficiaries increased by about 13.7% – 21.1% relative to the control countries. Their *no programme* shares on the other hand, decreased by approximately 10.9% – 25% relative to the control countries, on average and *ceteris paribus*. The results are consistent with the empirical literature that point towards an increase in *agoa* exports. In terms of the levels, the cases that were significant are consistent with the results of the shares. On average and *ceteris paribus*, *no programme* import levels declined in all three tables by US$ 1,349 – 1,384 million (table 4); US$ 1,253 million (table 5) and US$ 1,284 – 3,358 million (table 6). The declines are relative to the control countries. On the contrary, *non–gsp* import levels increased on average and *ceteris paribus* by US$ 395 million (table 5) to US$ 418 million (table 6) relative to the control countries.

The decline in *no programme* levels are about 217% – 697% higher in magnitude

than the *non–gsp* level imports. The greater decline in *no programme* imports might indicate some marginal increases in the *gsp* shares. the *gsp* shares reported in the tables are positive in most cases with the maximum reported increase at 4.8%. The non significance of the *gsp* might there be be due to the strong decline in *no programme* levels which translated into higher *gsp* shares for the *agoa* beneficiaries relative to the control countries. The channel through which this occurs thereby presents the insignificant estimates (had there been a higher import level of *gsp* it might have translated into significant estimates). The results for the *non–gsp* shares (and by implication *agoa* for the beneficiaries) and *no programme* shares are beyond doubt and point towards a restructuring of exports of beneficiaries away from their *no programme* exports. At this point, not much can be said about whether overall exports to the USA by beneficiaries increased relative to the counter-factual. the next table would be useful in providing answers to this question. On a minor point, should the results point towards an increased in exports to the USA then an implication of the result would mean *gsp* shares must have gone up relative to the control. Another implication would be that there may be some differences in unobserved factors between the treated and control countries that are driving the insignificant results for the *gsp* levels and shares. This is however, doubtful at this point and the sensitivity analysis presented in section (4.6) some answers to the issue of the presence of unobserved factors.

Table (7) shows the results for mirror exports to the EU, USA and ROW. These are based on total exports to each destination. Again, results for the levels and shares are reported. The estimations, are restricted to propensity scores based on models 1 and 2. The reason being that, the propensity scores based on models 2 and 3 yielded very similar results and hence, focussing on models 1 and 2 in this section does not take anything away from the analysis.

The results for the levels yield one significant estimate for ROW under the stratification matching approach for both models. The estimated coefficient shows on average and *ceteris paribus*, that mirror exports to ROW declined between US$ 6,814 and US$ 7,887 million relative to the control. The mirror exports to the remaining destinations were not significant in any of the columns. The shares report more significant estimates compared to the levels. For the share of mirror exports to ROW, there was a decline ranging from 12.4% – 12.8% relative to the control countries, on average and *ceteris paribus*. The only other significant estimate is an increase in the share of mirror exports to the EU of 8.8% relative to the controls, on average and *ceteris paribus*.

Model 2 in the same table, shows higher estimates and the shares for EU and ROW are significant in all three columns. The share for the EU are 13.3% – 16.7% higher for the treated relative to the controls, holding all else constant. Consistent with the estimates based on model 1, the shares to ROW decline for the treated relative to the controls by 18.7% – 22.6%, on average and *ceteris paribus*. All results presented in this section so far, are consistent with the earlier propositions set in section (2.2.3). On the contrary, the results show that EU exports did not suffer as a result of the *agoa* preference—any

changes might be relative and marginal. Although, the estimated effect for the USA share is poistive, they are not significant and this is worrying. The level results are all negative, however, the estimates for ROW and EU are much larger compared to the USA levels. This does not present much of a problem. The relative level of the declines are responsible for the positive increase in shares reported for the EU. The ROW levels are in most cases 2.8 – 3.3 times the value of the EU estimates. Given this, one would have expected a significant and positive estimate for the USA shares. The non significance might there be attributable to the presence of unobserved factors that might have explained away the effect.

One point of note is that, the two sources of data used for the USA level outcome yield similar estimates. Thus, any problems arising from the data source can be discounted. This in itself yields a robustness check of the main USA outcome variable obtained from the US International Trade Centre. In addition, although the presence of unobserved factors are suspected, the fact that the estimated *ATT* is not zero in value leads one to place a lower emphasis on unobserved factors as a major problem here.

The remaining analysis in this section and the next sections (4.3 – 4.6) are an attempt to use other methods, outcome variables and sensitivity analysis to check the robustness of the results presented here. In addition, it is to verify whether the results that were not significant improve. Nevertheless, it would allow for the significant results that remain significant to show that the effects reported are beyond doubt. The discussion of the results based on covariate matching is presented next.

Table 4: Cross-Section Estimates (Model 1)

Matching Type	Outcome	No. Contr.	No. Treat	ATT Est.	Std. Error	T-stat
Outcome in Levels						
Kernel–bw=0.06	No programme (MFN tariff)	40	35	-1349162496.00	861946225.31	-1.565
Kernel–bw=0.06	GSP Preference	40	35	-66442312.00	142035881.78	-.468
Kernel–bw=0.06	Non–GSP Preference	40	35	392376832.00	312524273.13	1.256
Kernel–bw=0.01	No programme (MFN tariff)	40	35	-639962240.00	1007778274.14	-.635
Kernel–bw=0.01	GSP Preference	40	35	-4960465.50	228553545.77	-.022
Kernel–bw=0.01	Non–GSP Preference	40	35	601407552.00	468640451.92	1.283
Kernel–bw=0.005	No programme (MFN tariff)	40	35	-172533392.00	1419980284.80	-.122
Kernel–bw=0.005	GSP Preference	40	35	20342028.00	429618054.83	.047
Kernel–bw=0.005	Non–GSP Preference	40	35	808071872.00	895763433.14	.902
Stratification	No programme (MFN tariff)	40	35	-1384507520.00	994934462.78	-1.392
Stratification	GSP Preference	40	35	-147136608.00	225022794.88	-.654
Stratification	Non–GSP Preference	40	35	396514464.00	312551905.55	1.269
Radius–0.05	No programme (MFN tariff)	40	35	-963799622.85	824879821.12	-1.168
Radius–0.05	GSP Preference	35	35	32994945.21	104546135.11	.316
Radius–0.05	Non–GSP Preference	40	35	395611503.80	336369150.44	1.176
Radius–0.01	No programme (MFN tariff)	40	35	-664691229.78	931259662.82	-.714
Radius–0.01	GSP Preference	35	35	-48386735.76	232331604.45	-.208
Radius–0.01	Non–GSP Preference	40	35	573861309.95	538114133.05	1.066
Country's Share in total USA imports						
Kernel–bw=0.06	No programme (MFN tariff)	40	35	-.215	.046	-4.645
Kernel–bw=0.06	GSP Preference	40	35	.014	.032	.440
Kernel–bw=0.06	Non–GSP Preference	40	35	.192	.041	4.72
Kernel–bw=0.01	No programme (MFN tariff)	40	35	-.246	.078	-3.142
Kernel–bw=0.01	GSP Preference	40	35	.037	.058	.638
Kernel–bw=0.01	Non–GSP Preference	40	35	.190	.058	3.254
Kernel–bw=0.005	No programme (MFN tariff)	40	35	-.250	.128	-1.946
Kernel–bw=0.005	GSP Preference	40	35	.048	.086	.557
Kernel–bw=0.005	Non–GSP Preference	40	35	.188	.100	1.890
Stratification	No programme (MFN tariff)	40	35	-.213	.052	-4.114
Stratification	GSP Preference	40	35	.0067	.034	.196
Stratification	Non–GSP Preference	40	35	.195	.041	4.810
Radius–0.05	No programme (MFN tariff)	40	35	-.208	.056	-3.714
Radius–0.05	GSP Preference	35	35	.007	.042	.167
Radius–0.05	Non–GSP Preference	40	35	.187	.045	4.156
Radius–0.01	No programme (MFN tariff)	40	35	-.249	.077	-3.234
Radius–0.01	GSP Preference	35	35	.017	.057	.298
Radius–0.01	Non–GSP Preference	40	35	.202	.058	3.483

All standard errors bootstrapped with 250 replications. For the radius estimates Z values are reported instead of T-statistics. Critical values $Z(\alpha = 0.05) = 1.96$; $Z(\alpha = 0.1) = 1.64$; $t_{60,0.1} = 1.296$; $t_{60,0.05} = 1.671$; $t_{75,0.1} = 1.293$; $t_{75,0.05} = 1.666$. Covariates used in matching include proxies for governance (corruption), economic structure, gravity type variables

Table 5: Cross-Section Estimates–Level Imports (Model 2)

Matching Type	**Outcome**	**No. Contr.**	**No. Treat**	**ATT Est.**	**Std. Error**	**T-stat**
Outcome in Levels						
Kernel–bw=0.06	No programme (MFN tariff)	26	35	-1253373952.00	893357213.03	-1.403
Kernel–bw=0.06	GSP Preference	26	35	-200394688.00	199274355.28	-1.006
Kernel–bw=0.06	Non–GSP Preference	26	35	413053184.00	314779296.65	1.312
Kernel–bw=0.01	No programme (MFN tariff)	26	35	-2620337152.00	2450153227.97	-1.069
Kernel–bw=0.01	GSP Preference	26	35	-318943136.00	578883183.67	-.551
Kernel–bw=0.01	Non–GSP Preference	26	35	142069088.00	317803029.63	.447
Kernel–bw=0.005	No programme (MFN tariff)	26	35	-2734660608.00	2352334630.07	-1.163
Kernel–bw=0.005	GSP Preference	26	35	-565035904.00	499041958.20	-1.132
Kernel–bw=0.005	Non–GSP Preference	26	35	-134012400.00	230289891.18	-.582
Stratification	No programme (MFN tariff)	26	35	-1511461120.00	1148903128.40	-1.316
Stratification	GSP Preference	26	35	-214117248.00	219969658.24	-.973
Stratification	Non–GSP Preference	26	35	395676512.00	272240318.37	1.453
Radius–0.05	No programme (MFN tariff)	26	35	-1517723016.84	1214664025.91	-1.25
Radius–0.05	GSP Preference	24	35	-207928134.87	241181176.03	-.862
Radius–0.05	Non–GSP Preference	26	35	341247932.11	349208851.81	.977
Radius–0.01	No programme (MFN tariff)	26	35	-2404234594.02	2135859647.20	-1.126
Radius–0.01	GSP Preference	24	35	-275557298.70	541158902.17	-.509
Radius–0.01	Non–GSP Preference	26	35	117560935.79	296438970.97	.397
Country's Share in total USA imports						
Kernel–bandwidth=0.06	No programme (MFN tariff)	26	35	-.175	.086	-2.047
Kernel–bandwidth=0.06	GSP Preference	26	35	-.033	.064	-.509
Kernel–bandwidth=0.06	Non–GSP Preference	26	35	.203	.042	4.827
Kernel–bandwidth=0.01	No programme (MFN tariff)	26	35	-.155	.098	-1.581
Kernel–bandwidth=0.01	GSP Preference	26	35	.007	.081	.09
Kernel–bandwidth=0.01	Non–GSP Preference	26	35	.146	.072	2.032
Kernel–bandwidth=0.005	No programme (MFN tariff)	26	35	-.109	.104	-1.056
Kernel–bandwidth=0.005	GSP Preference	26	35	-.032	.081	-.393
Kernel–bandwidth=0.005	Non–GSP Preference	26	35	.137	.08	1.711
Stratification	No programme (MFN tariff)	26	35	-.206	.062	-3.298
Stratification	GSP Preference	26	35	.0018	.039	.047
Stratification	Non–GSP Preference	26	35	.200	.045	4.426
Radius–0.05	No programme (MFN tariff)	26	35	-.197	.078	-2.526
Radius–0.05	GSP Preference	24	35	-.014	.055	-.255
Radius–0.05	Non–GSP Preference	26	35	.211	.051	4.137
Radius–0.01	No programme (MFN tariff)	26	35	-.146	.097	-1.505
Radius–0.01	GSP Preference	24	35	.016	.081	.198
Radius–0.01	Non–GSP Preference	26	35	.145	.072	2.014

All standard errors bootstrapped with 250 replications. For the radius estimates Z values are reported instead of T-statistics. Critical values $Z(\alpha = 0.05) = 1.96$; $Z(\alpha = 0.1) = 1.64$; $t_{60,0.1} = 1.296$; $t_{60,0.05} = 1.671$; $t_{75,0.1} = 1.293$; $t_{75,0.05} = 1.666$. Covariates used in matching include proxies for governance (corruption), economic structure, gravity type variables

Table 6: Cross-Section Estimates–Levels (Model 3)

Matching Type	Outcome	No. Contr.	No. Treat	ATT Est.	Std. Error	T-stat
Outcome in Levels						
Kernel–bw=0.06	No programme (MFN tariff)	27	35	-1284815616.00	857828362.93	-1.498
Kernel–bw=0.06	GSP Preference	27	35	-195441104.00	192819724.62	-1.014
Kernel–bw=0.06	Non–GSP Preference	27	35	418223872.00	298376258.58	1.402
Kernel–bw=0.01	No programme (MFN tariff)	27	35	-3150746368.00	2081949562.55	-1.513
Kernel–bw=0.01	GSP Preference	27	35	-571329792.00	502442486.46	-1.137
Kernel–bw=0.01	Non–GSP Preference	27	35	-125417368.00	168687287.85	-.743
Kernel–bw=0.005	No programme (MFN tariff)	27	35	-2188557056.00	2819673251.68	-.776
Kernel–bw=0.005	GSP Preference	27	35	-582676736.00	622929534.17	-.935
Kernel–bw=0.005	Non–GSP Preference	27	35	43588328.00	126195746.81	.345
Stratification	No programme (MFN tariff)	27	35	-1069254912.00	988352857.52	-1.082
Stratification	GSP Preference	27	35	-146493936.00	198938977.95	-.736
Stratification	Non–GSP Preference	27	35	415805888.00	287932620.99	1.444
Radius–0.05	No programme (MFN tariff)	27	35	-1293825193.00	1057511850.46	-1.223
Radius–0.05	GSP Preference	25	35	-172692903.98	229076999.06	-.754
Radius–0.05	Non–GSP Preference	27	35	358852934.77	363761861.78	.99
Radius–0.01	No programme (MFN tariff)	27	35	-3358353353.22	1911908368.43	-1.757
Radius–0.01	GSP Preference	25	35	-597451014.92	463326272.86	-1.289
Radius–0.01	Non–GSP Preference	27	35	-108282609.67	211904725.63	-.511
Country's Share in total USA imports						
Kernel–bandwidth=0.06	No programme (MFN tariff)	27	35	-.170	.082	-2.078
Kernel–bandwidth=0.06	GSP Preference	27	35	-.038	.075	-.51
Kernel–bandwidth=0.06	Non–GSP Preference	27	35	.203	.043	4.675
Kernel–bandwidth=0.01	No programme (MFN tariff)	27	35	-.143	.091	-1.569
Kernel–bandwidth=0.01	GSP Preference	27	35	-.029	.037	-.788
Kernel–bandwidth=0.01	Non–GSP Preference	27	35	.142	.073	1.942
Kernel–bandwidth=0.005	No programme (MFN tariff)	27	35	-.188	.116	-1.619
Kernel–bandwidth=0.005	GSP Preference	27	35	-.060	.058	-1.031
Kernel–bandwidth=0.005	Non–GSP Preference	27	35	.187	.07	2.651
Stratification	No programme (MFN tariff)	27	35	-.202	.067	-3.015
Stratification	GSP Preference	27	35	-.004	.046	-.094
Stratification	Non–GSP Preference	27	35	.202	.051	3.964
Radius–0.05	No programme (MFN tariff)	27	35	-.2	.065	-3.077
Radius–0.05	GSP Preference	25	35	-.005	.05	-.1
Radius–0.05	Non–GSP Preference	27	35	.206	.051	4.039
Radius–0.01	No programme (MFN tariff)	27	35	-.148	.086	-1.721
Radius–0.01	GSP Preference	25	35	-.036	.036	-1
Radius–0.01	Non–GSP Preference	27	35	.147	.07	2.1

All standard errors bootstrapped with 250 replications. For the radius estimates Z values are reported instead of T-statistics. Critical values $Z(\alpha = 0.05) = 1.96$; $Z(\alpha = 0.1) = 1.64$; $t_{60,0.1} = 1.296$; $t_{60,0.05} = 1.671$; $t_{75,0.1} = 1.293$; $t_{75,0.05} = 1.666$. Covariates used in matching include proxies for governance (corruption), economic structure, gravity type variables

Table 7: Cross-section results for Mirror Exports to the EU, USA, ROW (Models 1 & 2)

Variable	N [NT (NC)]	Kernal (bw=0.06)	Radius ($\delta = 0.05$)	Stratification
Model 1—Total Mirror Exports in Levels				
EU	75 [35 (40)]	-1.481e+09 (1.282e+09) [-1.155]	-1.356e+09 (1.272e+09) [-1.066]	-2.189e+09 (1.749e+09) [-1.252]
USA	75 [35 (40)]	-5.928e+08 (1.083e+09) [-.547]	-5.550e+08 (1.096e+09) [-.506]	-1.157e+09 (1.278e+09) [-.905]
ROW	75 [35 (40)]	-4.848e+09 (3.007e+09) [-1.612]	-4.690e+09 (3.218e+09) [-1.458]	-6.814e+09 (4.109e+09) [-1.658]
USA Imports	75 [35 (40)]	-5.446e+08 (1.043e+09) [-.522]	-5.107e+08 (1.061e+09) [-.481]	-1.093e+09 (1.232e+09) [-.887]
Model 1—Mirror Exports, Shares				
EU	75 [35 (40)]	.09 (.062) [1.447]	.094 (.063) [1.495]	.088 (.067) [1.3148]
USA	75 [35 (40)]	.033 (.042) [.792]	.034 (.043) [.799]	.038 (.044) [.8702]
ROW	75 [35 (40)]	-.124 (.065) [-1.896]	-.128 (.066) [-1.944]	-.127 (.069) [-1.825]
Model 2—Total Mirror Exports in Levels				
EU	61 [35 (26)]	-1.701e+09 (1.803e+09) [-.943]	-1.906e+09 (1.902e+09) [-1.002]	-1.951e+09 (1.665e+09) [-1.171]
USA	61 [35 (26)]	-1.325e+09 (1.584e+09) [-.836]	-1.415e+09 (1.641e+09) [-.862]	-1.355e+09 (1.442e+09) [-.94]
ROW	61 [35 (26)]	-7.971e+09 (5.956e+09) [-1.338]	-8.452e+09 (6.064e+09) [-1.394]	-7.887e+09 (4.662e+09) [-1.692]
USA, USITC	61 [35 (26)]	-1.267e+09 (1.535e+09) [-.825]	-1.350e+09 (1.590e+09) [-.849]	-1.294e+09 (1.392e+09) [-.93]
Model 2—Mirror Exports, Shares				
EU	61 [35 (26)]	.133 (.063) [2.123]	.138 (.057) [2.41]	.167 (.063) [2.6433]
USA	61 [35 (26)]	.054 (.042) [1.268]	.052 (.045) [1.16]	.059 (.046) [1.275]
ROW	61 [35 (26)]	-.187 (.081) [-2.314]	-.19 (.075) [-2.52]	-.226 (.08) [-2.8436]

Standard errors in brackets, Z values reported for the Kernel and Radius estimates and T-statistics reported for the Stratification estimates (these are reported in square brackets). All standard errors bootstrapped with 250 replications. Critical values $Z(\alpha = 0.05) = 1.96$; $Z(\alpha = 0.1) = 1.64$; $t_{60,0.1} = 1.296$; $t_{60,0.05} = 1.671$; $t_{75,0.1} = 1.293$; $t_{75,0.05} = 1.666$. Outcome variables EU, USA and ROW are obtained from UN Comtrade (WITS) database. The Level variable USA–USITC is obtained from the USITC database. Covariates used in matching include proxies for governance (corruption), economic structure, gravity type variables.

In addition, to the propensity score matching carried out above, the nearest neighbour matching based on Abadie and Imbens (2002, 2011) and Abadie et al. (2001) is shown in Tables (8 - 10). The results are not very different from those presented in Table (4). Each of the three tables (Tables 8 - 10) show two sets of results. The first set replicates the results of the propensity score matching results provided under model 1. While the second set of results incorporates additional covariates (three additional covariates—physical capital per worker, land per worker and human capital). In a few of the cases the *ATT* estimate becomes significant. The differences across the three tables relate to the modelling of the *ATT* estimate. For all three tables the matching covariates are used in adjusting any resulting bias in the *ATT* estimate. Tables (9 & 10) both use an exact matching procedure via the Mahalanobis metric using the low income, lower middle income, majority christian and majority muslim dummies. Table (10) in addition to the Mahalanobis metric adjusts for heteroscedasticity and heterogeneity in the treatment. Do these results provide any further insight or support the earlier results? Even though there are slight differences, in most cases the signs are the same and it does provide support for the earlier results. The differences in the size of the adjustments are due to the slightly different algorithms used and the sample sizes. These tables use a much larger number of controls and thus the sample *ATT* are different in some of the cases compared to Table (4). Taking into account these differences, does provide support for the earlier results. Now returning to the differences in the three tables (Tables 8, 9 & 10) it is useful to observe that apart from a handful of cases the estimates are quite similar. The estimates for Tables (9 & 10) are the same since the algorithm does not affect the *ATT* estimate but adjusts the standard error for heteroscedasticity. After, adjusting the standard errors for heteroscedasticity large increases in the Z-values are observed for the second set of results with the additional covariates. On the other hand, the first set of results do not show such large increases in the Z-values.

To summarise, the evidence from the three tables are not that different from from those already presented. The levels of the variables are insignificant in the first set of results and are mixed in the second set in each table. Again, among the first set of results preferential import shares are significantly higher for beneficiaries, ceteris paribus. The *no programme* shares are significantly lower in majority of the cases. The *gsp* shares on the other hand are insignificant in all first set of results in the three tables. The shares for the mirror exports to the EU, USA and ROW on the other are not significant in all three tables for the first set of results. The levels of mirror exports to the USA–UN Comtrade (and USA–USITC), EU and ROW are insignificant in all three tables for the first set. On the contrary, the levels of *no programme* and *preferential* imports are significant in the first column of Table (10) while *gsp* is not significant in any of the three tables in the first column.

For the second set of results, there are some changes in the significance for some of the first set of results. One has to be careful of the Z-values reported for the additional covariates in Table (10). These Z-values are astronomically larger than before and occur mostly where there was no significance earlier. For example, the *gsp* shares and levels become significant in all three tables (with the exception of the *gsp* share in Table (8). In addition, the levels of the mirror exports are not significant in all the first two tables but do become significant in Table (10). Moreover, the shares of mirror exports become significant for the EU in all three tables while it is significant for the USA in Table (10). Last but not the least, the shares for ROW is significant in Table (9). Finally, the Z-values have increased by more than 10 fold in some cases. The increase in Z-values are much less for the shares compared to the levels. The poor performance of the levels in the first set of results might account for these increases. This might also be due to unobserved factors that affect the level but not the shares of the outcome variables. Another reason, might be that there is a significant problem of heteroscedasticity in the level data—given that the data is spatially distributed and the beneficiaries are heterogeneous in their export levels to the USA.

Table 8: Nearest Neighbour matching based on Abadie and Imbens (2011) & Abadie et al.'s (2001)

	Covariates based on Model 1[a]				With additional covariates[b]			
Outcome	N	SATT	Std. Error	Z-value	N	SATT	Std. Error	Z-Value
Imports in Levels								
No Programme	124	-1309903495.31	1432430690.45	-.914	85	-25882923072	18815472175.4	-1.376
GSP Preferences	107	-315413537.16	293216986.78	-1.076	74	-6089381653.33	2065856642.65	-2.948
Non–GSP Preferences	124	463351911.67	370168829.94	1.252	85	123751201.01	52565301.27	2.354
Import Shares								
No program	124	-.192	.066	-2.909	85	-.365	.138	-2.645
GSP Preferences	107	-.019	.05	-.38	74	-.2	.311	-.643
Non–GSP Preferences	124	.196	.058	3.379	85	.277	.072	3.847
Mirror Exports in Levels								
EU	124	-808144579.20	1299563442.21	-.622	85	-32911056392	22932237521.4	-1.435
USA–UN Comtrade	124	-1142069804.80	1891425684.12	-.604	85	-28822828584	20769195815.78	-1.388
USA–USITC	124	-1105849230.63	1834878081.05	-.603	85	-28213371226.67	20394823698.29	-1.383
ROW	124	-8710094314.06	7163662602.28	-1.216	85	-99458835010.67	75939560104.41	-1.31
Share of Mirror Exports								
EU	124	.012	.071	.169	85	.46	.215	2.14
USA-UN Comtrade	124	.085	.064	1.328	85	.021	.071	.296
ROW	124	-.097	.076	-1.276	85	-.481	.254	-1.894

Critical values $Z(\alpha = 0.05) = 1.96$; $Z(\alpha = 0.1) = 1.64$. Matching Variables: landlocked, LI, LMI, Majority Christian, Majority Muslim Distance (Weighted, in logs), Real GDP (logs), Distance squared, Real GDP squared, LI × Real GDP, LMI × Real GDP, UMI × Real GDP. Bias-adj Variables: landlocked, LI, LMI, Majority Christian, Majority Muslim Distance (Weighted, in logs), Real GDP (logs), Distance squared, Real GDP squared, LI × Real GDP, LMI × Real GDP, UMI × Real GDP. [a] Covariates used in estimating propensity score model 1 are used here for comparison. The no. treated is 35, controls is 89; [b] Additional covariates — land and capital per worker as well as human capital are included and are also included in the bias–adjustment. The no. treated is 24, controls is 61

Table 9: Exact Nearest Neighbour matching based on Abadie and Imbens (2011) & Abadie et al.'s (2001) Mahalanobis metric

	Covariates based on Model 1[a]				With additional covariates[b]			
Outcome	N	SATT	Std. Error	Z-value	N	SATT	Std. Error	Z-Value
Imports in Levels								
No Programme	124	-1383519630.63	1406286367.77	-.984	85	-30008790707.50	20516215156.51	-1.463
GSP Preferences	107	-318564636.11	286293803.19	-1.113	74	-6265815473.33	3089757132.06	-2.028
Non–GSP Preferences	124	463022147.24	370145260.79	1.251	85	94974882.54	54396084.11	1.746
Import Shares								
No program	124	-.189	.066	-2.864	85	-.193	.078	-2.474
GSP Preferences	107	-.02	.051	-.392	74	-.203	.095	-2.137
Non–GSP Preferences	124	.197	.059	3.339	85	.262	.078	3.359
Mirror Exports in Levels								
EU	124	-875510493.71	1279498078.93	-.684	85	-44878021386.67	31930887146.14	-1.405
USA–UN Comtrade	124	-1219358141.26	1860734265.85	-.655	85	-34438102120.33	23851234386.94	-1.444
USA–USITC	124	-1177128155.43	1805135140.51	-.652	85	-33313150246.67	23155377075.03	-1.439
ROW	124	-8862764382.17	7012019042.90	-1.264	85	-102725023114.67	72586518977.41	-1.415
Share of Mirror Exports								
EU	124	.019	.069	.275	85	.353	.163	2.166
USA-UN Comtrade	124	.081	.061	1.328	85	-.375	.358	-1.047
ROW	124	-.1	.078	-1.282	85	.023	.338	.068

Critical values $Z(\alpha = 0.05) = 1.96$; $Z(\alpha = 0.1) = 1.64$. Matching Variables: landlocked, LI, LMI, Majority Christian, Majority Muslim Distance (Weighted, in logs), Real GDP (logs), Distance squared, Real GDP squared, LI × Real GDP, LMI × Real GDP, UMI × Real GDP. Bias-adj Variables: landlocked, LI, LMI, Majority Christian, Majority Muslim Distance (Weighted, in logs), Real GDP (logs), Distance squared, Real GDP squared, LI × Real GDP, LMI × Real GDP, UMI × Real GDP. Exact matching done on LI, LMI, Majority Christian and Majority Muslim. [a] Covariates used in estimating propensity score model 1 are used here for comparison. The no. treated is 35, controls is 89; [b] Additional covariates — land and capital per worker as well as human capital are included and are also included in the bias–adjustment. The no. treated is 24, controls is 61

Table 10: Exact Nearest Neighbour matching based on Abadie and Imbens (2011) & Abadie et al.'s (2001) Mahalanobis metric with heteroscedastic robust standard errors

	Covariates based on Model 1[a]				With additional covariates[b]			
Outcome	N	SATT	Std. Error	Z-value	N	SATT	Std. Error	Z-Value
Imports in Levels								
No Programme	124	-1383519630.63	826180404.76	-1.675	85	-30008790707.50	1526213084.26	-19.662
GSP Preferences	107	-318564636.11	164894258.68	-1.932	74	-6265815473.33	225918881.93	-27.735
Non–GSP Preferences	124	463022147.24	295556432.64	1.567	85	94974882.54	41738645.09	2.275
Import Shares								
No program	124	-.189	.036	-5.25	85	-.193	.039	-4.949
GSP Preferences	107	-.02	.032	-.625	74	-.203	.03	-6.767
Non–GSP Preferences	124	.197	.034	5.794	85	.262	.044	5.955
Mirror Exports in Levels								
EU	124	-875510493.71	1322960115.95	-.662	85	-44878021386.67	2557840431.44	-17.545
USA–UN Comtrade	124	-1219358141.26	1135439134.53	-1.074	85	-34438102120.33	1792193387.65	-19.216
USA–USITC	124	-1177128155.43	1099434047.89	-1.071	85	-33313150246.67	1748665147.41	-19.051
ROW	124	-8862764382.17	4028653655.83	-2.2	85	-102725023114.67	6595064059.91	-15.576
Share of Mirror Exports								
EU	124	.019	.047	.404	85	.353	.055	6.418
USA-UN Comtrade	124	.081	.054	1.5	85	-.375	.045	-8.333
ROW	124	-.1	.071	-1.408	85	.023	.075	.307

Critical values $Z(\alpha = 0.05) = 1.96$; $Z(\alpha = 0.1) = 1.64$. Matching Variables: landlocked, LI, LMI, Majority Christian, Majority Muslim Distance (Weighted, in logs), Real GDP (logs), Distance squared, Real GDP squared, LI × Real GDP, LMI × Real GDP, UMI × Real GDP. Bias-adj Variables: landlocked, LI, LMI, Majority Christian, Majority Muslim Distance (Weighted, in logs), Real GDP (logs), Distance squared, Real GDP squared, LI × Real GDP, LMI × Real GDP, UMI × Real GDP. Exact matching done on LI, LMI, Majority Christian and Majority Muslim. [a] Covariates used in estimating propensity score model 1 are used here for comparison. The no. treated is 35, controls is 89; [b] Additional covariates — land and capital per worker as well as human capital are included and are also included in the bias–adjustment. The no. treated is 24, controls is 61

The summary of the results presented in this section is that, firstly, *agoa* beneficiaries had higher shares of preferential exports relative to the counter-factual set of countries with preferential exports to the USA. Secondly, a larger decline in *no programme* exports share is observed for *agoa* beneficiaries relative to the counter-factual countries. Thirdly, in the case of the *gsp* shares no significant changes are observed an indication that majority of the change in *agoa* shares were mostly obtained from the *no programme* shares. Moving on to the shares of mirror exports, an increase is observed for *agoa* beneficiaries relative to the counter-factual exports to the EU only after including additional covariates in the *Mahalanobis* nearest neighbour matching. Turning now to the levels, the *no programme* and *gsp* decrease relative to the counter-factual. On the contrary *agoa* exports increase relative to the counter-factual. The same cannot be said of the levels for the mirror exports to the USA, EU and ROW—these are insignificant and do not provide much information about the performance relative to the counter-factual countries.

Answering the following questions summarises and puts forward the implications of the results presented in this section.

- **Do the *nearest neighbour Mahalanobis* matching invalidate the earlier results obtained by the propensity score matching?** They do not invalidate the results. As explained earlier the differences in algorithms and size of controls used in matching has led to variations in *ATT* estimates. Most importantly, the signs and significance levels are similar for the first set of results which are an attempt to replicate the propensity score matching results of model 1.
- **Should one be worried about the variation in *ATT*?** The various algorithms and matching types do provide different estimates. What one needs to keep an eye on is, whether there are very different results across the various matching estimates.

As long as the results have the same signs and do not vary from significantly negative to significantly positive estimates—there should be no need to lose faith in the results.

- **Are the results robust enough?** The results have been consistent across the various tables for the *no programme* and *preferential* shares and thus these results are robust enough. The remaining results vary in significance across the tables. In a way some of these are consistently not significant. These insignificant *ATT* outcome estimates imply that, there are no differences between the *agoa* beneficiaries and the counter-factual countries. Thus, there is essentially no difference between the treated and control countries in terms of these outcome variables.
- **What are the implications of the results?** *Agoa* beneficiaries have definitely observed an increase in their share of *agoa* exports to the USA and a definite decrease in their share of *no programme* exports. The *gsp* shares have stayed relatively at the same levels. The shares of exports to the EU and the USA (in some cases) have gone up for the beneficiaries relative to the counter-factual. That of exports to the ROW has decreased relative to the counter-factual On the contrary, the levels do not provide any clear answers to what has happened to the level of exports to *EU, USA* and *ROW*. On the few occasions, significant estimates are observed for these outcomes—they point to an increase in exports to the EU and a decrease in exports to ROW by beneficiaries relative to the counter-factual. On the contrary, *no programme* exports have decreased while *agoa* exports have increased relative to the counter-factual.

The following conclusion can be drawn from the preceding.

- Export shares for *agoa* has risen while that of *no programme* has decreased
- Export shares for both the USA and EU have also gone up while shares for ROW has gone down.
- The level exports for *agoa* has increase while that of *no programme* exports has decreased.

This leads to the conclusion that the *agoa* preference has not hurt exports of beneficiaries to the EU. Rather, the exports of beneficiaries to the rest of the world has been hit harder by the *agoa* preference. A reason for the EU exports maintaining its share of beneficiary exports is due to the competing preferences offered by the EU. The remaining countries within ROW do not offer preferences beyond the *gsp*. Nonetheless, Canada, Japan and Australia are not major export destinations of the beneficiary countries although they also offer the *gsp* preference to SSA. The main changes in *agoa* exports have been due to compositional changes in exports and a slight increase in overall exports to the USA. The next section discusses the results of the disaggregated mirror exports.

4.3 Disaggregated Mirror exports to the USA, EU and ROW

The table in this section reports results for disaggregated exports to the USA, EU and ROW. The disaggregation is based on Hanson (2010) who suggests using eight sectors. The sectors are

- Agriculture, meat and dairy, seafood—HS 01–10 & 12–14
- Food, beverages, tobacco, wood, paper—HS 11, 15–24, 44–48
- Extractive industries—HS 25–27 & 68–71
- Chemicals, plastics, rubber—28–36 38–40
- Textiles, apparel, leather, footwear—HS 41–42 & 50–65
- Iron, steel, and other metals—HS 26, 72–83
- Machinery, electronics, transportation equipment—84–89
- Other industries—HS 37, 43, 49, 66–67 & 90–97.

The justification for the disaggregation is based on the similarities among the industries within each sector above (Hanson, 2010). Hanson (2010) also notes that, the factor intensities, technology and institutional foundations behind production are likely to be similar for each group (Hanson, 2010, 8). It is on this basis that, the choice of disaggregation is chosen. this would allow a better comparison among the treated and control countries. Tables (11–12) present results for the shares and levels of the disaggregated mirror exports respectively.

The results in table (11) shows very poorly determined results for the kernel (with bandwith=0.001). Only the first *ATT* estimate in this column is significant at the 10% level of significance. The *ATT* estimates for mirror export shares to the USA under extractive and other industries are significant in all remaining columns. The *ATT* estimates for the EU shares under the iron, steel and other metals product group is also signifcant in all columns except for the kernel (bandwidth=0.001). On average and *ceteris paribus agoa* beneficiaries increased their share of mirror exports to the USA for extractive industries between 6.4% and 8.7% compared to the control group of countries. On the contrary, their mirror export shares to the USA for other industries reveal a decline of 0.21% and 0.29%.

On average and *ceteris paribus* relative to the control countries in terms of mirror exports to the EU, there is an increase in the share of iron, steel and other metal products of 3.99% – 5.9%. Additionally, a couple of significant *ATT* estimates are observed under the stratification and radius matching columns. In terms of food, beverages, tobacco, wood and paper product group, radius ($\delta = 0.05$) and kernel (bandwidth=0.01) indicate a significant increase of 6.2% relative to the control.

On the contrary, under stratification matching, the mirror export shares to ROW declines relative to the control significantly (4.3%). There are marginal increases for the USA in iron, steel and other metals relative to the control—this is significant under stratification matching. Last but not the least, mirror export shares to ROW decline

significantly relative to the control for machinery, electronics, and transport equipment products (2.6%–3.1% in the first and last two columns) and other industries (0.71% in the last column).

The result for textiles, apparel, leather and footwear product shares are not significant in any of the columns contrary to the positive impact reported in the empirical literature (for example, Collier and Venables, 2007). To investigate this further, table (25) in the appendix does a breakdown of the *ATT* for apparel and textile products (excluding leather and footwear) and all non apparel and textile products. Again, apparel and tetile shares are all not significant. However, the share of non apparel and textile products have increased for the *agoa* beneficiaries relative to the control countries for the EU (11.9%–12.8%) and the USA (5.8%–6.3%) respectively, on average and *ceteris paribus*. The estimates are significant at the 5% level of significance. The shares to ROW on the other hand, decreased relative to the control countries by 12.1% – 12.7% on average and *ceteris paribus*. The level outcomes in the table, on the contrary present a statistically significant decrease in mirror exports to all three destinations relative to the control countries for apparel and textile products, *ceteris paribus*. That of non apparel and textile products are insignificant for the level outcomes. The decrease is less than US$ 600 million for the kernel and radius matching estimates. On the other hand, the stratification matching estimates are approximately US$ 200–290 million more than the kernel and radius estimates.

The final table in this section, table (12) presents the results for the level outcomes. The extractive industries and the iron, steel and other metals sub-sectors do not report any significant estimates as their counterparts in the previous table did. Also, the kernel and radius estimates perform poorly and do not report significant *ATT* estimates except for mirror exports to the USA and ROW of agriculture, meat, diary and seafood sector and mirror exports to the USA for other industries. For all the cases where the stratification estimates are significant, the significant kernel/radius estimates reported are smaller than the stratification estimates in absolute value—ranging from US$ 20–US$ 230 million.

The result for the USA for other industries is similar in sign and significance to that obtained for the shares. The decline in shares is supported by a decline in the level outcomes relative to the control of US$ 100 – 120 million, *ceteris paribus*. The remaining significant outcomes for the shares, that is extractive industries (USA) and iron, steel and other metals (EU) are no longer significant for the levels. However, to the extent that they are not significant and the magnitude of the variables are smaller, they do not imply an exaggeration of the earlier result for the shares. The decline in the mirror exports for the extractive industry is less than US$ 16 million for the USA while that of iron, steel and other metals is less than US$ 20 million (kernel/radius estimates) and US$ 80 million (stratification estimate) for the EU. Such decreases compared to the larger decline in the other product groups could still provide the positive effects reported in table (11) for the shares.

Now turning to the textiles, apparel, leather and footwear product group, the results support that presented in table (25) in the appendix. This sector experiences a decline to all three destinations and the estimates are significant at the 5% level. The decline in mirror exports varies from US$ 422–736 million for ROW, US$ 558–797 million for the USA and US$ 722–1,118 million for the EU. In all cases the decline is larger for the EU compared to the USA and ROW which might explain why regression estimates in the *agoa* empirical literature supports a positive impact for apparel and textile exports to the USA. However, comparing *agoa* beneficiaries to the counter-factual set of countries presents a different story. Some of this might be explained by the similarity of preferences in apparel and textile products offered to the Caribbean Basin countries (the Caribbean Basin Trade Protection Act (CBTPA)) and the free trade areas concluded with the Central American countries and Dominican Republic. This provides the Caribbean Basin countries a competitive edge over their SSA counterparts given that they are much closer to the USA market and therefore are more likely to have lower transport costs. Nonetheless, only a few of the *agoa* countries export significant volumes of apparel and textile products.

In concluding, this section draws attention to the products for which *agoa* beneficiaries have higher exports to the USA relative to the counter-factual countries. Of these products, the extractive industries seem to be more dominant within the group of products exported to the USA. The extractive industry's dominance might be explained by the presence of petroleum and petroleum products (HS 27). Within this category, exports are driven by Angola and Nigeria who are major oil exporters. In addition, gold, silver and precious metals (HS 71) form a significant component of exports from the following *agoa* beneficiaries—South Africa, Ghana, Mali, Tanzania, Guinea, Congo DR and Ethiopia. This is one result that finds support in the empirical literature Frazer and Van Biesebroeck (2010), Tadesse and Fayissa (2008, for example,). On the contrary, the same support was not found for apparel and textile exports. Much of the positive estimates provided by the empirical literature is probably due to the much larger decline in apparel and textile exports to the EU compared to the competitive decline in apparel and textile exports to the USA. This explains Collier and Venables (2007) results which compares apparel and textile product exports to the USA relative to the EU. The reported impact of 638.9%–1315% in their study is relative to the EU and it is for total exports. The results presented here is consistent with Collier and Venables (2007) given that the magnitude of the decline for exports to the EU is much larger than that of the EU in this section. Therefore, a regression of the ratio of the two outcomes would show that *agoa* countries exported more relative to the EU.

A second reason why apparel and textiles is not significant compared to the empirical literature is due to the construction of the counter-factual. Here, countries are matched and are thus comparable in terms of the competitiveness and comparative advantages. This, then reduces the differences between the countries and provides one with the results obtained here. Nonetheless, the existing empirical literature rarely constructs

the counter-factual in this way—the regressions in these studies include all developing, middle and some high income countries. Meanwhile, not all middle and high income countries produce the apparel and textiles products produced by the *agoa* countries. One way to establish whether the passage of time has led to the decline observed in the results would be to perform an annual analysis for apparel and textile exports. This is however, not carried out in the present analysis. The removal of the multi-fibre arrangement might have dampened the impact of the flexible preference arrangements provided for apparel and textiles.

Table 11: Cross-section Estimates for Disaggregated Mirror Export—shares (Model 1)

Outcome[a]	Kernel (bw=0.06)			Kernel (bw=0.01)			Kernel (bw=0.001)	Radius ($\delta = 0.05$)	Radius ($\delta = 0.01$)	Stratification
	ATT	ATE	All	ATT	ATE	All	ATT	ATT	ATT	ATT
Agriculture, meat and dairy, seafood										
EU [35 (40)]	.0305 (.041) [.743]	.0342	.0498	.0416 (.043) [.968]	.0298	.0498	.1261 (.0727) [1.734]	.0419 (.0428) [.977]	.0346 (.0401) [.864]	.0351 (.0356) [.987]
USA [35 (40)]	-.003 (.0057) [-.52]	-.0047	-.0036	-.002 (.0079) [-.246]	-.0046	-.0036	.0068 (.0221) [.308]	-.0019 (.0079) [-.238]	-.0024 (.0058) [-.422]	-.00306 (.0053) [-.573]
ROW [35 (40)]	-.0217 (.0452) [-.481]	-.0237	-.015	-.0656 (.0543) [-1.208]	-.0798	-.015	-.0719 (.1542) [-.467]	-.0637 (.0537) [-1.185]	-.0203 (.0459) [-.443]	-.01432 (.0482) [-.297]
Food, beverages, tobacco, wood, paper										
EU [35 (40)]	.0223 (.0322) [.692]	.0346	.0362	.0622 (.0329) [1.889]	.0727	.0362	-.0064 (.0574) [-.111]	.0623 (.033) [1.887]	.02 (.0331) [.605]	.0155 (.0379) [.409]
USA [35 (40)]	.0048 (.0035) [1.374]	.003	.0028	.008 (.006) [1.33]	.0084	.0028	.0004 (.002) [.209]	.0079 (.0061) [1.306]	.0047 (.0035) [1.352]	.00447 (.0038) [1.183]
ROW [35 (40)]	-.0446 (.0381) [-1.172]	-.0359	-.0298	-.0519 (.0557) [-.932]	-.0392	-.0298	-.0273 (.0461) [-.593]	-.0489 (.053) [-.923]	-.0508 (.0416) [-1.221]	-.04286 (.0329) [-1.303]
Extractive industries										
EU [35 (40)]	.0371 (.042) [.882]	.0342	.0337	.0553 (.0488) [1.133]	.0362	.0337	-.0617 (.0918) [-.672]	.0572 (.0488) [1.172]	.0378 (.0423) [.894]	.03895 (.0383) [1.018]
USA [35 (40)]	.067 (.029) [2.309]	.0634	.0588	.0866 (.0471) [1.838]	.0923	.0588	.052 (.0864) [.602]	.0869 (.0473) [1.838]	.0666 (.0296) [2.251]	.06428 (.0245) [2.622]
ROW [35 (40)]	-.0273 (.0635) [-.43]	-.0224	-.0187	-.0627 (.0897) [-.699]	-.0501	-.0187	-.0046 (.1278) [-.036]	-.0599 (.0889) [-.674]	-.0267 (.062) [-.431]	-.0313 (.0547) [-.572]
Chemicals, plastics, rubber										
EU [35 (40)]	.0119 (.0177) [.671]	.0058	.008	.0119 (.0299) [.396]	.0057	.008	-.0174 (.0191) [-.911]	.0117 (.03) [.392]	.012 (.0178) [.672]	.00993 (.0159) [.625]
USA [35 (40)]	-.0011 (.0009) [-1.171]	-.0027	-.0044	-.0019 (.0027) [-.719]	-.0035	-.0044	-.0049 (.0052) [-.929]	-.0022 (.003) [-.757]	-.001 (.0009) [-1.149]	-.00183 (.0013) [-1.380]
ROW [35 (40)]	-.0028 (.0124) [-.224]	-.0101	-.0153	-.0156 (.0192) [-.814]	-.0194	-.0153	-.0297 (.0326) [-.912]	-.0144 (.0182) [-.789]	-.0015 (.0121) [-.126]	-.003 (.0114) [-.263]
Textiles, apparel, leather, footwear										
EU [35 (40)]	-.0412 (.0292) [-1.412]	-.0112	-.0258	-.035 (.048) [-.728]	-.009	-.0258	-.0061 (.0917) [-.067]	-.0381 (.0487) [-.782]	-.0399 (.0291) [-1.373]	-.03824 (.0308) [-1.243]
USA [35 (40)]	-.0317 (.0362) [-.876]	-.026	-.0193	-.0605 (.0395) [-1.53]	-.0575	-.0193	-.0382 (.0632) [-.605]	-.0607 (.0393) [-1.543]	-.0309 (.0363) [-.853]	-.02275 (.0363) [-.626]
ROW [35 (40)]	-.0094 (.0277) [-.337]	-.0105	-.0034	-.0136 (.0592) [-.23]	.0032	-.0034	.0058 (.1127) [.052]	-.0152 (.0595) [-.256]	-.009 (.0283) [-.318]	-.00543 (.0233) [-.233]
Iron, steel, and other metals										
EU [35 (40)]	.0404 (.0197) [2.05]	.0389	.0353	.0594 (.0358) [1.659]	.0517	.0353	.0423 (.0523) [.809]	.0593 (.0358) [1.655]	.0399 (.0201) [1.988]	.04046 (.0197) [2.052]
USA [35 (40)]	.0044 (.0034) [1.298]	.0026	.002	.0068 (.0043) [1.582]	.0054	.002	.0042 (.0038) [1.115]	.0068 (.0043) [1.577]	.0043 (.0035) [1.233]	.00414 (.0031) [1.342]
ROW [35 (40)]	.0148 (.0304) [.487]	-.0065	-.005	.0203 (.0312) [.651]	.0172	-.005	.0393 (.0754) [.521]	.0201 (.0312) [.646]	.0127 (.0308) [.414]	.00878 (.0287) [.306]
Machinery, electronics, transportation equipment										
EU [35 (40)]	-.0065 (.0089) [-.727]	-.0133	-.0215	-.0046 (.0151) [-.306]	-.0087	-.0215	.0113 (.0214) [.527]	-.0073 (.0168) [-.432]	-.0065 (.0092) [-.713]	-.00953 (.0101) [-.940]
USA [35 (40)]	-.0044 (.003) [-1.449]	-.0069	-.0096	-.0019 (.0028) [-.672]	-.0029	-.0096	.0007 (.0019) [.365]	-.0021 (.0029) [-.726]	-.0046 (.0034) [-1.323]	-.00488 (.0032) [-1.533]
ROW [35 (40)]	-.0264 (.0152) [-1.732]	-.0331	-.0447	-.0233 (.0183) [-1.278]	-.0352	-.0447	-.0118 (.0225) [-.527]	-.0256 (.0191) [-1.344]	-.0261 (.0158) [-1.646]	-.03134 (.0184) [-1.703]
Other industries										
EU [35 (40)]	-.0043 (.0042) [-1.033]	-.0023	-.0024	-.0063 (.0062) [-1.027]	-.0048	-.0024	.0012 (.0044) [.281]	-.0065 (.0062) [-1.047]	-.0044 (.0044) [-1]	-.00373 (.0043) [-.876]
USA [35 (40)]	-.0023 (.0012) [-1.851]	-.0021	-.0023	-.0027 (.0016) [-1.762]	-.0025	-.0023	-.0013 (.0019) [-.702]	-.0029 (.0016) [-1.838]	-.0021 (.0011) [-1.851]	-.00225 (.0015) [-1.540]
ROW [35 (40)]	-.0066 (.0049) [-1.349]	-.0056	-.006	-.0045 (.0052) [-.867]	-.0054	-.006	-.0087 (.0174) [-.497]	-.0048 (.0052) [-.921]	-.0064 (.0047) [-1.375]	-.00708 (.0048) [-1.470]

Standard errors in brackets, Z values reported for the Kernel and Radius estimates and T-statistics reported for the Stratification estimates (these are reported in square brackets). All standard errors bootstrapped with 250 replications. Critical values $Z(\alpha = 0.05) = 1.96$; $Z(\alpha = 0.1) = 1.64$; $t_{60,0.1} = 1.296$; $t_{60,0.05} = 1.671$; $t_{75,0.1} = 1.293$; $t_{75,0.05} = 1.666$. Covariates used in matching include proxies for governance (corruption), economic structure, gravity type variables, endowments.

Table 12: Cross-section Estimates for Disaggregated Mirror Export—Levels (Model 1)

Variable	N [NT (NC)]	Kernel (bw=0.06)	Radius ($\delta = 0.05$)	stratification
Agriculture, meat and diary, seafood				
EU	75 [35 (40)]	-41388159.75 (117708007.92) [-.352]	-27757165.62 (114208838.72) [-.243]	-112059024 (147720179.77) [-.759]
USA	75 [35 (40)]	-117690500.21 (70838346.76) [-1.661]	-113284374.04 (71382478.88) [-1.587]	-139051056 (79692572.79) [-1.745]
ROW	75 [35 (40)]	-396403110.45 (228197877.27) [-1.737]	-359923746.78 (215588132.33) [-1.669]	-581408128 (329242178.55) [-1.766]
Food, beverages, tobacco, wood, paper				
EU	75 [35 (40)]	50627269.88 (113118548.07) [.448]	43558735.43 (118646511.83) [.367]	12439469 (122595129.55) [.101]
USA	72 [35 (40)]	-60944314.12 (47713091.7) [-1.277]	-58923940.7 (46887505.81) [-1.257]	-76676048 (56470067.42) [-1.358]
ROW	75 [35 (40)]	-322708301.78 (261778629.62) [-1.233]	-353994461.08 (297450419.92) [-1.19]	-356926336 (231511693.97) [-1.542]
Extractive industries				
EU	75 [35 (40)]	-151651122.74 (904656237.57) [-.168]	-114975134.89 (907714592.25) [-.127]	-159242032 (728994811.99) [-.218]
USA	74 [35 (40)]	771935364.4 (765661082.49) [1.008]	811356685.30 (768449780.53) [1.056]	663645696 (777822149.84) [.853]
ROW	75 [35 (40)]	-946054252.12 (1230067788.82) [-.769]	-796264670.46 (1182180821.01) [-.674]	-1577865984 (1469699279.51) [-1.074]
Chemical, plastics, rubber				
EU	75 [35 (40)]	-100705162.83 (73003678.21) [-1.379]	-91943822.83 (69228190.93) [-1.328]	-201513232 (178792617.88) [-1.127]
USA	74 [35 (40)]	-77694062.37 (56863680.03) [-1.366]	-69827366.12 (49771376.25) [-1.403]	-155705520 (144150778.24) [-1.08]
ROW	75 [35 (40)]	-409162604.9 (269319965.72) [-1.519]	-388416284.74 (278955890.07) [-1.392]	-689322112 (510929315.05) [-1.349]
Textiles, apparel, leather, footwear				
EU	75 [35 (40)]	-810311954.19 (395499979.21) [-2.049]	-722292979.47 (361197729.45) [-2]	-1118693504 (672446000.37) [-1.664]
USA	75 [35 (40)]	-618421519.26 (285669554.06) [-2.165]	-558591137.79 (265594981.34) [-2.103]	-797860992 (394626860.65) [-2.022]
ROW	75 [35 (40)]	-480588064.26 (232718426.27) [-2.065]	-422250927.36 (206341418.09) [-2.046]	-704548352 (425312608.78) [-1.657]
Iron, steel, and other metals				
EU	75 [35 (40)]	-13643429.11 (161449852.52) [-.085]	-18994650.39 (173726387.18) [-.109]	-72874736 (185720163.59) [-.392]
USA	72 [35 (40)]	-74608516.55 (71242809.58) [-1.047]	-69970369.06 (69957874.33) [-1]	-103207192 (102854002.66) [-1.003]
ROW	75 [35 (40)]	-362434423.77 (442171448.64) [-.820]	-361864083.8 (466482324.19) [-.776]	-736286720 (717946149.96) [-1.026]
Machinery, electronics, transportation equipment				
EU	75 [35 (40)]	-331521321.12 (293441238.26) [-1.13]	-347378556.34 (341907443.47) [-1.016]	-429447328 (303179381.43) [-1.416]
USA	75 [35 (40)]	-465266593.93 (406990392.05) [-1.143]	-513247444.44 (488194536.18) [-1.051]	-428258272 (272708595.34) [-1.57]
ROW	75 [35 (40)]	-1576718636.97 (1158022637.02) [-1.362]	-1657458605.5 (1351773923.32) [-1.226]	-1684602240 (1030113364.37) [-1.635]
Other industries				
EU	75 [35 (40)]	-82675669.53 (56483999.09) [-1.464]	-75761034.03 (54049464.52) [-1.402]	-107830712 (71430763.23) [-1.51]
USA	75 [35 (40)]	-106502251.59 (63595575.79) [-1.675]	-100836493.92 (61402777.84) [-1.642]	-120939120 (73246231.26) [-1.651]
ROW	75 [35 (40)]	-128951486.01 (82235856.62) [-1.568]	-127055045.87 (89505628.11) [-1.42]	-148475984 (87606561.89) [-1.695]

Bootstrapped Standard errors with 250 replications reported in parenthesis. Z-statistics reported for Kernel and Radius matching and T-statistics reported for Stratification matching are reported in square brackets. Critical values are $Z(\alpha = 0.1) = 1.64$; $Z(\alpha = 0.05) = 1.96$; $t_{75,0.1} = 1.293$; and $t_{75,0.05} = 1.666$. Outcome variables are based on mirror exports to the EU, USA and ROW for each country i. Results are based on the propensity score calculated in Model 1

4.4 Differences in Outcomes

Turning to the matched difference-in-difference, the results are not observed to be much different from the earlier results in terms of the impact on the outcomes. The results are shown for both the ratios and the levels of the outcomes. Tables (13 & 16) report the results for the ratios while tables (14-15) report the levels of the outcome. The base year outcomes are 1997 and 1999 respectively. The *post-agoa* time period (2002–2010/11) is compared to the base years and used in the difference-in-difference matching.

Table (13) reports results for the shares of the various components of imports by the USA from developing countries. The results for the *gsp* shares are again mostly insignificant. The results for *non–gsp* shares are significant for all differences except for some estimates in the kernel (bandwidth=0.001) column. The kernel (bandwidth=0.001) does poorly in all the other outcomes in this section. The results indicate that *no programme* shares declined significantly while *non–gsp* shares increased. Based on the table, *non–gsp* shares increased relative to the control countries by more than 10%, on average and *ceteris paribus*. The difference for 2004/1999 and 2004/1997 were the largest for the *non–gsp* shares—increasing by approximately 30%. The results are quite robust given that there are no sign reversals and significance is obtained in almost all columns—as well as for the estimator that on average has been returning insignificant estimates—Kernel (bandwidth=0.001).

The results for the levels are worse as shown in table (14). For *no programme* imports, the *ATT* estimates declined between US$ 300 and US$ 970 million relative to the control countries. The estimates are significant for the first four years of *agoa* compared to the base years chosen. *Non–gsp* outcomes are only significant under stratification matching. The kernel (bandwidth=0.06) for the 2002/1999 difference is the only other significant estimate reported. the increase in *non–gsp* imports relative to the control countries ranges between US$ 140 and US$ 720 million.

Table (15) reports the results for mirror exports to the three destinations. Results for the USA are reported based on two different data sources—the USITC and WITS data sources. The results for the levels report one significant estimate—mirror exports to the EU for the 2004/1997 difference. The difference is significant indicating that the difference in mirror exports to the EU between 2004 and 1997 was US$ 620 million less than the control countries, *ceteris paribus*. Mirror exports to the USA (for both data sources) show significant estimates for the 2002/1997 difference. This indicates that, mirror exports were US$ 399–430 million less than they were in 1997 relative to the control countries, *ceteris paribus*. On the other hand, mirror exports to ROW is significant in a few columns for the 2002/1997, 2002/1999, 2003/1997, 2003/1999, and 2005/1999 difference-in-difference estimates. The decline relative to the control countries ranges from US$ 600 million in 2002 to US$ 1,600 million in 2003.

The final table in this section, table (16) shows the results for the shares of mirror exports to the three destinations. The shares of mirror exports to the EU and ROW report insignificant estimates. Nevertheless, there are two significant estimates for the share of

mirror exports to the USA for the 2005/1999 difference. The difference implies that, *agoa* beneficiaries had their shares increase by 5.9% between 2005 and 1999 relative to the control countries, on average and *ceteris paribus*.

In concluding, the results for the levels are mostly insignificant. This might be due to the fact that the African beneficiaries export lower volumes than the control group of countries. On the contrary their exports to the rest of the world have in most cases significantly decreased compared to the control group of countries. The exports shares for the composition of imports by the USA reports more significant results. This points to the increasing importance of USA in the exports of the beneficiary countries compared to the control countries.

Table 13: Main Text: Matched Diff-in-Diff results for Import Shares (Model 1)

Outcome	K (bw=0.06)			K (bw=0.01)			K (bw=0.001)	R ($\delta = 0.05$)	R ($\delta = 0.01$)	Strat.
	ATT	ATE	All	ATT	ATE	All	ATT	ATT	ATT	ATT
No Program$_i$ / Total Imports$_i$										
$Ratio_{2002-1999}$	-.1294 (.065) [-1.993]	-.1678	-.1589	-.1157 (.0898) [-1.288]	-.1084	-.1589	-.1055 (.1968) [-.536]	-.1189 (.0898) [-1.324]	-.1359 (.0658) [-2.065]	-.1416 (.0644) [-2.1982]
$Ratio_{2003-1999}$	-.195 (.069) [-2.825]	-.2335	-.2292	-.208 (.0925) [-2.249]	-.1918	-.2292	-.1542 (.1551) [-.994]	-.2109 (.0924) [-2.282]	-.2016 (.0697) [-2.893]	-.2085 (.0703) [-2.964]
$Ratio_{2004-1999}$	-.3154 (.0587) [-5.377]	-.3437	-.3119	-.3213 (.08) [-4.016]	-.3148	-.3119	-.2665 (.1776) [-1.5]	-.3245 (.0798) [-4.068]	-.3192 (.0596) [-5.357]	-.3157 (.0635) [-4.9712]
$Ratio_{2005-1999}$	-.1845 (.0799) [-2.308]	-.249	-.2189	-.221 (.0997) [-2.216]	-.2351	-.2189	-.2987 (.1813) [-1.647]	-.2238 (.1002) [-2.233]	-.1889 (.0799) [-2.364]	-.2015 (.0817) [-2.4655]
$Ratio_{2006-1999}$	-.1575 (.0784) [-2.01]	-.2008	-.1851	-.1556 (.0981) [-1.587]	-.1385	-.1851	-.2219 (.2337) [-.949]	-.1583 (.0986) [-1.605]	-.1625 (.078) [-2.082]	-.176 (.0772) [-2.2782]
$Ratio_{2007-1999}$	-.104 (.0841) [-1.237]	-.1418	-.1468	-.1093 (.1016) [-1.076]	-.0947	-.1468	-.1739 (.232) [-.749]	-.1115 (.1025) [-1.088]	-.1083 (.0835) [-1.298]	-.1301 (.0787) [-1.6531]
$Ratio_{2008-1999}$	-.1144 (.0661) [-1.731]	-.1172	-.1241	-.1114 (.0924) [-1.205]	-.0636	-.1241	-.1868 (.3129) [-.597]	-.1149 (.0935) [-1.229]	-.1182 (.0675) [-1.749]	-.1286 (.0655) [-1.9622]
$Ratio_{2009-1999}$	-.1132 (.0594) [-1.905]	-.1236	-.1161	-.1096 (.0863) [-1.27]	-.0757	-.1161	-.2439 (.2712) [-.9]	-.1119 (.0879) [-1.274]	-.1157 (.0605) [-1.912]	-.129 (.0566) [-2.2791]
$Ratio_{2010-1999}$	-.0879 (.0527) [-1.668]	-.1214	-.0957	-.0736 (.0694) [-1.061]	-.0624	-.0957	-.0796 (.1901) [-.419]	-.0762 (.0709) [-1.075]	-.0908 (.0538) [-1.687]	-.1044 (.051) [-2.0463]
$Ratio_{2002-1997}$	-.1094 (.0694) [-1.575]	-.1378	-.1378	-.1037 (.1018) [-1.019]	-.0805	-.1378	-.0437 (.2179) [-.2]	-.1077 (.1005) [-1.071]	-.1138 (.0694) [-1.639]	-.1227 (.064) [-1.9155]
$Ratio_{2003-1997}$	-.1749 (.0723) [-2.419]	-.2035	-.2082	-.196 (.0996) [-1.967]	-.1638	-.2082	-.0923 (.1692) [-.546]	-.1997 (.0988) [-2.021]	-.1795 (.0721) [-2.489]	-.1896 (.0673) [-2.8173]
$Ratio_{2004-1997}$	-.2953 (.0599) [-4.926]	-.3137	-.2909	-.3093 (.0812) [-3.808]	-.2868	-.2909	-.2046 (.1908) [-1.072]	-.3133 (.0801) [-3.912]	-.2971 (.0603) [-4.924]	-.2968 (.0581) [-5.1108]
$Ratio_{2005-1997}$	-.1644 (.0795) [-2.069]	-.219	-.1978	-.209 (.0986) [-2.121]	-.2072	-.1978	-.2369 (.1923) [-1.232]	-.2126 (.0986) [-2.157]	-.1668 (.0791) [-2.108]	-.1826 (.0749) [-2.4384]
$Ratio_{2006-1997}$	-.1374 (.0775) [-1.774]	-.1709	-.164	-.1436 (.1039) [-1.381]	-.1106	-.164	-.16 (.2487) [-.644]	-.1471 (.1036) [-1.421]	-.1404 (.0772) [-1.819]	-.1571 (.0709) [-2.2164]
$Ratio_{2007-1997}$	-.0839 (.0881) [-.953]	-.1118	-.1257	-.0974 (.1159) [-.84]	-.0668	-.1257	-.112 (.2474) [-.453]	-.1003 (.1159) [-.865]	-.0862 (.0872) [-.989]	-.1112 (.0784) [-1.4186]
$Ratio_{2008-1997}$	-.0943 (.0678) [-1.391]	-.0872	-.1031	-.0994 (.1083) [-.918]	-.0357	-.1031	-.1249 (.336) [-.372]	-.1037 (.1082) [-.958]	-.096 (.0691) [-1.391]	-.1097 (.0648) [-1.6919]
$Ratio_{2009-1997}$	-.0931 (.062) [-1.502]	-.0936	-.095	-.0976 (.0978) [-.998]	-.0478	-.095	-.1821 (.2876) [-.633]	-.1008 (.0983) [-1.025]	-.0935 (.0632) [-1.479]	-.1101 (.0563) [-1.9571]
$Ratio_{2010-1997}$	-.0679 (.0555) [-1.222]	-.0914	-.0746	-.0616 (.0809) [-.761]	-.0345	-.0746	-.0178 (.2124) [-.084]	-.065 (.0814) [-.799]	-.0687 (.0561) [-1.224]	-.0854 (.0497) [-1.7208]
GSP$_i$ / Total Imports$_i$										
$Ratio_{2002-1999}$	-.0377 (.0587) [-.642]	-.0103	.0065	-.0308 (.0783) [-.393]	-.0252	.0065	-.1087 (.1299) [-.836]	-.0327 (.0789) [-.415]	-.0319 (.0594) [-.537]	-.0346 (.0523) [-.6622]
$Ratio_{2003-1999}$	-.035 (.0726) [-.482]	-.0089	.0123	-.0316 (.1009) [-.314]	-.0249	.0123	-.1037 (.1376) [-.754]	-.0335 (.1021) [-.328]	-.0287 (.0724) [-.396]	-.032 (.0651) [-.492]
$Ratio_{2004-1999}$	.0219 (.0398) [.549]	.0305	.0363	.0231 (.0648) [.357]	.012	.0363	-.1165 (.1334) [-.873]	.0217 (.0651) [.334]	.0256 (.0411) [.623]	.0134 (.0407) [.3295]
$Ratio_{2005-1999}$	-.0763 (.073) [-1.045]	-.0473	-.0138	-.095 (.0943) [-1.007]	-.0798	-.0138	-.0955 (.1365) [-.7]	-.0975 (.0953) [-1.023]	-.0714 (.0728) [-.98]	-.07 (.0625) [-1.1194]
$Ratio_{2006-1999}$	-.0479 (.0728) [-.659]	-.0229	.0012	-.0443 (.0911) [-.486]	-.0371	.0012	-.025 (.1884) [-.133]	-.0468 (.0915) [-.512]	-.0414 (.0731) [-.566]	-.0453 (.0651) [-.6961]
$Ratio_{2007-1999}$	-.086 (.0808) [-1.064]	-.0659	-.0242	-.0954 (.1031) [-.926]	-.0787	-.0242	-.0727 (.1601) [-.454]	-.0987 (.1043) [-.946]	-.0799 (.0807) [-.99]	-.0759 (.0722) [-1.0509]
$Ratio_{2008-1999}$	-.0496 (.0455) [-1.09]	-.0538	-.0242	-.0315 (.079) [-.398]	-.0524	-.0242	.0306 (.2409) [.127]	-.0334 (.0795) [-.42]	-.0472 (.0469) [-1.007]	-.0496 (.0413) [-1.2013]
$Ratio_{2009-1999}$	-.0361 (.0407) [-.887]	-.0407	-.018	-.0223 (.079) [-.282]	-.043	-.018	.023 (.2395) [.096]	-.0247 (.0796) [-.31]	-.0328 (.0421) [-.779]	-.0344 (.0387) [-.8889]
$Ratio_{2010-1999}$	-.0524 (.0361) [-1.452]	-.0396	-.0303	-.0612 (.0562) [-1.09]	-.0587	-.0303	-.12 (.13) [-.923]	-.0629 (.0562) [-1.118]	-.0493 (.038) [-1.298]	-.0505 (.0339) [-1.4923]
$Ratio_{2002-1997}$	-.0524 (.0552) [-.95]	-.0423	-.0149	-.0618 (.0898) [-.688]	-.0766	-.0149	-.1821 (.1633) [-1.115]	-.0631 (.0904) [-.698]	-.0488 (.0557) [-.876]	-.052 (.0548) [-.9498]
$Ratio_{2003-1997}$	-.0498 (.0699) [-.712]	-.0408	-.009	-.0626 (.1124) [-.557]	-.0762	-.009	-.1771 (.1712) [-1.035]	-.0639 (.1135) [-.563]	-.0456 (.0696) [-.655]	-.0495 (.0682) [-.7252]
$Ratio_{2004-1997}$	.0071 (.0415) [.171]	-.0015	.015	-.0079 (.0825) [-.095]	-.0393	.015	-.1899 (.1696) [-1.12]	-.0086 (.0825) [-.105]	.0087 (.043) [.203]	-.004 (.0481) [-.0832]
$Ratio_{2005-1997}$	-.0911 (.0699) [-1.304]	-.0793	-.0352	-.1259 (.0974) [-1.293]	-.1312	-.0352	-.1689 (.1731) [-.976]	-.1278 (.0986) [-1.297]	-.0882 (.0694) [-1.272]	-.0874 (.0646) [-1.352]
$Ratio_{2006-1997}$	-.0627 (.0701) [-.895]	-.0549	-.0202	-.0753 (.0937) [-.804]	-.0885	-.0202	-.0984 (.2217) [-.444]	-.0772 (.0941) [-.82]	-.0583 (.0703) [-.829]	-.0627 (.0656) [-.9567]
$Ratio_{2007-1997}$	-.1008 (.081) [-1.244]	-.0979	-.0456	-.1264 (.1118) [-1.131]	-.1301	-.0456	-.1461 (.1986) [-.736]	-.129 (.113) [-1.141]	-.0968 (.0808) [-1.199]	-.0933 (.0766) [-1.218]
$Ratio_{2008-1997}$	-.0644 (.0495) [-1.302]	-.0858	-.0455	-.0624 (.0931) [-.671]	-.1037	-.0455	-.0428 (.2732) [-.157]	-.0638 (.0932) [-.684]	-.0641 (.0509) [-1.259]	-.0671 (.0465) [-1.4414]
$Ratio_{2009-1997}$	-.0509 (.0436) [-1.167]	-.0727	-.0393	-.0533 (.0932) [-.571]	-.0944	-.0393	-.0504 (.2707) [-.186]	-.0551 (.0934) [-.589]	-.0496 (.0454) [-1.094]	-.0518 (.0425) [-1.2195]
$Ratio_{2010-1997}$	-.0672 (.0304) [-2.208]	-.0715	-.0517	-.0922 (.0608) [-1.517]	-.1101	-.0517	-.1934 (.1699) [-1.138]	-.0932 (.0605) [-1.541]	-.0662 (.032) [-2.068]	-.0679 (.0318) [-2.1343]
Non-GSP$_i$ / Total Imports$_i$										
$Ratio_{2002-1999}$	.1649 (.0528) [3.12]	.1763	.154	.1556 (.0668) [2.328]	.1491	.154	.1997 (.145) [1.378]	.1606 (.0652) [2.463]	.1671 (.0541) [3.087]	.1719 (.0472) [3.6405]
$Ratio_{2003-1999}$	.2264 (.0518) [4.367]	.2386	.2178	.2419 (.0658) [3.675]	.2276	.2178	.246 (.1491) [1.65]	.2467 (.0645) [3.825]	.2284 (.0529) [4.314]	.2338 (.0462) [5.0586]
$Ratio_{2004-1999}$	.2969 (.0602) [4.932]	.315	.2784	.3101 (.073) [4.249]	.3168	.2784	.3681 (.1924) [1.913]	.3147 (.0725) [4.34]	.2976 (.0611) [4.874]	.3027 (.0578) [5.2414]
$Ratio_{2005-1999}$	.2535 (.059) [4.297]	.2909	.2336	.3048 (.0769) [3.964]	.3115	.2336	.3833 (.2037) [1.882]	.3099 (.077) [4.022]	.2537 (.0601) [4.223]	.2622 (.0561) [4.6757]
$Ratio_{2006-1999}$	.2019 (.0515) [3.923]	.2212	.1847	.2021 (.0675) [2.993]	.1801	.1847	.2462 (.1796) [1.371]	.2071 (.0678) [3.055]	.2021 (.0525) [3.85]	.2138 (.0499) [4.2812]
$Ratio_{2007-1999}$	.1858 (.0523) [3.552]	.2027	.1718	.2019 (.0678) [2.979]	.1741	.1718	.2421 (.1877) [1.29]	.207 (.0677) [3.058]	.1854 (.0531) [3.49]	.1984 (.0477) [4.1611]
$Ratio_{2008-1999}$	.1603 (.0573) [2.799]	.1685	.1489	.155 (.0781) [1.985]	.117	.1489	.1646 (.2415) [.682]	.1604 (.078) [2.057]	.1618 (.0577) [2.802]	.1757 (.0548) [3.2081]
$Ratio_{2009-1999}$	.1525 (.0502) [3.04]	.1658	.1366	.157 (.067) [2.343]	.1291	.1366	.2279 (.1837) [1.241]	.1619 (.0671) [2.411]	.1527 (.0513) [2.975]	.1647 (.0455) [3.6169]
$Ratio_{2010-1999}$	.1409 (.0463) [3.044]	.1627	.1283	.15 (.0603) [2.485]	.1303	.1283	.1858 (.152) [1.222]	.1544 (.061) [2.533]	.1413 (.0475) [2.975]	.1556 (.041) [3.793]
$Ratio_{2002-1997}$	.1639 (.0516) [3.178]	.1757	.154	.1573 (.0655) [2.403]	.1529	.154	.2032 (.1382) [1.47]	.1623 (.0638) [2.545]	.1661 (.0529) [3.142]	.1711 (.0464) [3.691]
$Ratio_{2003-1997}$	.2254 (.0516) [4.372]	.238	.2178	.2437 (.0656) [3.718]	.2314	.2178	.2495 (.1474) [1.692]	.2484 (.0642) [3.869]	.2274 (.0526) [4.321]	.233 (.0459) [5.0785]
$Ratio_{2004-1997}$	.296 (.0599) [4.94]	.3144	.2784	.3118 (.0734) [4.246]	.3206	.2784	.3716 (.1938) [1.918]	.3165 (.073) [4.336]	.2966 (.0607) [4.884]	.3019 (.0576) [5.2373]
$Ratio_{2005-1997}$	.2525 (.0589) [4.289]	.2903	.2336	.3066 (.0774) [3.96]	.3154	.2336	.3868 (.2051) [1.886]	.3117 (.0776) [4.018]	.2527 (.06) [4.215]	.2613 (.056) [4.665]
$Ratio_{2006-1997}$	.201 (.0506) [3.971]	.2206	.1848	.2038 (.0661) [3.083]	.1839	.1848	.2497 (.1745) [1.431]	.2089 (.0664) [3.145]	.2011 (.0516) [3.896]	.2129 (.0493) [4.3175]
$Ratio_{2007-1997}$	.1849 (.0514) [3.599]	.2021	.1719	.2036 (.0661) [3.08]	.1779	.1719	.2456 (.1821) [1.348]	.2087 (.066) [3.162]	.1844 (.0522) [3.534]	.1976 (.0469) [4.2126]
$Ratio_{2008-1997}$	.1594 (.0562) [2.836]	.1679	.1489	.1567 (.0767) [2.042]	.1208	.1489	.1681 (.2371) [.709]	.1621 (.0767) [2.115]	.1608 (.0566) [2.84]	.1749 (.054) [3.2361]
$Ratio_{2009-1997}$	.1515 (.0492) [3.078]	.1652	.1366	.1587 (.0655) [2.423]	.1329	.1366	.2314 (.1779) [1.301]	.1636 (.0656) [2.493]	.1516 (.0504) [3.01]	.1638 (.0447) [3.6635]
$Ratio_{2010-1997}$	.14 (.0456) [3.069]	.1621	.1283	.1517 (.0593) [2.559]	.1341	.1283	.1893 (.1471) [1.287]	.1562 (.0599) [2.605]	.1402 (.0468) [2.997]	.1548 (.0405) [3.8221]

Standard errors in brackets. All standard errors bootstrapped with 250 replications. Z values reported for the Kernel and Radius estimates and T-statistics reported for the Stratification estimates (these are reported in square brackets). All standard errors bootstrapped with 250 replications. Critical values $Z(\alpha = 0.05) = 1.96$; $Z(\alpha = 0.1) = 1.64$; $t_{60,0.1} = 1.296$; $t_{60,0.05} = 1.671$; $t_{75,0.1} = 1.293$; $t_{75,0.05} = 1.666$. Number of treated=35; Control=40. Ratios are defined for each country *i*. Thus for example, GSP$_i$/Total Imports$_i$ can be the ratio of Country *i's* GSP imports out of total imports by the USA

Table 14: Matched Diff-in-Diff results for Levels and WITS data (Model 1)

Outcome	K (bw=0.06)			K (bw=0.01)			K (bw=0.001)	R ($\delta = 0.05$)	R ($\delta = 0.01$)	Strat.
	ATT	ATE	All	ATT	ATE	All	ATT	ATT	ATT	ATT
No Programme Imports										
$X_{2002-1997}$	-5.970e+08 (2.079e+08) [-2.871]	-7.606e+08	-8.753e+08	-6.341e+08 (2.482e+08) [-2.555]	-6.844e+08	-8.753e+08	-5.412e+08 (5.430e+08) [-.997]	-6.438e+08 (2.467e+08) [-2.609]	-5.856e+08 (2.180e+08) [-2.687]	-6.763e+08 (2.474e+08) [-2.7341]
$X_{2002-1999}$	-3.160e+08 (1.238e+08) [-2.553]	-3.850e+08	-4.152e+08	-3.377e+08 (1.393e+08) [-2.425]	-3.453e+08	-4.152e+08	-2.728e+08 (2.781e+08) [-.981]	-3.365e+08 (1.404e+08) [-2.397]	-3.069e+08 (1.237e+08) [-2.481]	-3.311e+08 (1.418e+08) [-2.3347]
$X_{2003-1997}$	-6.293e+08 (2.690e+08) [-2.339]	-8.068e+08	-9.422e+08	-6.111e+08 (2.497e+08) [-2.447]	-6.592e+08	-9.422e+08	-4.763e+08 (5.696e+08) [-.836]	-6.151e+08 (2.481e+08) [-2.479]	-6.071e+08 (2.699e+08) [-2.249]	-7.085e+08 (3.161e+08) [-2.2411]
$X_{2003-1999}$	-3.484e+08 (2.372e+08) [-1.469]	-4.312e+08	-4.821e+08	-3.146e+08 (2.293e+08) [-1.372]	-3.201e+08	-4.821e+08	-2.079e+08 (3.379e+08) [-.615]	-3.078e+08 (2.303e+08) [-1.337]	-3.284e+08 (2.249e+08) [-1.46]	-3.633e+08 (2.508e+08) [-1.4484]
$X_{2004-1997}$	-8.442e+08 (3.586e+08) [-2.354]	-1.114e+09	-1.327e+09	-8.322e+08 (3.447e+08) [-2.414]	-9.311e+08	-1.327e+09	-6.577e+08 (7.269e+08) [-.905]	-8.323e+08 (3.386e+08) [-2.458]	-8.120e+08 (3.618e+08) [-2.244]	-9.451e+08 (4.309e+08) [-2.1931]
$X_{2004-1999}$	-5.632e+08 (3.079e+08) [-1.829]	-7.387e+08	-8.666e+08	-5.358e+08 (2.931e+08) [-1.828]	-5.920e+08	-8.666e+08	-3.893e+08 (4.714e+08) [-.826]	-5.250e+08 (2.889e+08) [-1.817]	-5.333e+08 (2.974e+08) [-1.793]	-5.999e+08 (3.497e+08) [-1.7154]
$X_{2005-1997}$	-9.683e+08 (4.708e+08) [-2.057]	-1.389e+09	-1.684e+09	-8.532e+08 (4.462e+08) [-1.912]	-1.018e+09	-1.684e+09	-9.092e+08 (1.104e+09) [-.823]	-8.527e+08 (4.342e+08) [-1.964]	-9.370e+08 (4.807e+08) [-1.949]	-1.098e+09 (5.616e+08) [-1.9557]
$X_{2005-1999}$	-6.874e+08 (4.338e+08) [-1.584]	-1.013e+09	-1.224e+09	-5.567e+08 (4.339e+08) [-1.283]	-6.790e+08	-1.224e+09	-6.408e+08 (8.622e+08) [-.743]	-5.454e+08 (4.234e+08) [-1.288]	-6.583e+08 (4.296e+08) [-1.533]	-7.532e+08 (4.846e+08) [-1.5543]
$X_{2006-1997}$	-9.407e+08 (6.563e+08) [-1.433]	-1.512e+09	-1.830e+09	-7.563e+08 (7.308e+08) [-1.035]	-1.010e+09	-1.830e+09	-9.089e+08 (1.080e+09) [-.841]	-7.536e+08 (7.090e+08) [-1.063]	-9.052e+08 (6.584e+08) [-1.375]	-1.091e+09 (7.107e+08) [-1.5346]
$X_{2006-1999}$	-6.598e+08 (6.491e+08) [-1.016]	-1.136e+09	-1.369e+09	-4.598e+08 (7.756e+08) [-.593]	-6.705e+08	-1.369e+09	-6.405e+08 (8.321e+08) [-.77]	-4.464e+08 (7.553e+08) [-.591]	-6.265e+08 (6.393e+08) [-.98]	-7.455e+08 (6.518e+08) [-1.1438]
$X_{2007-1997}$	-9.072e+08 (7.821e+08) [-1.16]	-1.469e+09	-1.794e+09	-7.230e+08 (9.180e+08) [-.788]	-1.036e+09	-1.794e+09	-1.026e+09 (1.408e+09) [-.729]	-7.161e+08 (8.954e+08) [-.8]	-8.358e+08 (7.519e+08) [-1.112]	-1.193e+09 (8.832e+08) [-1.3506]
$X_{2007-1999}$	-6.262e+08 (7.921e+08) [-.791]	-1.093e+09	-1.334e+09	-4.265e+08 (9.719e+08) [-.439]	-6.971e+08	-1.334e+09	-7.578e+08 (1.182e+09) [-.641]	-4.089e+08 (9.507e+08) [-.43]	-5.571e+08 (7.545e+08) [-.738]	-8.477e+08 (8.266e+08) [-1.0255]
$X_{2008-1997}$	-5.878e+08 (1.022e+09) [-.575]	-1.264e+09	-1.625e+09	-2.704e+08 (1.292e+09) [-.209]	-7.644e+08	-1.625e+09	-1.294e+09 (1.968e+09) [-.657]	-2.621e+08 (1.272e+09) [-.206]	-4.931e+08 (9.696e+08) [-.509]	-1.003e+09 (1.103e+09) [-.9096]
$X_{2008-1999}$	-3.068e+08 (1.049e+09) [-.292]	-8.882e+08	-1.165e+09	26052853 (1.357e+09) [.019]	-4.253e+08	-1.165e+09	-1.026e+09 (1.752e+09) [-.585]	45173263 (1.338e+09) [.034]	-2.144e+08 (9.949e+08) [-.216]	-6.580e+08 (1.060e+09) [-.6211]
$X_{2009-1997}$	-7.561e+08 (7.519e+08) [-1.006]	-1.054e+09	-1.147e+09	-6.377e+08 (7.945e+08) [-.803]	-9.917e+08	-1.147e+09	-1.277e+09 (1.813e+09) [-.704]	-6.359e+08 (7.878e+08) [-.807]	-6.519e+08 (6.841e+08) [-.953]	-1.087e+09 (8.832e+08) [-1.2312]
$X_{2009-1999}$	-4.751e+08 (7.716e+08) [-.616]	-6.785e+08	-6.874e+08	-3.413e+08 (8.320e+08) [-.41]	-6.526e+08	-6.874e+08	-1.009e+09 (1.586e+09) [-.636]	-3.286e+08 (8.272e+08) [-.397]	-3.731e+08 (7.042e+08) [-.53]	-7.422e+08 (8.363e+08) [-.8874]
$X_{2010-1997}$	-6.897e+08 (1.070e+09) [-.645]	-1.186e+09	-1.370e+09	-5.160e+08 (1.363e+09) [-.379]	-9.741e+08	-1.370e+09	-1.868e+09 (2.959e+09) [-.631]	-5.155e+08 (1.354e+09) [-.381]	-5.514e+08 (9.947e+08) [-.554]	-1.288e+09 (1.286e+09) [-1.0022]
$X_{2010-1999}$	-4.088e+08 (1.101e+09) [-.371]	-8.105e+08	-9.102e+08	-2.196e+08 (1.418e+09) [-.155]	-6.350e+08	-9.102e+08	-1.600e+09 (2.744e+09) [-.583]	-2.082e+08 (1.409e+09) [-.148]	-2.727e+08 (1.027e+09) [-.265]	-9.432e+08 (1.235e+09) [-.7634]
$X_{2011-1997}$	-7.520e+08 (1.258e+09) [-.598]	-1.326e+09	-1.682e+09	-4.825e+08 (1.647e+09) [-.293]	-9.709e+08	-1.682e+09	-2.281e+09 (4.086e+09) [-.558]	-4.891e+08 (1.642e+09) [-.298]	-5.682e+08 (1.161e+09) [-.489]	-1.611e+09 (1.627e+09) [-.99]
$X_{2011-1999}$	-4.710e+08 (1.288e+09) [-.366]	-9.504e+08	-1.222e+09	-1.861e+08 (1.695e+09) [-.11]	-6.319e+08	-1.222e+09	-2.013e+09 (3.886e+09) [-.518]	-1.818e+08 (1.691e+09) [-.108]	-2.895e+08 (1.194e+09) [-.242]	-1.266e+09 (1.570e+09) [-.8062]
Non–GSP Imports										
$X_{2002-1997}$	1.437e+08 (88965207) [1.615]	1.469e+08	1.398e+08	1.644e+08 (1.495e+08) [1.1]	1.927e+08	1.398e+08	1.662e+08 (1.459e+08) [1.139]	1.663e+08 (1.497e+08) [1.111]	1.417e+08 (90312472) [1.568]	1.359e+08 (76289219) [1.7816]
$X_{2002-1999}$	1.463e+08 (89097171) [1.642]	1.471e+08	1.375e+08	1.642e+08 (1.495e+08) [1.099]	1.920e+08	1.375e+08	1.682e+08 (1.467e+08) [1.146]	1.660e+08 (1.497e+08) [1.109]	1.448e+08 (90331851) [1.603]	1.367e+08 (76278467) [1.7922]
$X_{2003-1997}$	1.959e+08 (1.476e+08) [1.327]	1.652e+08	1.788e+08	2.228e+08 (2.460e+08) [.906]	2.282e+08	1.788e+08	1.574e+08 (1.183e+08) [1.33]	2.257e+08 (2.462e+08) [.916]	1.909e+08 (1.509e+08) [1.265]	1.856e+08 (1.287e+08) [1.4417]
$X_{2003-1999}$	1.985e+08 (1.470e+08) [1.351]	1.654e+08	1.764e+08	2.226e+08 (2.461e+08) [.905]	2.275e+08	1.764e+08	1.594e+08 (1.205e+08) [1.322]	2.254e+08 (2.463e+08) [.915]	1.940e+08 (1.502e+08) [1.292]	1.864e+08 (1.281e+08) [1.4547]
$X_{2004-1997}$	5.173e+08 (3.943e+08) [1.312]	4.321e+08	4.391e+08	6.574e+08 (6.593e+08) [.997]	6.711e+08	4.391e+08	3.136e+08 (2.615e+08) [1.199]	6.619e+08 (6.598e+08) [1.003]	4.973e+08 (4.029e+08) [1.235]	4.944e+08 (3.392e+08) [1.4575]
$X_{2004-1999}$	5.200e+08 (3.939e+08) [1.32]	4.322e+08	4.368e+08	6.572e+08 (6.593e+08) [.997]	6.704e+08	4.368e+08	3.156e+08 (2.619e+08) [1.205]	6.616e+08 (6.597e+08) [1.003]	5.005e+08 (4.024e+08) [1.244]	4.952e+08 (3.387e+08) [1.4619]
$X_{2005-1997}$	7.040e+08 (5.576e+08) [1.263]	5.746e+08	5.764e+08	9.411e+08 (9.230e+08) [1.02]	9.076e+08	5.764e+08	2.870e+08 (2.941e+08) [.976]	9.467e+08 (9.236e+08) [1.025]	6.732e+08 (5.695e+08) [1.182]	6.761e+08 (4.742e+08) [1.4257]
$X_{2005-1999}$	7.066e+08 (5.572e+08) [1.268]	5.747e+08	5.740e+08	9.409e+08 (9.229e+08) [1.019]	9.070e+08	5.740e+08	2.890e+08 (2.938e+08) [.984]	9.464e+08 (9.236e+08) [1.025]	6.763e+08 (5.690e+08) [1.189]	6.769e+08 (4.737e+08) [1.4291]
$X_{2006-1997}$	5.263e+08 (4.595e+08) [1.146]	3.814e+08	3.757e+08	7.443e+08 (7.534e+08) [.988]	6.470e+08	3.757e+08	1.069e+08 (72067875) [1.484]	7.506e+08 (7.540e+08) [.995]	4.942e+08 (4.709e+08) [1.049]	5.197e+08 (3.915e+08) [1.3274]
$X_{2006-1999}$	5.290e+08 (4.588e+08) [1.153]	3.815e+08	3.734e+08	7.441e+08 (7.534e+08) [.988]	6.464e+08	3.734e+08	1.089e+08 (72112015) [1.51]	7.503e+08 (7.539e+08) [.995]	4.973e+08 (4.702e+08) [1.058]	5.204e+08 (3.907e+08) [1.332]
$X_{2007-1997}$	6.066e+08 (5.020e+08) [1.208]	4.446e+08	4.587e+08	8.015e+08 (8.286e+08) [.967]	7.134e+08	4.587e+08	1.375e+08 (90507914) [1.519]	8.073e+08 (8.292e+08) [.974]	5.728e+08 (5.145e+08) [1.113]	5.873e+08 (4.321e+08) [1.3593]
$X_{2007-1999}$	6.093e+08 (5.015e+08) [1.215]	4.447e+08	4.564e+08	8.013e+08 (8.285e+08) [.967]	7.127e+08	4.564e+08	1.395e+08 (90761683) [1.537]	8.070e+08 (8.291e+08) [.973]	5.759e+08 (5.138e+08) [1.121]	5.881e+08 (4.314e+08) [1.3634]
$X_{2008-1997}$	7.507e+08 (5.416e+08) [1.386]	6.201e+08	5.964e+08	1.025e+09 (8.839e+08) [1.16]	8.418e+08	5.964e+08	2.210e+08 (2.180e+08) [1.014]	1.030e+09 (8.843e+08) [1.165]	7.198e+08 (5.510e+08) [1.306]	7.111e+08 (4.591e+08) [1.5488]
$X_{2008-1999}$	7.533e+08 (5.410e+08) [1.392]	6.202e+08	5.940e+08	1.025e+09 (8.838e+08) [1.16]	8.411e+08	5.940e+08	2.230e+08 (2.205e+08) [1.011]	1.030e+09 (8.843e+08) [1.165]	7.229e+08 (5.503e+08) [1.314]	7.119e+08 (4.584e+08) [1.553]
$X_{2009-1997}$	3.059e+08 (2.469e+08) [1.239]	2.319e+08	2.107e+08	4.412e+08 (3.980e+08) [1.108]	3.687e+08	2.107e+08	1.174e+08 (95877132) [1.224]	4.452e+08 (3.983e+08) [1.118]	2.891e+08 (2.527e+08) [1.144]	2.926e+08 (2.107e+08) [1.3887]
$X_{2009-1999}$	3.085e+08 (2.461e+08) [1.254]	2.320e+08	2.083e+08	4.410e+08 (3.980e+08) [1.108]	3.681e+08	2.083e+08	1.194e+08 (98203823) [1.216]	4.449e+08 (3.983e+08) [1.117]	2.922e+08 (2.518e+08) [1.161]	2.934e+08 (2.097e+08) [1.3987]
$X_{2010-1997}$	3.648e+08 (2.893e+08) [1.261]	2.906e+08	2.446e+08	5.461e+08 (4.639e+08) [1.177]	4.392e+08	2.446e+08	1.094e+08 (1.124e+08) [.973]	5.500e+08 (4.642e+08) [1.185]	3.452e+08 (2.951e+08) [1.17]	3.446e+08 (2.475e+08) [1.3926]
$X_{2010-1999}$	3.674e+08 (2.884e+08) [1.274]	2.907e+08	2.422e+08	5.460e+08 (4.639e+08) [1.177]	4.385e+08	2.422e+08	1.114e+08 (1.149e+08) [.97]	5.497e+08 (4.642e+08) [1.184]	3.483e+08 (2.941e+08) [1.184]	3.454e+08 (2.465e+08) [1.4016]
$X_{2011-1997}$	4.076e+08 (3.265e+08) [1.248]	3.244e+08	2.629e+08	6.285e+08 (5.206e+08) [1.207]	5.190e+08	2.629e+08	1.699e+08 (1.763e+08) [.963]	6.331e+08 (5.210e+08) [1.215]	3.837e+08 (3.336e+08) [1.15]	3.936e+08 (2.775e+08) [1.4181]
$X_{2011-1999}$	4.102e+08 (3.257e+08) [1.26]	3.245e+08	2.606e+08	6.283e+08 (5.206e+08) [1.207]	5.183e+08	2.606e+08	1.719e+08 (1.788e+08) [.961]	6.328e+08 (5.209e+08) [1.215]	3.868e+08 (3.327e+08) [1.163]	3.944e+08 (2.766e+08) [1.4259]
GSP Imports										
$X_{2002-1997}$	58201010 (69242929) [.841]	88428495	78322590	53762113 (1.314e+08) [.409]	57660375	78322590	-93294244 (1.421e+08) [-.656]	56504787 (1.316e+08) [.429]	62142456 (69540150) [.894]	41110496 (81448026) [.5047]
$X_{2002-1999}$	21608795 (56122705) [.385]	28327703	-1316676.3	11123705 (1.146e+08) [.097]	6189294.6	-1316676.3	-1.248e+08 (1.913e+08) [-.652]	11212559 (1.146e+08) [.098]	27334966 (55071378) [.496]	-15398342 (80724939) [-.1908]
$X_{2003-1997}$	84239473 (97978444) [.86]	1.088e+08	68820788	68018117 (1.921e+08) [.354]	62484483	68820788	-1.596e+08 (2.440e+08) [-.654]	70315420 (1.919e+08) [.366]	91753883 (97889878) [.937]	38443024 (1.268e+08) [.3032]
$X_{2003-1999}$	47647260 (86559205) [.55]	48724115	-10818476	25379711 (1.788e+08) [.142]	11013405	-10818476	-1.911e+08 (2.933e+08) [-.652]	25023194 (1.788e+08) [.14]	56946394 (84935501) [.67]	-18065812 (1.303e+08) [-.1386]
$X_{2004-1997}$	66505447 (76978060) [.864]	62341833	10248893	28609517 (1.585e+08) [.18]	20607563	10248893	-2.085e+08 (3.159e+08) [-.66]	31170808 (1.582e+08) [.197]	78522933 (73649620) [1.066]	-16981054 (1.367e+08) [-.1242]
$X_{2004-1999}$	29913227 (70094758) [.427]	2241034.1	-69390378	-14028894 (1.530e+08) [-.092]	-30863519	-69390378	-2.399e+08 (3.652e+08) [-.657]	-14121423 (1.530e+08) [-.092]	43715436 (63719565) [.686]	-73489888 (1.481e+08) [-.4964]
$X_{2005-1997}$	56768776 (1.119e+08) [.507]	50131383	-21833097	3009834.8 (2.352e+08) [.013]	-6414139.8	-21833097	-3.252e+08 (4.909e+08) [-.662]	4696553.4 (2.350e+08) [.02]	74371371 (1.065e+08) [.699]	-61857152 (1.967e+08) [-.3145]
$X_{2005-1999}$	20176556 (1.048e+08) [.192]	-9969416	-1.015e+08	-39628579 (2.298e+08) [-.172]	-57885225	-1.015e+08	-3.567e+08 (5.402e+08) [-.66]	-40595680 (2.300e+08) [-.177]	39563875 (96502126) [.41]	-1.184e+08 (2.083e+08) [-.5681]
$X_{2006-1997}$	83047077 (1.794e+08) [.463]	78816777	-31687753	4792765.9 (3.816e+08) [.013]	-13221922	-31687753	-5.179e+08 (7.950e+08) [-.651]	5885157.4 (3.815e+08) [.015]	1.096e+08 (1.713e+08) [.64]	-96366632 (3.056e+08) [-.3154]
$X_{2006-1999}$	46454862 (1.719e+08) [.27]	18715982	-1.113e+08	-37845636 (3.762e+08) [-.101]	-64692996	-1.113e+08	-5.493e+08 (8.443e+08) [-.651]	-39407066 (3.765e+08) [-.105]	74777154 (1.613e+08) [.464]	-1.529e+08 (3.169e+08) [-.4824]
$X_{2007-1997}$	1.214e+08 (1.796e+08) [.676]	1.327e+08	34507379	69585321 (3.525e+08) [.197]	55974424	34507379	-3.773e+08 (5.681e+08) [-.664]	70617073 (3.524e+08) [.2]	1.430e+08 (1.766e+08) [.81]	-17060012 (2.654e+08) [-.0643]
$X_{2007-1999}$	84770898 (1.706e+08) [.497]	72560010	-45131891	26946906 (3.435e+08) [.078]	4503338.4	-45131891	-4.088e+08 (6.174e+08) [-.662]	25324839 (3.438e+08) [.074]	1.082e+08 (1.658e+08) [.653]	-73568856 (2.740e+08) [-.2685]
$X_{2008-1997}$	52047885 (86464704) [.602]	36597900	-31538137	-12802074 (1.644e+08) [-.078]	-25797302	-31538137	-2.344e+08 (3.570e+08) [-.657]	-10747179 (1.638e+08) [-.066]	66434237 (80334184) [.827]	-58560064 (1.740e+08) [-.3365]
$X_{2008-1999}$	15455666 (81964922) [.189]	-23502898	-1.112e+08	-55440488 (1.626e+08) [-.341]	-77268389	-1.112e+08	-2.659e+08 (4.063e+08) [-.654]	-56039413 (1.622e+08) [-.345]	31626742 (72552601) [.436]	-1.151e+08 (1.877e+08) [-.6131]

$X_{2009-1997}$	19680950 (40246040) [.489]	22390905	9538910.4	-32735760 (92481112) [-.354]	-32089232	9538910.4	-1.742e+08 (2.711e+08) [-.643]	-29942523 (92555116) [-.324]	27861939 (34810456) [.8]	-39726076 (95009581) [-.4181]
$X_{2009-1999}$	-16911271 (38824806) [-.436]	-37709895	-70100363	-75374175 (96682304) [-.78]	-83560319	-70100363	-2.057e+08 (3.204e+08) [-.642]	-75234757 (96582901) [-.779]	-6945557.9 (28583185) [-.243]	-96234920 (1.098e+08) [-.8767]
$X_{2010-1997}$	9566820.2 (46943170) [.204]	-3468503.9	-35706108	-54071382 (95968601) [-.563]	-54867656	-35706108	-2.071e+08 (3.045e+08) [-.68]	-51778669 (95855681) [-.54]	21528238 (36511876) [.59]	-81859328 (1.319e+08) [-.6207]
$X_{2010-1999}$	-27025394 (52140866) [-.518]	-63569295	-1.153e+08	-96709785 (1.074e+08) [-.901]	-1.063e+08	-1.153e+08	-2.386e+08 (3.538e+08) [-.674]	-97070892 (1.074e+08) [-.904]	-13279254 (38512879) [-.345]	-1.384e+08 (1.499e+08) [-.9231]
$X_{2011-1997}$	-14203515 (52704070) [-.269]	-32841375	-62712900	-82005065 (1.005e+08) [-.816]	-84199308	-62712900	-2.209e+08 (3.292e+08) [-.671]	-80610808 (1.004e+08) [-.803]	-601874.1 (40704222) [-.015]	-1.196e+08 (1.472e+08) [-.8124]
$X_{2011-1999}$	-50795731 (63018876) [-.806]	-92942171	-1.424e+08	-1.246e+08 (1.187e+08) [-1.05]	-1.357e+08	-1.424e+08	-2.523e+08 (3.785e+08) [-.667]	-1.259e+08 (1.190e+08) [-1.058]	-35409368 (49607285) [-.714]	-1.761e+08 (1.675e+08) [-1.0516]

Standard errors in brackets. All standard errors bootstrapped with 250 replications. Z values reported for the Kernel and Radius estimates and T-statistics reported for the Stratification estimates (these are reported in square brackets). All standard errors bootstrapped with 250 replications. Critical values $Z(\alpha = 0.05) = 1.96$; $Z(\alpha = 0.1) = 1.64$; $t_{60,0.1} = 1.296$; $t_{60,0.05} = 1.671$; $t_{75,0.1} = 1.293$; $t_{75,0.05} = 1.666$. Number of Treated=35; Control=26. Ratios are defined for each country i. Thus for example, $GSP_i/Totalimports_i$ can be the ratio of Country i's GSP imports out of total imports by the USA

Table 15: Matched Diff-in-Diff results for Mirror Exports (levels) (Model 1)

Outcome	K (bw=0.06)			K (bw=0.01)			K (bw=0.001)	R ($\delta = 0.05$)	R ($\delta = 0.01$)
	ATT	ATE	All	ATT	ATE	All	ATT	ATT	ATT
Mirror Exports, EU									
$X_{2002-1997}$	-1.929e+08 (1.905e+08) [-1.013]	-1.859e+08	-3.129e+08	-68617483 (2.179e+08) [-.315]	-1.658e+08	-3.129e+08	2.343e+08 (2.234e+08) [1.049]	-79007687 (2.175e+08) [-.363]	-1.609e+08 (1.743e+08) [-.923]
$X_{2002-1999}$	-1.131e+08 (1.457e+08) [-.777]	-1.628e+08	-2.777e+08	-94645290 (2.073e+08) [-.456]	-1.685e+08	-2.777e+08	-1.316e+08 (1.942e+08) [-.678]	-99447247 (2.037e+08) [-.488]	-90757958 (1.309e+08) [-.693]
$X_{2003-1997}$	-4.129e+08 (3.119e+08) [-1.324]	-6.306e+08	-8.959e+08	-3.336e+08 (2.906e+08) [-1.148]	-4.360e+08	-8.959e+08	-2.364e+08 (2.563e+08) [-.922]	-3.467e+08 (2.852e+08) [-1.216]	-3.610e+08 (2.814e+08) [-1.283]
$X_{2003-1999}$	-3.331e+08 (2.974e+08) [-1.12]	-6.075e+08	-8.607e+08	-3.596e+08 (3.811e+08) [-.944]	-4.388e+08	-8.607e+08	-6.024e+08 (5.983e+08) [-1.007]	-3.672e+08 (3.734e+08) [-.983]	-2.909e+08 (2.694e+08) [-1.079]
$X_{2004-1997}$	-7.055e+08 (5.050e+08) [-1.397]	-1.124e+09	-1.629e+09	-6.504e+08 (4.278e+08) [-1.52]	-7.716e+08	-1.629e+09	-6.354e+08 (6.643e+08) [-.957]	-6.646e+08 (4.203e+08) [-1.581]	-6.211e+08 (4.619e+08) [-1.345]
$X_{2004-1999}$	-6.257e+08 (4.762e+08) [-1.314]	-1.101e+09	-1.593e+09	-6.764e+08 (5.108e+08) [-1.324]	-7.743e+08	-1.593e+09	-1.001e+09 (9.814e+08) [-1.02]	-6.851e+08 (5.007e+08) [-1.368]	-5.510e+08 (4.345e+08) [-1.268]
$X_{2005-1997}$	-6.847e+08 (6.774e+08) [-1.011]	-1.268e+09	-1.996e+09	-7.261e+08 (7.045e+08) [-1.031]	-9.136e+08	-1.996e+09	-1.300e+09 (1.412e+09) [-.92]	-7.231e+08 (6.849e+08) [-1.056]	-5.786e+08 (6.206e+08) [-.932]
$X_{2005-1999}$	-6.049e+08 (6.717e+08) [-.901]	-1.245e+09	-1.960e+09	-7.521e+08 (8.237e+08) [-.913]	-9.164e+08	-1.960e+09	-1.666e+09 (1.708e+09) [-.975]	-7.435e+08 (8.031e+08) [-.926]	-5.085e+08 (6.180e+08) [-.823]
$X_{2006-1997}$	-9.751e+08 (9.203e+08) [-1.06]	-1.859e+09	-2.779e+09	-1.031e+09 (1.019e+09) [-1.012]	-1.228e+09	-2.779e+09	-2.147e+09 (2.191e+09) [-.98]	-1.023e+09 (9.959e+08) [-1.027]	-8.440e+08 (8.427e+08) [-1.002]
$X_{2006-1999}$	-8.953e+08 (9.213e+08) [-.972]	-1.836e+09	-2.743e+09	-1.057e+09 (1.151e+09) [-.918]	-1.231e+09	-2.743e+09	-2.513e+09 (2.516e+09) [-.999]	-1.043e+09 (1.127e+09) [-.925]	-7.739e+08 (8.477e+08) [-.913]
$X_{2007-1997}$	-1.196e+09 (1.159e+09) [-1.032]	-2.280e+09	-3.556e+09	-1.179e+09 (1.081e+09) [-1.09]	-1.398e+09	-3.556e+09	-2.602e+09 (2.528e+09) [-1.029]	-1.167e+09 (1.060e+09) [-1.102]	-1.016e+09 (1.054e+09) [-.964]
$X_{2007-1999}$	-1.116e+09 (1.144e+09) [-.976]	-2.257e+09	-3.521e+09	-1.205e+09 (1.201e+09) [-1.003]	-1.401e+09	-3.521e+09	-2.968e+09 (2.871e+09) [-1.034]	-1.188e+09 (1.179e+09) [-1.008]	-9.460e+08 (1.042e+09) [-.908]
$X_{2008-1997}$	-1.131e+09 (1.623e+09) [-.696]	-2.468e+09	-4.209e+09	-1.079e+09 (1.684e+09) [-.64]	-1.465e+09	-4.209e+09	-3.387e+09 (3.368e+09) [-1.006]	-1.050e+09 (1.654e+09) [-.635]	-9.092e+08 (1.490e+09) [-.61]
$X_{2008-1999}$	-1.051e+09 (1.622e+09) [-.648]	-2.445e+09	-4.174e+09	-1.105e+09 (1.809e+09) [-.611]	-1.468e+09	-4.174e+09	-3.753e+09 (3.714e+09) [-1.01]	-1.071e+09 (1.778e+09) [-.602]	-8.390e+08 (1.494e+09) [-.562]
$X_{2009-1997}$	-1.262e+09 (1.130e+09) [-1.117]	-1.963e+09	-2.918e+09	-1.233e+09 (1.361e+09) [-.906]	-1.507e+09	-2.918e+09	-3.124e+09 (3.268e+09) [-.956]	-1.229e+09 (1.349e+09) [-.911]	-1.059e+09 (9.937e+08) [-1.066]
$X_{2009-1999}$	-1.182e+09 (1.124e+09) [-1.052]	-1.940e+09	-2.882e+09	-1.259e+09 (1.480e+09) [-.851]	-1.510e+09	-2.882e+09	-3.490e+09 (3.638e+09) [-.959]	-1.249e+09 (1.466e+09) [-.852]	-9.891e+08 (9.935e+08) [-.996]
$X_{2010-1997}$	-1.709e+09 (1.469e+09) [-1.163]	-2.861e+09	-4.047e+09	-1.915e+09 (1.862e+09) [-1.029]	-2.178e+09	-4.047e+09	-4.824e+09 (4.771e+09) [-1.011]	-1.901e+09 (1.844e+09) [-1.031]	-1.455e+09 (1.299e+09) [-1.121]
$X_{2010-1999}$	-1.629e+09 (1.472e+09) [-1.107]	-2.838e+09	-4.012e+09	-1.941e+09 (1.999e+09) [-.971]	-2.181e+09	-4.012e+09	-5.190e+09 (5.148e+09) [-1.008]	-1.922e+09 (1.981e+09) [-.97]	-1.385e+09 (1.307e+09) [-1.06]
Mirror Exports, USA									
$X_{2002-1997}$	-4.259e+08 (2.022e+08) [-2.107]	-5.860e+08	-7.172e+08	-4.115e+08 (2.328e+08) [-1.768]	-4.640e+08	-7.172e+08	-5.383e+08 (6.494e+08) [-.829]	-4.150e+08 (2.327e+08) [-1.784]	-3.929e+08 (1.784e+08) [-2.203]
$X_{2002-1999}$	-1.590e+08 (1.629e+08) [-.976]	-2.148e+08	-3.038e+08	-1.366e+08 (2.184e+08) [-.626]	-1.503e+08	-3.038e+08	-2.961e+08 (4.352e+08) [-.68]	-1.315e+08 (2.195e+08) [-.599]	-1.305e+08 (1.379e+08) [-.946]
$X_{2003-1997}$	-3.617e+08 (3.917e+08) [-.924]	-5.373e+08	-7.234e+08	-3.016e+08 (4.540e+08) [-.664]	-3.694e+08	-7.234e+08	-5.444e+08 (7.913e+08) [-.688]	-2.967e+08 (4.537e+08) [-.654]	-3.029e+08 (3.365e+08) [-.9]
$X_{2003-1999}$	-97094482 (3.929e+08) [-.247]	-1.865e+08	-3.182e+08	-1277313.6 (5.163e+08) [-.002]	-55662923	-3.182e+08	-3.196e+08 (5.889e+08) [-.543]	11184695 (5.174e+08) [.022]	-43035075 (3.491e+08) [-.123]
$X_{2004-1997}$	-2.100e+08 (5.889e+08) [-.357]	-5.938e+08	-8.894e+08	-1.444e+08 (7.830e+08) [-.184]	-2.228e+08	-8.894e+08	-6.259e+08 (1.075e+09) [-.582]	-1.307e+08 (7.808e+08) [-.167]	-1.400e+08 (5.328e+08) [-.263]
$X_{2004-1999}$	42229152 (6.217e+08) [.068]	-2.688e+08	-4.952e+08	1.883e+08 (8.880e+08) [.212]	90876009	-4.952e+08	-4.302e+08 (8.758e+08) [-.491]	2.078e+08 (8.890e+08) [.234]	1.099e+08 (5.746e+08) [.191]
$X_{2005-1997}$	-42170097 (8.831e+08) [-.048]	-5.710e+08	-1.064e+09	1.192e+08 (1.323e+09) [.09]	-43128590	-1.064e+09	-1.063e+09 (1.780e+09) [-.597]	1.354e+08 (1.320e+09) [.103]	41753649 (8.158e+08) [.051]
$X_{2005-1999}$	1.899e+08 (9.479e+08) [.2]	-2.674e+08	-6.851e+08	4.394e+08 (1.447e+09) [.304]	2.706e+08	-6.851e+08	-9.273e+08 (1.577e+09) [-.588]	4.591e+08 (1.447e+09) [.317]	2.749e+08 (8.884e+08) [.309]
$X_{2006-1997}$	-90026388 (1.116e+09) [-.081]	-7.713e+08	-1.349e+09	41845172 (1.688e+09) [.025]	-2.694e+08	-1.349e+09	-1.429e+09 (2.004e+09) [-.713]	61221890 (1.679e+09) [.036]	23901849 (1.024e+09) [.023]
$X_{2006-1999}$	1.046e+08 (1.178e+09) [.089]	-4.383e+08	-9.791e+08	3.646e+08 (1.791e+09) [.204]	44281395	-9.791e+08	-1.301e+09 (1.810e+09) [-.719]	3.853e+08 (1.791e+09) [.215]	2.204e+08 (1.094e+09) [.201]
$X_{2007-1997}$	32285992 (1.350e+09) [.024]	-5.538e+08	-1.111e+09	1.589e+08 (1.989e+09) [.08]	-1.547e+08	-1.111e+09	-1.382e+09 (2.133e+09) [-.648]	1.822e+08 (1.979e+09) [.092]	1.834e+08 (1.232e+09) [.149]
$X_{2007-1999}$	2.336e+08 (1.404e+09) [.166]	-2.511e+08	-7.505e+08	5.093e+08 (2.099e+09) [.243]	1.590e+08	-7.505e+08	-1.271e+09 (1.934e+09) [-.657]	5.322e+08 (2.097e+09) [.254]	3.857e+08 (1.300e+09) [.297]
$X_{2008-1997}$	4.498e+08 (1.656e+09) [.272]	-58853910	-7.721e+08	6.953e+08 (2.465e+09) [.282]	2.507e+08	-7.721e+08	-1.458e+09 (2.340e+09) [-.623]	7.213e+08 (2.454e+09) [.294]	6.345e+08 (1.506e+09) [.421]
$X_{2008-1999}$	6.093e+08 (1.700e+09) [.358]	2.272e+08	-4.299e+08	9.874e+08 (2.561e+09) [.386]	5.644e+08	-4.299e+08	-1.368e+09 (2.137e+09) [-.64]	1.010e+09 (2.559e+09) [.395]	7.936e+08 (1.576e+09) [.504]
$X_{2009-1997}$	-4.635e+08 (1.093e+09) [-.424]	-6.530e+08	-8.260e+08	-3.648e+08 (1.342e+09) [-.272]	-6.084e+08	-8.260e+08	-1.461e+09 (2.175e+09) [-.672]	-3.475e+08 (1.341e+09) [-.259]	-2.841e+08 (9.210e+08) [-.309]
$X_{2009-1999}$	-2.287e+08 (1.075e+09) [-.213]	-2.978e+08	-4.419e+08	-79603457 (1.434e+09) [-.055]	-2.947e+08	-4.419e+08	-1.351e+09 (1.978e+09) [-.683]	-60286811 (1.437e+09) [-.042]	-55312686 (9.313e+08) [-.059]
$X_{2010-1997}$	-3.402e+08 (1.532e+09) [-.222]	-6.473e+08	-9.909e+08	-2.256e+08 (2.068e+09) [-.109]	-5.176e+08	-9.909e+08	-2.174e+09 (3.449e+09) [-.63]	-2.105e+08 (2.067e+09) [-.102]	-98207044 (1.330e+09) [-.074]
$X_{2010-1999}$	-1.017e+08 (1.533e+09) [-.066]	-3.335e+08	-6.268e+08	82679221 (2.209e+09) [.037]	-2.039e+08	-6.268e+08	-2.176e+09 (3.245e+09) [-.671]	97992736 (2.211e+09) [.044]	1.386e+08 (1.354e+09) [.102]
Imports(USITC)									
$X_{2002-1997}$	-3.824e+08 (1.713e+08) [-2.232]	-5.224e+08	-6.580e+08	-3.670e+08 (1.703e+08) [-2.156]	-4.298e+08	-6.580e+08	-4.573e+08 (5.599e+08) [-.817]	-3.728e+08 (1.697e+08) [-2.197]	-3.709e+08 (1.757e+08) [-2.11]
$X_{2002-1999}$	-1.345e+08 (1.344e+08) [-1.001]	-2.034e+08	-2.718e+08	-1.165e+08 (1.608e+08) [-.724]	-1.403e+08	-2.718e+08	-2.145e+08 (3.628e+08) [-.591]	-1.136e+08 (1.625e+08) [-.699]	-1.230e+08 (1.280e+08) [-.961]
$X_{2003-1997}$	-3.308e+08 (3.169e+08) [-1.044]	-5.283e+08	-6.897e+08	-2.439e+08 (3.492e+08) [-.698]	-3.600e+08	-6.897e+08	-4.599e+08 (6.792e+08) [-.677]	-2.434e+08 (3.488e+08) [-.698]	-3.085e+08 (3.091e+08) [-.998]

$X_{2003-1999}$	-82999020 (3.261e+08) [-.255]	-2.094e+08	-3.036e+08	6681425.1 (4.096e+08) [.016]	-70517864	-3.036e+08	-2.170e+08 (5.027e+08) [-.432]	15832480 (4.099e+08) [.039]	-60544199 (3.119e+08) [-.194]
$X_{2004-1997}$	-2.475e+08 (4.869e+08) [-.508]	-6.167e+08	-8.671e+08	-88889321 (6.421e+08) [-.138]	-2.299e+08	-8.671e+08	-5.278e+08 (9.194e+08) [-.574]	-82631582 (6.405e+08) [-.129]	-2.261e+08 (4.839e+08) [-.467]
$X_{2004-1999}$	317097.78 (5.070e+08) [.001]	-2.977e+08	-4.810e+08	1.617e+08 (7.181e+08) [.225]	59574392	-4.810e+08	-2.849e+08 (7.542e+08) [-.378]	1.766e+08 (7.171e+08) [.246]	21782273 (4.988e+08) [.044]
$X_{2005-1997}$	-1.850e+08 (7.774e+08) [-.238]	-7.552e+08	-1.112e+09	1.801e+08 (1.124e+09) [.16]	-98638629	-1.112e+09	-9.086e+08 (1.551e+09) [-.586]	1.875e+08 (1.121e+09) [.167]	-1.711e+08 (7.786e+08) [-.22]
$X_{2005-1999}$	62891262 (8.040e+08) [.078]	-4.362e+08	-7.258e+08	4.307e+08 (1.200e+09) [.359]	1.909e+08	-7.258e+08	-6.657e+08 (1.385e+09) [-.481]	4.467e+08 (1.197e+09) [.373]	76839895 (8.002e+08) [.096]
$X_{2006-1997}$	-2.946e+08 (9.936e+08) [-.297]	-1.037e+09	-1.458e+09	1.389e+08 (1.441e+09) [.096]	-3.472e+08	-1.458e+09	-1.258e+09 (1.784e+09) [-.705]	1.484e+08 (1.429e+09) [.104]	-2.710e+08 (9.856e+08) [-.275]]
$X_{2006-1999}$	-46778686 (1.018e+09) [-.046]	-7.175e+08	-1.072e+09	3.895e+08 (1.513e+09) [.257]	-57717796	-1.072e+09	-1.016e+09 (1.592e+09) [-.638]	4.076e+08 (1.500e+09) [.272]	-23034321 (1.005e+09) [-.023]
$X_{2007-1997}$	-1.423e+08 (1.178e+09) [-.121]	-8.789e+08	-1.279e+09	2.921e+08 (1.705e+09) [.171]	-2.449e+08	-1.279e+09	-1.221e+09 (1.915e+09) [-.638]	3.052e+08 (1.692e+09) [.18]	-88466094 (1.152e+09) [-.077]
$X_{2007-1999}$	1.055e+08 (1.211e+09) [.087]	-5.599e+08	-8.928e+08	5.427e+08 (1.781e+09) [.305]	44605630	-8.928e+08	-9.782e+08 (1.737e+09) [-.563]	5.645e+08 (1.767e+09) [.319]	1.595e+08 (1.183e+09) [.135]
$X_{2008-1997}$	2.333e+08 (1.466e+09) [.159]	-6.005e+08	-1.044e+09	8.067e+08 (2.121e+09) [.38]	70575044	-1.044e+09	-1.281e+09 (2.081e+09) [-.615]	8.209e+08 (2.107e+09) [.39]	3.080e+08 (1.425e+09) [.216]
$X_{2008-1999}$	4.811e+08 (1.504e+09) [.32]	-2.815e+08	-6.578e+08	1.057e+09 (2.196e+09) [.482]	3.601e+08	-6.578e+08	-1.038e+09 (1.907e+09) [-.544]	1.080e+09 (2.182e+09) [.495]	5.560e+08 (1.463e+09) [.38]
$X_{2009-1997}$	-4.276e+08 (8.908e+08) [-.48]	-8.003e+08	-9.249e+08	-2.057e+08 (1.096e+09) [-.188]	-6.429e+08	-9.249e+08	-1.315e+09 (1.975e+09) [-.666]	-1.982e+08 (1.091e+09) [-.182]	-3.338e+08 (8.271e+08) [-.404]
$X_{2009-1999}$	-1.798e+08 (9.190e+08) [-.196]	-4.813e+08	-5.388e+08	44887986 (1.152e+09) [.039]	-3.533e+08	-5.388e+08	-1.072e+09 (1.790e+09) [-.599]	60958894 (1.148e+09) [.053]	-85831484 (8.581e+08) [-.1]
$X_{2010-1997}$	-3.127e+08 (1.270e+09) [-.246]	-8.990e+08	-1.153e+09	-5218974.3 (1.750e+09) [-.003]	-5.755e+08	-1.153e+09	-1.941e+09 (3.129e+09) [-.62]	358557.51 (1.742e+09) [0]	-1.844e+08 (1.200e+09) [-.154]
$X_{2010-1999}$	-64855409 (1.304e+09) [-.05]	-5.800e+08	-7.667e+08	2.454e+08 (1.813e+09) [.135]	-2.860e+08	-7.667e+08	-1.698e+09 (2.956e+09) [-.575]	2.596e+08 (1.806e+09) [.144]	63475807 (1.237e+09) [.051]
$X_{2011-1997}$	-3.582e+08 (1.471e+09) [-.243]	-1.034e+09	-1.471e+09	71995643 (2.056e+09) [.035]	-5.224e+08	-1.471e+09	-2.306e+09 (4.219e+09) [-.547]	70683859 (2.052e+09) [.034]	-1.875e+08 (1.383e+09) [-.136]
$X_{2011-1999}$	-1.104e+08 (1.504e+09) [-.073]	-7.149e+08	-1.085e+09	3.226e+08 (2.115e+09) [.152]	-2.329e+08	-1.085e+09	-2.063e+09 (4.059e+09) [-.508]	3.299e+08 (2.112e+09) [.156]	60455114 (1.420e+09) [.043]
Mirror Exports, ROW									
$X_{2002-1997}$	-6.417e+08 (5.336e+08) [-1.203]	-1.009e+09	-1.461e+09	-7.895e+08 (5.080e+08) [-1.554]	-8.433e+08	-1.461e+09	-1.235e+09 (1.124e+09) [-1.099]	-8.217e+08 (5.348e+08) [-1.536]	-5.517e+08 (5.239e+08) [-1.053]
$X_{2002-1999}$	-4.909e+08 (4.015e+08) [-1.223]	-9.147e+08	-1.422e+09	-5.829e+08 (3.332e+08) [-1.75]	-6.617e+08	-1.422e+09	-6.939e+08 (6.693e+08) [-1.037]	-6.009e+08 (3.352e+08) [-1.793]	-4.296e+08 (3.965e+08) [-1.084]
$X_{2003-1997}$	-1.228e+09 (8.716e+08) [-1.409]	-2.038e+09	-2.928e+09	-1.628e+09 (9.868e+08) [-1.65]	-1.669e+09	-2.928e+09	-2.815e+09 (2.636e+09) [-1.068]	-1.666e+09 (1.016e+09) [-1.639]	-1.089e+09 (8.530e+08) [-1.276]
$X_{2003-1999}$	-1.056e+09 (7.034e+08) [-1.501]	-1.938e+09	-2.897e+09	-1.380e+09 (8.048e+08) [-1.715]	-1.487e+09	-2.897e+09	-2.185e+09 (2.123e+09) [-1.029]	-1.404e+09 (8.015e+08) [-1.752]	-9.382e+08 (6.806e+08) [-1.379]
$X_{2004-1997}$	-1.725e+09 (1.414e+09) [-1.22]	-3.227e+09	-4.803e+09	-2.310e+09 (1.588e+09) [-1.455]	-2.443e+09	-4.803e+09	-4.642e+09 (4.368e+09) [-1.063]	-2.355e+09 (1.618e+09) [-1.456]	-1.504e+09 (1.360e+09) [-1.106]
$X_{2004-1999}$	-1.559e+09 (1.212e+09) [-1.286]	-3.123e+09	-4.793e+09	-2.043e+09 (1.440e+09) [-1.419]	-2.261e+09	-4.793e+09	-3.963e+09 (3.801e+09) [-1.043]	-2.076e+09 (1.430e+09) [-1.452]	-1.350e+09 (1.142e+09) [-1.182]
$X_{2005-1997}$	-2.453e+09 (1.841e+09) [-1.332]	-4.481e+09	-6.720e+09	-3.418e+09 (2.215e+09) [-1.543]	-3.583e+09	-6.720e+09	-6.844e+09 (6.389e+09) [-1.071]	-3.462e+09 (2.244e+09) [-1.543]	-2.143e+09 (1.731e+09) [-1.237]
$X_{2005-1999}$	-2.298e+09 (1.623e+09) [-1.416]	-4.382e+09	-6.719e+09	-3.139e+09 (2.097e+09) [-1.497]	-3.401e+09	-6.719e+09	-6.085e+09 (5.766e+09) [-1.055]	-3.171e+09 (2.074e+09) [-1.529]	-1.992e+09 (1.494e+09) [-1.333]
$X_{2006-1997}$	-2.994e+09 (2.379e+09) [-1.258]	-5.663e+09	-8.737e+09	-4.588e+09 (3.362e+09) [-1.365]	-4.638e+09	-8.737e+09	-1.036e+10 (1.005e+10) [-1.031]	-4.623e+09 (3.372e+09) [-1.371]	-2.601e+09 (2.228e+09) [-1.167]
$X_{2006-1999}$	-2.831e+09 (2.148e+09) [-1.318]	-5.584e+09	-8.758e+09	-4.207e+09 (3.241e+09) [-1.298]	-4.457e+09	-8.758e+09	-9.264e+09 (9.189e+09) [-1.008]	-4.226e+09 (3.189e+09) [-1.325]	-2.432e+09 (1.963e+09) [-1.239]
$X_{2007-1997}$	-3.649e+09 (3.088e+09) [-1.181]	-7.122e+09	-1.124e+10	-5.514e+09 (4.138e+09) [-1.333]	-5.721e+09	-1.124e+10	-1.288e+10 (1.242e+10) [-1.037]	-5.553e+09 (4.151e+09) [-1.338]	-3.146e+09 (2.875e+09) [-1.094]
$X_{2007-1999}$	-3.518e+09 (2.806e+09) [-1.254]	-7.060e+09	-1.129e+10	-5.159e+09 (4.095e+09) [-1.26]	-5.540e+09	-1.129e+10	-1.177e+10 (1.154e+10) [-1.02]	-5.185e+09 (4.036e+09) [-1.285]	-2.993e+09 (2.547e+09) [-1.175]
$X_{2008-1997}$	-4.501e+09 (4.104e+09) [-1.097]	-8.625e+09	-1.427e+10	-7.310e+09 (5.712e+09) [-1.28]	-7.440e+09	-1.427e+10	-1.811e+10 (1.759e+10) [-1.03]	-7.269e+09 (5.678e+09) [-1.28]	-3.761e+09 (3.710e+09) [-1.014]
$X_{2008-1999}$	-4.408e+09 (3.762e+09) [-1.172]	-8.595e+09	-1.436e+10	-6.917e+09 (5.784e+09) [-1.196]	-7.258e+09	-1.436e+10	-1.666e+10 (1.645e+10) [-1.013]	-6.869e+09 (5.678e+09) [-1.21]	-3.631e+09 (3.306e+09) [-1.099]
$X_{2009-1997}$	-3.930e+09 (3.204e+09) [-1.227]	-6.989e+09	-1.090e+10	-5.315e+09 (4.022e+09) [-1.321]	-5.554e+09	-1.090e+10	-1.254e+10 (1.224e+10) [-1.024]	-5.313e+09 (4.016e+09) [-1.323]	-3.328e+09 (2.810e+09) [-1.184]
$X_{2009-1999}$	-3.792e+09 (2.953e+09) [-1.284]	-6.903e+09	-1.094e+10	-5.092e+09 (4.122e+09) [-1.235]	-5.372e+09	-1.094e+10	-1.177e+10 (1.160e+10) [-1.014]	-5.083e+09 (4.066e+09) [-1.25]	-3.175e+09 (2.536e+09) [-1.252]
$X_{2010-1997}$	-5.082e+09 (4.537e+09) [-1.12]	-9.560e+09	-1.516e+10	-6.938e+09 (5.830e+09) [-1.19]	-7.384e+09	-1.516e+10	-1.778e+10 (1.769e+10) [-1.005]	-6.958e+09 (5.834e+09) [-1.193]	-4.264e+09 (4.031e+09) [-1.058]
$X_{2010-1999}$	-4.954e+09 (4.228e+09) [-1.172]	-9.509e+09	-1.526e+10	-6.752e+09 (6.038e+09) [-1.118]	-7.202e+09	-1.526e+10	-1.703e+10 (1.704e+10) [-.999]	-6.767e+09 (5.967e+09) [-1.134]	-4.094e+09 (3.656e+09) [-1.12]

Standard errors in brackets. All standard errors bootstrapped with 250 replications. Z values reported for the Kernel and Radius estimates and T-statistics reported for the Stratification estimates (these are reported in square brackets). All standard errors bootstrapped with 250 replications. Critical values $Z(\alpha = 0.05) = 1.96$; $Z(\alpha = 0.1) = 1.64$; $t_{60,0.1} = 1.296$; $t_{60,0.05} = 1.671$; $t_{75,0.1} = 1.293$; $t_{75,0.05} = 1.666$. Number of Treated=35; Control=26. Ratios are defined for each country i. Thus for example, $GSP_i/TotalImports_i$ can be the ratio of Country i's GSP imports out of total imports by the USA. Number of Controls=40; Treated = 35. The stratification matching did not work for the outcome variables presented here

Table 16: Matched Diff-in-Diff results for Mirror Export Shares (Model 1)

Outcome	K (bw=0.06)			K (bw=0.01)			K (bw=0.001)	R ($\delta = 0.05$)	R ($\delta = 0.01$)
	ATT	ATE	All	ATT	ATE	All	ATT	ATT	ATT
Share of Mirror Exports, USA									
$X_{2002-1997}$	-.0352 (.0283) [-1.247]	-.0426	-.0419	-.0303 (.0382) [-.795]	-.0282	-.0419	.0456 (.0657) [.693]	-.0291 (.0377) [-.772]	-.0369 (.0283) [-1.303]
$X_{2002-1999}$	.0007 (.0192) [.036]	-.0045	-.0131	.0006 (.0264) [.024]	.0001	-.0131	.049 (.0499) [.981]	.0022 (.026) [.084]	.0022 (.0182) [.12]
$X_{2003-1997}$	-.0304 (.0335) [-.908]	-.0312	-.0221	-.025 (.0498) [-.502]	-.0218	-.0221	.078 (.0848) [.92]	-.0228 (.0495) [-.462]	-.0313 (.033) [-.949]
$X_{2003-1999}$	.0049 (.0286) [.171]	.0064	.006	.0023 (.0356) [.065]	.0065	.006	.0807 (.0684) [1.181]	.0049 (.0353) [.138]	.0071 (.0282) [.253]
$X_{2004-1997}$	.0112 (.0381) [.295]	-.0125	0	.005 (.0615) [.081]	.0029	0	.0917 (.0777) [1.18]	.0077 (.0612) [.127]	.0106 (.0379) [.28]
$X_{2004-1999}$	.0446 (.0356) [1.254]	.0245	.0279	.032 (.0548) [.585]	.0312	.0279	.0934 (.0731) [1.278]	.0352 (.0546) [.645]	.047 (.035) [1.341]
$X_{2005-1997}$	.0238 (.044) [.541]	.0003	.0266	.0372 (.0685) [.543]	.0349	.0266	.0936 (.0727) [1.287]	.0393 (.068) [.579]	.0221 (.0435) [.508]
$X_{2005-1999}$	.0588 (.0368) [1.6]	.0386	.0541	.0644 (.0554) [1.163]	.0632	.0541	.0978 (.0701) [1.395]	.0669 (.0549) [1.218]	.0599 (.0361) [1.659]
$X_{2006-1997}$	.0155 (.0487) [.318]	-.0255	.0193	.0075 (.0761) [.099]	-.0076	.0193	.0411 (.0883) [.465]	.0099 (.0755) [.131]	.0143 (.0488) [.293]
$X_{2006-1999}$	.0495 (.0407) [1.215]	.0214	.0471	.0356 (.0614) [.58]	.0207	.0471	.0495 (.0815) [.608]	.0383 (.061) [.628]	.0508 (.0404) [1.257]
$X_{2007-1997}$	.0195 (.0509) [.383]	-.0198	.0266	.015 (.0815) [.184]	.0035	.0266	.0777 (.0856) [.908]	.0169 (.0811) [.208]	.0178 (.0505) [.352]

$X_{2007-1999}$	.055 (.0431) [1.277]	.0263	.0547	.043 (.0641) [.671]	.0318	.0547	.0865 (.0787) [1.099]	.0451 (.0637) [.708]	.0558 (.0426) [1.309]
$X_{2008-1997}$	.0309 (.0514) [.601]	-.0166	.042	.0249 (.0815) [.306]	.0078	.042	.0756 (.1) [.755]	.0261 (.0813) [.32]	.0288 (.0512) [.562]
$X_{2008-1999}$	.0656 (.0438) [1.498]	.0317	.07	.0529 (.0643) [.823]	.0361	.07	.0851 (.093) [.915]	.0542 (.0643) [.843]	.066 (.0436) [1.514]
$X_{2009-1997}$	.0315 (.0492) [.64]	-.0151	.0434	.0257 (.0806) [.319]	.0095	.0434	.0736 (.0964) [.763]	.0272 (.0803) [.339]	.0303 (.0487) [.622]
$X_{2009-1999}$	.0672 (.0442) [1.521]	.0339	.0718	.0545 (.0665) [.82]	.0378	.0718	.084 (.0888) [.946]	.0563 (.0663) [.849]	.0685 (.044) [1.555]
$X_{2010-1997}$	.0124 (.0446) [.277]	-.0232	.0261	.0073 (.0686) [.106]	-.0018	.0261	.0705 (.0774) [.91]	.0083 (.0685) [.121]	.0114 (.0437) [.26]
$X_{2010-1999}$	.0506 (.0396) [1.278]	.0252	.0553	.0377 (.0566) [.667]	.0265	.0553	.0806 (.0709) [1.136]	.0389 (.0566) [.687]	.0521 (.0388) [1.346]
Share of Mirror Exports, EU									
$X_{2002-1997}$	.0767 (.0638) [1.202]	.0425	.0117	.0858 (.0761) [1.126]	.0714	.0117	.0018 (.1525) [.012]	.0829 (.0765) [1.083]	.0775 (.0652) [1.187]
$X_{2002-1999}$	.0218 (.041) [.533]	.0049	-.0029	.0292 (.0544) [.538]	.0182	-.0029	-.0527 (.1309) [-.402]	.028 (.0542) [.518]	.0215 (.0416) [.518]
$X_{2003-1997}$	.0364 (.0654) [.556]	.0056	-.0313	.0375 (.0896) [.419]	.0231	-.0313	-.028 (.1305) [-.215]	.033 (.0903) [.366]	.0392 (.0669) [.586]
$X_{2003-1999}$	-.0185 (.0463) [-.399]	-.032	-.0459	-.019 (.0703) [-.271]	-.0301	-.0459	-.0824 (.1169) [-.705]	-.0218 (.0702) [-.311]	-.0167 (.0469) [-.357]
$X_{2004-1997}$	-.0033 (.0601) [-.056]	-.012	-.063	.0005 (.0904) [.006]	-.002	-.063	-.0507 (.132) [-.384]	-.0033 (.0911) [-.036]	-.0014 (.0609) [-.023]
$X_{2004-1999}$	-.0582 (.0402) [-1.448]	-.0496	-.0776	-.056 (.0675) [-.83]	-.0552	-.0776	-.1051 (.1192) [-.881]	-.0581 (.0675) [-.861]	-.0573 (.0401) [-1.429]
$X_{2005-1997}$	.0048 (.0652) [.074]	-.008	-.0574	.0221 (.0894) [.247]	.0155	-.0574	.0461 (.1121) [.411]	.0189 (.0901) [.209]	.0077 (.0643) [.12]
$X_{2005-1999}$	-.0501 (.0477) [-1.051]	-.0456	-.072	-.0345 (.0699) [-.493]	-.0378	-.072	-.0083 (.103) [-.081]	-.036 (.07) [-.514]	-.0483 (.0454) [-1.064]
$X_{2006-1997}$	.0049 (.0571) [.087]	-.0037	-.0607	.0254 (.0693) [.367]	.0272	-.0607	.0246 (.0821) [.3]	.0235 (.0699) [.336]	.0053 (.0585) [.091]
$X_{2006-1999}$	-.0499 (.0463) [-1.079]	-.0413	-.0753	-.0311 (.055) [-.565]	-.026	-.0753	-.0298 (.0855) [-.348]	-.0314 (.0551) [-.569]	-.0506 (.0469) [-1.08]
$X_{2007-1997}$	-.0154 (.064) [-.241]	-.0181	-.0753	.0155 (.0959) [.161]	.0025	-.0753	-.0522 (.0635) [-.822]	.0146 (.0962) [.151]	-.0125 (.0657) [-.191]
$X_{2007-1999}$	-.0703 (.0496) [-1.417]	-.0557	-.0899	-.0411 (.0828) [-.496]	-.0507	-.0899	-.1066 (.095) [-1.122]	-.0403 (.0828) [-.486]	-.0685 (.0507) [-1.35]
$X_{2008-1997}$	.0054 (.0665) [.082]	-.0056	-.0775	.0369 (.075) [.492]	.0381	-.0775	.0578 (.0874) [.661]	.0365 (.0754) [.484]	.0053 (.0667) [.08]
$X_{2008-1999}$	-.0494 (.0595) [-.83]	-.0432	-.0922	-.0196 (.0621) [-.316]	-.0152	-.0922	.0034 (.0892) [.038]	-.0184 (.0626) [-.293]	-.0506 (.0587) [-.862]
$X_{2009-1997}$	-.0005 (.0707) [-.007]	-.0164	-.0844	.022 (.0958) [.229]	.0154	-.0844	.0191 (.1057) [.181]	.0206 (.0966) [.213]	.0024 (.07) [.035]
$X_{2009-1999}$	-.0554 (.0568) [-.975]	-.054	-.099	-.0346 (.081) [-.427]	-.0378	-.099	-.0353 (.0884) [-.4]	-.0343 (.0813) [-.422]	-.0535 (.0551) [-.97]
$X_{2010-1997}$	.0073 (.0703) [.104]	-.0125	-.0808	.019 (.0932) [.204]	.0156	-.0808	.0128 (.0791) [.162]	.0175 (.094) [.186]	.0093 (.0704) [.133]
$X_{2010-1999}$	-.0475 (.056) [-.849]	-.0501	-.0954	-.0375 (.0772) [-.485]	-.0377	-.0954	-.0416 (.0556) [-.748]	-.0374 (.0775) [-.482]	-.0466 (.055) [-.847]
Share Mirror Exports, ROW									
$X_{2002-1997}$	-.0699 (.0687) [-1.017]	-.0375	.0101	-.0545 (.0848) [-.643]	-.0432	.0101	-.0576 (.1758) [-.328]	-.0531 (.0849) [-.626]	-.07 (.0692) [-1.012]
$X_{2002-1999}$	-.0249 (.0441) [-.564]	-.004	.0162	-.0307 (.0596) [-.515]	-.0183	.0162	0 (.1495) [0]	-.0308 (.0589) [-.522]	-.0258 (.043) [-.599]
$X_{2003-1997}$	-.0243 (.0705) [-.345]	-.0105	.0351	-.0062 (.0933) [-.066]	-.0014	.0351	-.0583 (.1591) [-.366]	-.0041 (.0937) [-.044]	-.0271 (.0708) [-.382]
$X_{2003-1999}$	.0124 (.0443) [.28]	.0225	.0402	.0123 (.0575) [.214]	.0236	.0402	-.0013 (.1267) [-.01]	.0128 (.0571) [.225]	.009 (.0436) [.207]
$X_{2004-1997}$	-.0185 (.068) [-.272]	-.0039	.0504	-.0002 (.0956) [-.002]	-.0009	.0504	-.0496 (.1642) [-.302]	.0006 (.0961) [.006]	-.0205 (.0683) [-.3]
$X_{2004-1999}$	.0125 (.0423) [.296]	.0237	.0502	.0173 (.0637) [.271]	.0241	.0502	.0096 (.1458) [.066]	.0164 (.0634) [.259]	.0099 (.0416) [.238]
$X_{2005-1997}$	-.0398 (.0745) [-.534]	-.0268	.0152	-.0462 (.1088) [-.425]	-.0504	.0152	-.1426 (.1389) [-1.026]	-.0454 (.1093) [-.416]	-.0412 (.0744) [-.554]
$X_{2005-1999}$	-.0077 (.0482) [-.159]	.0052	.019	-.0338 (.0681) [-.497]	-.0254	.019	-.0924 (.1097) [-.842]	-.0346 (.0678) [-.511]	-.0095 (.0462) [-.206]
$X_{2006-1997}$	-.0383 (.0767) [-.499]	-.0075	.026	-.0225 (.1012) [-.222]	-.0197	.026	-.0693 (.1205) [-.575]	-.0231 (.1013) [-.228]	-.037 (.0769) [-.481]
$X_{2006-1999}$	-.0002 (.0528) [-.004]	.0187	.0301	-.0065 (.0719) [-.09]	.0053	.0301	-.0209 (.1029) [-.203]	-.0087 (.0715) [-.121]	.0003 (.0524) [.006]
$X_{2007-1997}$	-.0225 (.0762) [-.295]	.0016	.0337	-.0173 (.1092) [-.159]	-.006	.0337	-.0281 (.1153) [-.243]	-.0184 (.109) [-.169]	-.0232 (.0762) [-.304]
$X_{2007-1999}$	.0148 (.0569) [.26]	.0282	.0366	-.0039 (.0869) [-.045]	.0189	.0366	.0162 (.1284) [.126]	-.0066 (.0866) [-.076]	.013 (.0569) [.228]
$X_{2008-1997}$	-.0467 (.0837) [-.558]	-.0144	.0213	-.0459 (.1086) [-.423]	-.0459	.0213	-.1353 (.145) [-.933]	-.0467 (.1084) [-.431]	-.0432 (.0834) [-.518]
$X_{2008-1999}$	-.012 (.0582) [-.207]	.0105	.023	-.0318 (.0742) [-.429]	-.0209	.023	-.0898 (.1119) [-.802]	-.0342 (.0742) [-.461]	-.0093 (.0572) [-.163]
$X_{2009-1997}$	-.0376 (.079) [-.476]	.0013	.0308	-.0299 (.1152) [-.259]	-.025	.0308	-.0982 (.1431) [-.686]	-.03 (.1156) [-.26]	-.0383 (.0784) [-.489]
$X_{2009-1999}$	-.0066 (.0583) [-.114]	.0207	.0289	-.02 (.088) [-.227]	0	.0289	-.0467 (.0955) [-.489]	-.0217 (.0881) [-.246]	-.008 (.0569) [-.141]
$X_{2010-1997}$	-.0308 (.0829) [-.372]	.0055	.0427	-.0061 (.1088) [-.056]	-.0137	.0427	-.0855 (.1217) [-.702]	-.0056 (.1091) [-.052]	-.031 (.0828) [-.374]
$X_{2010-1999}$	0 (.0585) [0]	.0242	.0404	.0022 (.0825) [.027]	.0112	.0404	-.0381 (.0723) [-.527]	.0011 (.0827) [.013]	-.0006 (.0577) [-.011]

Standard errors in brackets. All standard errors bootstrapped with 250 replications. Z values reported for the Kernel and Radius estimates and T-statistics reported for the Stratification estimates (these are reported in square brackets). All standard errors bootstrapped with 250 replications. Critical values $Z(\alpha = 0.05) = 1.96$; $Z(\alpha = 0.1) = 1.64$; $t_{60,0.1} = 1.296$; $t_{60,0.05} = 1.671$; $t_{75,0.1} = 1.293$; $t_{75,0.05} = 1.666$. Number of Treated=35; Control=26. Ratios are defined for each country *i*. Thus for example, $GSP_i/TotalImports_i$ can be the ratio of Country *i's* GSP imports out of total imports by the USA. Number of Controls=40; Treated = 35. The stratification matching did not work for the outcome variables presented here

4.5 Annual Outcomes

The annual outcomes are also calculated to show the annual variation in outcomes. Tables (17 & 18) report the annual *ATT* estimates for the outcome variables.

The first table in this section (table 17) reports the results for the shares. The shares have more significant estimates compared to the previous table for level estimates. the shares of mirror exports to ROW declined relative to the control countries. The decline ranges from 14.2% in 2001 to 11.6% in 2010. The share of mirror exports to the EU increased relative to the control countries. Significant estimates are recorded for all years except 2009 and for the kernel (bandwidth=0.01). The estimates reported by the default kernel and radius ($\delta = 0.05$) are quite similar. On the contrary, the estimates for the kernel (bandwidth=0.01) is twice that of the other two matching estimators. The share of mirror exports to the EU varies from 23.9% in 2001 to 15.7% in 2010. Results of the USA shares are not significant in any of the three columns. Turning to the composition of imports by the USA, the insignificance of the *gsp* shares is again noticeable. There is one exception—the 2004 estimate is significantly higher relative to the control countries in the second (6.9%) and fourth (6.95%) columns.

The remaining outcomes, share of *non–gsp* and *no programme* imports are significant for all years and across all three columns. Also noticeable, is that, the kernel (bandwidth=0.01) is no longer twice the estimate of the other matching estimates—it is now closer to the other estimates. This further confirms the robustness of the results. The share of *non–gsp* increases relative to the control countries from 7.8% in 2001 to 13.6% in 2011. Much of the increase in shares is observed between 2003 and 2006 (20.3%–29.3%). This is also consistent with the decline relative to the control countries of the *no programme* shares (21.8%–37.3%). The *no programme* shares decline relative to the controls from 12.1% in 2001 to 12.14% in 2011. As mentioned earlier, there are higher declines in between the period.

The *gsp*, *non–gsp*, mirror exports to the EU and mirror exports to the USA (and USA Imports, USITC) do not report any significant estimates in the final table (table 18). The default kernel estimate (bandwidth=0.06) has significant estimates for *no programme* imports in the year 2002–2005. The *no programme* imports declined relative to the counter-factual from US$ 800 million in 2002 to US$ 1,238 million in 2005. Mirror exports to ROW on the other hand reports significant declines relative to the control countries for all years except 2004, 2007, 2008 and 2010. The estimate varies from US$ 2,243 million in 2001 to US$ 6,190 million in 2009.

Table 17: Annual Results for Mirror Exports/Import Shares (Model 1)

Variable (Year)	Kernel (bw=0.06)	Kernel (bw=0.01)	Radius ($\delta = 0.05$)
Share of Mirror Exports, ROW			
2001 (N=74)	-.1417 (.0731) [-1.939]	-.2433 (.0805) [-3.024]	-.1453 (.0725) [-2.004]
2002 (N=74))	-.1545 (.0755) [-2.047]	-.2533 (.0915) [-2.769]	-.1581 (.0747) [-2.117]
2003 (N=74)	-.1214 (.0806) [-1.507]	-.2096 (.0976) [-2.148]	-.1268 (.0796) [-1.593]
2004	-.1152 (.0745) [-1.548]	-.1983 (.106) [-1.87]	-.1211 (.0752) [-1.611]
2005	-.1284 (.0722) [-1.779]	-.2404 (.0949) [-2.533]	-.133 (.0725) [-1.836]
2006	-.1259 (.068) [-1.851]	-.2173 (.0873) [-2.489]	-.1287 (.0692) [-1.861]
2007	-.1092 (.0705) [-1.55]	-.2036 (.0973) [-2.094]	-.1144 (.0711) [-1.609]
2008	-.1251 (.066) [-1.897]	-.2193 (.0892) [-2.457]	-.1261 (.0668) [-1.889]
2009	-.1158 (.0662) [-1.749]	-.205 (.1011) [-2.027]	-.1202 (.0659) [-1.823]
2010	-.1162 (.0607) [-1.915]	-.1943 (.0873) [-2.225]	-.1201 (.0609) [-1.972]
Share of Mirror Exports, EU			
2001	.1292 (.0755) [1.711]	.239 (.0887) [2.693]	.1326 (.075) [1.769]
2002	.1515 (.0797) [1.901]	.2513 (.0956) [2.629]	.1543 (.0791) [1.951]
2003	.1092 (.0777) [1.406]	.1989 (.0982) [2.025]	.1139 (.0776) [1.468]
2004	.0749 (.0738) [1.015]	.1656 (.0971) [1.705]	.079 (.0745) [1.062]
2005	.0797 (.0709) [1.124]	.1811 (.0908) [1.996]	.0839 (.0712) [1.179]
2006	.0862 (.0642) [1.342]	.184 (.0757) [2.432]	.0881 (.0656) [1.342]
2007	.0642 (.0661) [.971]	.1593 (.09) [1.769]	.0688 (.0659) [1.045]
2008	.0706 (.0545) [1.297]	.1608 (.0742) [2.166]	.0717 (.0564) [1.271]
2009	.0581 (.0608) [.954]	.1475 (.091) [1.62]	.0618 (.0602) [1.026]
2010	.0785 (.053) [1.48]	.1567 (.0821) [1.908]	.0815 (.0528) [1.545]
Share of Mirror Exports, USA			
2001 (N=74)	-.0031 (.0518) [-.06]	-.0024 (.0629) [-.038]	-.0019 (.0514) [-.036]
2002 (N=74)	-.0126 (.0493) [-.256]	-.0074 (.0599) [-.123]	-.0108 (.0492) [-.219]
2003 (N=74)	-.007 (.0527) [-.132]	-.0028 (.057) [-.049]	-.0048 (.0527) [-.092]
2004	.0403 (.0459) [.878]	.0327 (.0683) [.479]	.0421 (.047) [.897]
2005	.0487 (.0475) [1.024]	.0593 (.0682) [.869]	.0491 (.0483) [1.017]
2006	.0398 (.047) [.847]	.0332 (.07) [.475]	.0406 (.0476) [.853]
2007	.0451 (.0458) [.985]	.0443 (.0678) [.654]	.0455 (.0462) [.984]
2008	.0545 (.0425) [1.283]	.0584 (.0648) [.901]	.0544 (.043) [1.264]
2009	.0578 (.0406) [1.422]	.0575 (.0611) [.941]	.0584 (.041) [1.424]
2010	.0377 (.0358) [1.055]	.0376 (.0502) [.75]	.0386 (.0362) [1.065]
Share of Non–GSP out of Total Imports by USA from Country *i*			
2001 (N=74)	.0789 (.0338) [2.334]	.0918 (.0482) [1.905]	.0808 (.0342) [2.362]
2002 (N=74)	.157 (.0494) [3.177]	.1586 (.066) [2.403]	.1591 (.0505) [3.15]
2003 (N=74)	.2185 (.0515) [4.24]	.245 (.0661) [3.707]	.2204 (.0524) [4.208]
2004	.2931 (.0574) [5.106]	.3065 (.077) [3.983]	.2925 (.0579) [5.049]
2005	.2511 (.0572) [4.393]	.3028 (.0794) [3.813]	.2502 (.0579) [4.325]
2006	.2033 (.0524) [3.878]	.2043 (.0655) [3.119]	.2025 (.0529) [3.825]
2007	.188 (.0506) [3.712]	.2031 (.0671) [3.028]	.1864 (.051) [3.655]
2008	.167 (.0578) [2.891]	.16 (.0828) [1.932]	.1679 (.057) [2.945]
2009	.1548 (.053) [2.917]	.1604 (.0684) [2.345]	.154 (.0533) [2.888]
2010	.1444 (.0488) [2.959]	.1562 (.0601) [2.597]	.1438 (.0491) [2.931]
2011	.1368 (.048) [2.852]	.1367 (.0632) [2.163]	.1364 (.0481) [2.836]
Share of GSP out of Total Imports by USA from Country *i*			
2001 (N=70)	.0308 (.0541) [.568]	.0432 (.0908) [.475]	.0312 (.054) [.578]
2002 (N=70)	.0095 (.0522) [.182]	.0298 (.0833) [.358]	.012 (.0518) [.231]
2003 (N=70)	.0121 (.0666) [.182]	.029 (.107) [.271]	.0152 (.0655) [.232]
2004 (N=70)	.069 (.0371) [1.859]	.0837 (.0658) [1.273]	.0695 (.0377) [1.844]
2005 (N=70)	-.0292 (.0687) [-.424]	-.0344 (.0942) [-.365]	-.0275 (.0675) [-.407]
2006 (N=70)	-.0008 (.0698) [-.011]	.0163 (.0857) [.19]	.0025 (.0692) [.036]
2007 (N=70)	-.0388 (.0763) [-.509]	-.0348 (.0999) [-.349]	-.0361 (.075) [-.481]
2008 (N=70)	-.0024 (.0476) [-.051]	.0291 (.0634) [.46]	-.0034 (.0486) [-.07]
2009 (N=70)	.0111 (.038) [.292]	.0383 (.0633) [.605]	.0111 (.0386) [.288]
2010 (N=70)	-.0052 (.0247) [-.211]	-.0006 (.029) [-.022]	-.0055 (.0251) [-.218]
2011 (N=70)	-.0261 (.0256) [-1.017]	-.0109 (.0277) [-.395]	-.0263 (.0268) [-.98]
Share of No Program out of Total Imports by USA from Country *i*			
2001 (N=74)	-.121 (.056) [-2.161]	-.1668 (.0896) [-1.861]	-.122 (.0552) [-2.21]
2002 (N=74)	-.1781 (.0608) [-2.931]	-.2111 (.0899) [-2.348]	-.1811 (.0607) [-2.984]
2003 (N=74)	-.2437 (.0691) [-3.525]	-.3034 (.0987) [-3.074]	-.2467 (.0691) [-3.569]
2004	-.3732 (.0601) [-6.207]	-.4164 (.0895) [-4.651]	-.3727 (.0596) [-6.249]
2005	-.2414 (.0819) [-2.946]	-.314 (.1087) [-2.889]	-.2416 (.0807) [-2.993]
2006	-.2178 (.0796) [-2.737]	-.2543 (.0961) [-2.645]	-.2188 (.0787) [-2.779]
2007	-.167 (.0819) [-2.038]	-.2084 (.106) [-1.965]	-.1671 (.0802) [-2.083]
2008	-.179 (.0657) [-2.726]	-.2116 (.0989) [-2.139]	-.1795 (.0658) [-2.728]
2009	-.1733 (.0624) [-2.779]	-.2063 (.0827) [-2.494]	-.1723 (.0632) [-2.725]
2010	-.1498 (.0554) [-2.706]	-.1724 (.0676) [-2.55]	-.1486 (.0555) [-2.681]
2011	-.1214 (.052) [-2.333]	-.1401 (.0726) [-1.931]	-.1201 (.0516) [-2.326]

Bootstrapped Standard errors with 250 replications in brackets. Unless otherwise indicated N=75. Z values reported for the Kernel and Radius estimates and T-statistics reported for the Stratification estimates (these are reported in square brackets). Critical values $Z(\alpha = 0.05) = 1.96$; $Z(\alpha = 0.1) = 1.64$; $t_{70,0.1} = 1.294$; $t_{70,0.05} = 1.667$; $t_{75,0.1} = 1.293$; $t_{75,0.05} = 1.666$.

Table 18: Annual Results for Mirror Exports/Imports levels (Model 1)

Variable (Year)	Kernel (bw=0.06)	Kernel (bw=0.01)	Radius ($\delta = 0.05$)
No Program Imports			
2001	-655391173.09 (480400597.14) [-1.364]	-455538257.24 (498549971.9) [-.914]	-670795530.32 (540401562.9) [-1.241]
2002	-866873508.18 (493507538.96) [-1.757]	-637943685.59 (488677252.44) [-1.305]	-873198430.30 (557939238.32) [-1.565]
2003	-899227159.23 (557705729.87) [-1.612]	-614868228.14 (569709824.44) [-1.079]	-894659108.36 (618056228.68) [-1.448]
2004	-1114104465.76 (614123285.67) [-1.814]	-836023419.11 (560067401.51) [-1.493]	-1099525933.79 (678667195.04) [-1.62]
2005	-1238224767.79 (757847495.07) [-1.634]	-857017022.31 (745117346.84) [-1.15]	-1224583150.85 (829919811.26) [-1.476]
2006	-1210665073.26 (951625527.80) [-1.272]	-760067759.03 (1075099974.88) [-.707]	-1192789003.5 (1013175202.15) [-1.177]
2007	-1177116689.35 (1045670986.6) [-1.126]	-726810977.65 (1272856230.28) [-.571]	-1123397742.25 (1069945994.78) [-1.05]
2008	-857717596.38 (1267094132.41) [-.677]	-274217422.37 (1666175616.53) [-.165]	-780683586.41 (1257642459.83) [-.621]
2009	-1025966014 (942012010.03) [-1.089]	-641533141.46 (1133518504.72) [-.566]	-939412491.08 (913953655.57) [-1.028]
2010	-959649181.15 (1284277784.21) [-.747]	-519828380.24 (1744629424.29) [-.298]	-838951245.78 (1244591565.5) [-.674]
2011	-1021889733.25 (1463351233.83) [-.698]	-486336768.28 (2035594759.4) [-.239]	-855735776.83 (1398348261.36) [-.612]
GSP Imports			
2001 (N=70)	21987982.76 (76823949.85) [.286]	13391290.95 (140624200.78) [.095]	31418138.08 (75861000.18) [.414]
2002 (N=70)	7365389.63 (85393088.99) [.086]	-12323403.26 (169194792.38) [-.073]	20290336.7 (81515708.83) [.249]
2003 (N=70)	33403855.8 (115980491.2) [.288]	1932604.04 (233910080.54) [.008]	49901764.4 (111501350.82) [.448]
2004 (N=70)	15669824.46 (102956464.93) [.152]	-37476001.81 (209775680.3) [-.179]	36670807.53 (92999618.88) [.394]
2005 (N=70)	5933160.11 (136169776.78) [.044]	-63075688.95 (285688194.99) [-.221]	32519247.38 (124262780.82) [.262]
2006 (N=70)	32211469.11 (201557008.71) [.16]	-61292757.45 (431512660.45) [-.142]	67732523.42 (187373370.18) [.361]
2007 (N=70)	70527502.17 (199551807.1) [.353]	3499789.59 (398468623.76) [.009]	101148585.7 (191659903.29) [.528]
2008 (N=70)	1212270.29 (114997983.78) [.011]	-78887581.94 (217585514.5) [-.363]	24582116.28 (102181159) [.241]
2009 (N=70)	-31154671.54 (69026147.84) [-.451]	-98821274.48 (145409693.84) [-.680]	-13990184.04 (55421006.14) [-.252]
2010 (N=70)	-41268795.08 (80408411.2) [-.513]	-120156892.95 (152097388.94) [-.79]	-20323882.1 (62993711.62) [-.323]
2011 (N=70)	-65039130.27 (86220631.12) [-.754]	-148090583.08 (156875142.91) [-.944]	-42453995.43 (67402150.53) [-.63]
Non GSP Imports			
2001	133172683.55 (110383934.53) [1.206]	172196217.95 (184213556.24) [.935]	129408687.48 (112991946.82) [1.145]
2002	133007606.24 (88690876.42) [1.5]	162500029.16 (149296472.97) [1.088]	130825510.46 (90542784.58) [1.445]
2003	185175102.48 (149072390.82) [1.242]	220890430.11 (245829672.76) [.899]	180072563.02 (153039319.35) [1.177]
2004	506667586.43 (394776358.16) [1.283]	655459429.84 (659284429.55) [.994]	486520967.88 (403885321.93) [1.205]
2005	693321357.01 (558222133.86) [1.242]	939165633.13 (923066744.1) [1.017]	662382254.04 (570686720.12) [1.161]
2006	515669769.3 (460825186.69) [1.119]	742366622.67 (753503898.12) [.985]	483326196.28 (472785984.99) [1.022]
2007	595954294.15 (503180140.6) [1.184]	799570559.63 (828664604.25) [.965]	562011355.04 (516155631.82) [1.089]
2008	739974889.66 (543139197.68) [1.362]	1023338528.04 (883872955.27) [1.158]	708921767.75 (552982022.93) [1.282]
2009	295183580.74 (249068004.67) [1.185]	439266891.5 (398004993.15) [1.104]	278276249.89 (255354598.65) [1.09]
2010	354084490.97 (291731265.27) [1.214]	544221160.53 (463961368.78) [1.173]	334369487.78 (297928908.35) [1.122]
2011	396888386.2 (328723076.78) [1.207]	626548131.36 (520562523) [1.204]	372871772.92 (336220964.82) [1.109]
Mirror Exports EU			
2001	-587473297.52 (667297466.99) [-.88]	-580337578.94 (714249413.46) [-.813]	-535621747.48 (680752966.26) [-.787]
2002	-583934669.66 (646108063.30) [-.904]	-559378656.63 (633748739.69) [-.883]	-525826036.69 (656262235.79) [-.801]
2003	-864330750.37 (796592270.79) [-1.085]	-901424336.13 (864788831.92) [-1.042]	-793120137.33 (809683322.30) [-.98]
2004	-1205205431.91 (974501294.32) [-1.237]	-1255900318.83 (1005912459.48) [-1.249]	-1112176204.19 (983939409.87) [-1.13]
2005	-1276876594.05 (1195067581.28) [-1.068]	-1418336831.45 (1379220115.4) [-1.028]	-1164349669.92 (1195139480.27) [-.974]
2006	-1707270513.13 (1445455964.18) [-1.181]	-1829147807.89 (1752909171.23) [-1.043]	-1582683355.69 (1439741885.99) [-1.099]
2007	-2031257387.41 (1680956528.86) [-1.208]	-2070495377.82 (1833715136.84) [-1.129]	-1877467513.58 (1669369836.31) [-1.125]
2008	-2169314028.53 (2195477541.13) [-.988]	-2167635583.71 (2433401561.67) [-.891]	-1975744821.85 (2167276875.15) [-.912]
2009	-1903054069.31 (1511191454.13) [-1.259]	-1889729286.01 (1703086720.75) [-1.11]	-1723323731.58 (1465237446.58) [-1.176]
2010	-2483918976.98 (1872844161.12) [-1.326]	-2709421090.97 (2339014343.5) [-1.158]	-2265073770.69 (1823445925.96) [-1.242]
Mirror Exports USA			
2001 (N=74)	-560643457.56 (547239796.45) [-1.024]	-280998789.82 (696418979.62) [-.403]	-556692202.76 (571447746.38) [-.974]
2002 (N=74)	-797324953.38 (535551871.08) [-1.489]	-524432034.39 (668952025.41) [-.784]	-775274108.02 (554862793.32) [-1.397]
2003 (N=74)	-779526428.99 (652257428.01) [-1.195]	-424250821.92 (881264330.45) [-.481]	-737432313.36 (663003898.21) [-1.112]
2004	-593211432.01 (856946427.48) [-.692]	-145204951.55 (1140203868.28) [-.127]	-578634277.09 (899866786.59) [-.643]
2005	-542637948.24 (1148271916.31) [-.473]	118545694.33 (1630365343.81) [.073]	-534745209.42 (1190401521.61) [-.449]
2006	-653959635.89 (1355728445.29) [-.482]	70659865.77 (1939458412.66) [.036]	-635158435.85 (1385537929.95) [-.458]
2007	-501809191.57 (1511827154.44) [-.332]	228468198.42 (2194280622.74) [.104]	-452420877.4 (1516451508.63) [-.298]
2008	-120995816.04 (1787572197.86) [-.068]	756011072.64 (2614929453.25) [.289]	-49439570.59 (1769456533.92) [-.028]
2009	-777917186.09 (1157467109.97) [-.672]	-263542444.86 (1555892663.66) [-.169]	-688728992.19 (1121057231.77) [-.614]
2010	-679710539.39 (1562216236.5) [-.435]	-76826473.45 (2243144278.33) [-.034]	-552861277.77 (1513121313.06) [-.365]
Mirror Exports ROW			
2001 (N=74)	-2243693115.41 (1283388461.35) [-1.748]	-2727888136.19 (1541570927.26) [-1.77]	-2219213885.27 (1394229056.17) [-1.592]
2002 (N=74)	-2291960653.67 (1377934100.23) [-1.663]	-2675773520.75 (1454174351.34) [-1.84]	-2253621879.58 (1488807952.05) [-1.514]
2003 (N=74)	-2948475916.9 (1674238865.42) [-1.761]	-3684363607.58 (2076372172.4) [-1.774]	-2876817404.12 (1789315799.49) [-1.608]
2004	-3594987736.06 (2307204349.54) [-1.558]	-4285638372.49 (2812874193.96) [-1.524]	-3536539873.04 (2546322310.35) [-1.389]
2005	-4434755039.28 (2666687765.32) [-1.663]	-5545249351.85 (3561872350.32) [-1.557]	-4317800506.46 (2896305625.9) [-1.491]
2006	-5305809019.97 (3232908124.52) [-1.641]	-7233516011.82 (5214469158.97) [-1.387]	-5141739938.58 (3451768365.39) [-1.49]
2007	-6141410475.57 (3855789973.38) [-1.593]	-8328652412.74 (6071599794.36) [-1.372]	-5924744765.49 (4091604860.21) [-1.448]
2008	-7296215344.32 (4801521158.49) [-1.52]	-10827937561.28 (8189222479.59) [-1.322]	-6918737565.6 (4987766444.42) [-1.387]
2009	-6190084403.14 (3765354574.58) [-1.644]	-7882528650.91 (5426931487.96) [-1.452]	-5913041610.06 (3926814772.16) [-1.506]
2010	-7724709189.38 (5028744276.07) [-1.536]	-9851279628.24 (7331414117.53) [-1.344]	-7356019822.69 (5232804929.49) [-1.406]
USA Imports,USITC			
2001	-479089144.47 (544834815.62) [-.879]	-198291342.9 (653714067.83) [-.303]	-491203729.43 (596352696.55) [-.824]
2002	-702066319.06 (539788955.67) [-1.301]	-409864355.42 (619163897.41) [-.662]	-700827399.19 (593801010.80) [-1.18]
2003	-650526101.06 (658018457.96) [-.989]	-286719056.63 (805038966.92) [-.356]	-638403369.20 (703815864.6) [-.907]
2004	-567209961.71 (823544296.56) [-.689]	-131705415.54 (1079461872.28) [-.122]	-556076902.41 (869532605.81) [-.64]
2005	-504635791.23 (1107697920.67) [-.456]	137312385.08 (1560548278.14) [.088]	-501019302.7 (1153128783.76) [-.434]
2006	-614305726.65 (1307804230.09) [-.47]	96080562 (1861216079.18) [.052]	-600893508 (1341604323.99) [-.448]

2007	-462024140.96 (1461904896.96) [-.316]	249300184.12 (2118556172.69) [.118]	-418401548.5 (1470632311.07) [-.285]
2008	-86421474.95 (1726841705.54) [-.05]	763886162.21 (2525180333.62) [.303]	-21885497.32 (1713689072.46) [-.013]
2009	-747321281.44 (1115802709.34) [-.67]	-248512532.58 (1496002699.92) [-.166]	-663690669.98 (1084046010.21) [-.612]
2010	-632382484.74 (1506073059.39) [-.42]	-48035169.48 (2167786157.66) [-.022]	-514383399.25 (1463582728.08) [-.351]
2011	-677920271.94 (1700956658) [-.399]	29179448.53 (2483651220.57) [.012]	-517404025.18 (1636068893.89) [-.316]

Bootstrapped Standard errors with 250 replications in brackets. Unless otherwise indicated N=75. Z values reported for the Kernel and Radius estimates and T-statistics reported for the Stratification estimates (these are reported in square brackets). Critical values $Z(\alpha = 0.05) = 1.96$; $Z(\alpha = 0.1) = 1.64$; $t_{70,0.1} = 1.294$; $t_{70,0.05} = 1.667$; $t_{75,0.1} = 1.293$; $t_{75,0.05} = 1.666$.

Figure (7) plots the annual estimates for *no programme* and *non–gsp* shares for each year. Given the close similarity in estimates for the shares of *non–gsp* and *no programme* imports across the estimators, the annual estimates of the Kernel (bandwidth=0.06) are shown in figure (7). In addition, these two are shown in the figure since their annual effect estimates are significant throughout the period. The discussion earlier pointed towards higher estimates between 2002 and 2006 and this is evident in the figure. After 2006, the decline in magnitude is probably influenced by the financial crisis and recession that the USA experienced—thereby leading to lower imports. Figure (8) on the other hand, plots the means of the annual estimates for these shares as well as the share of mirror exports to ROW. The mean annual shares for the period are consistent with the estimates reported in tables (4 – 7) in section (4.2). This highlights that averaging the *post-agoa* period did not affect the estimates obtained.

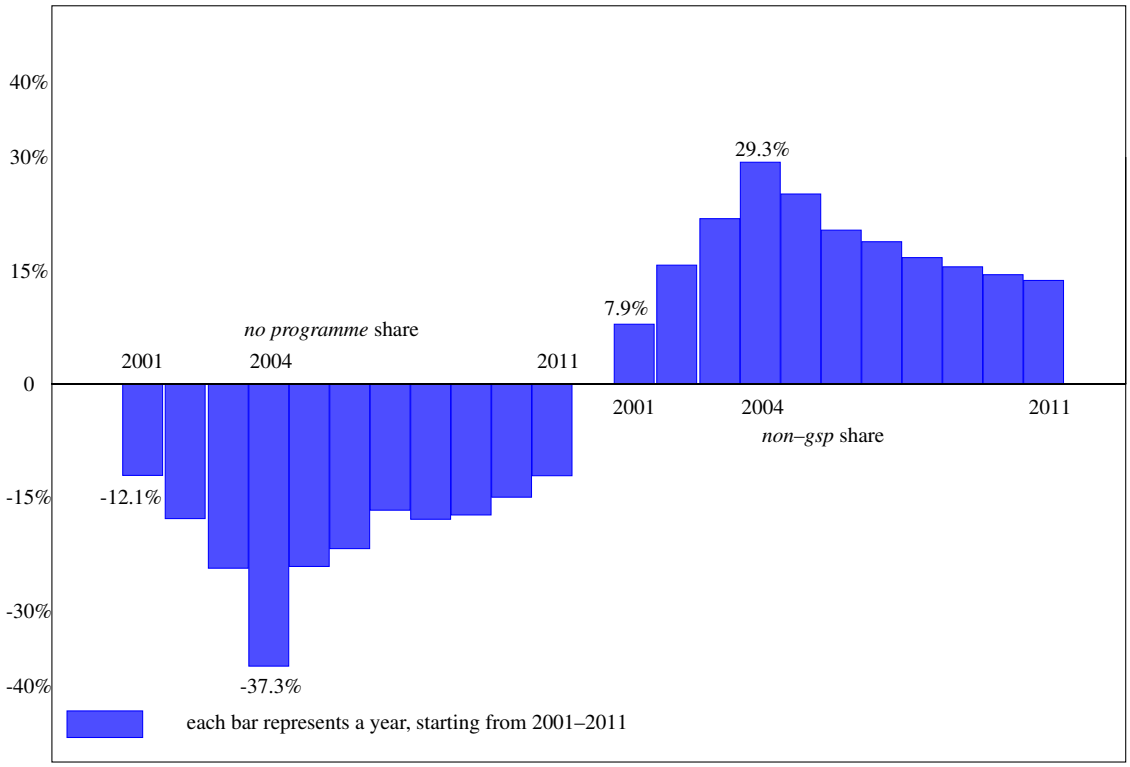


Figure 7: Kernel (bandwidth=0.06) annual ATT estimates for *non–gsp* and *no programme* shares based on Table (17), 2001–2011

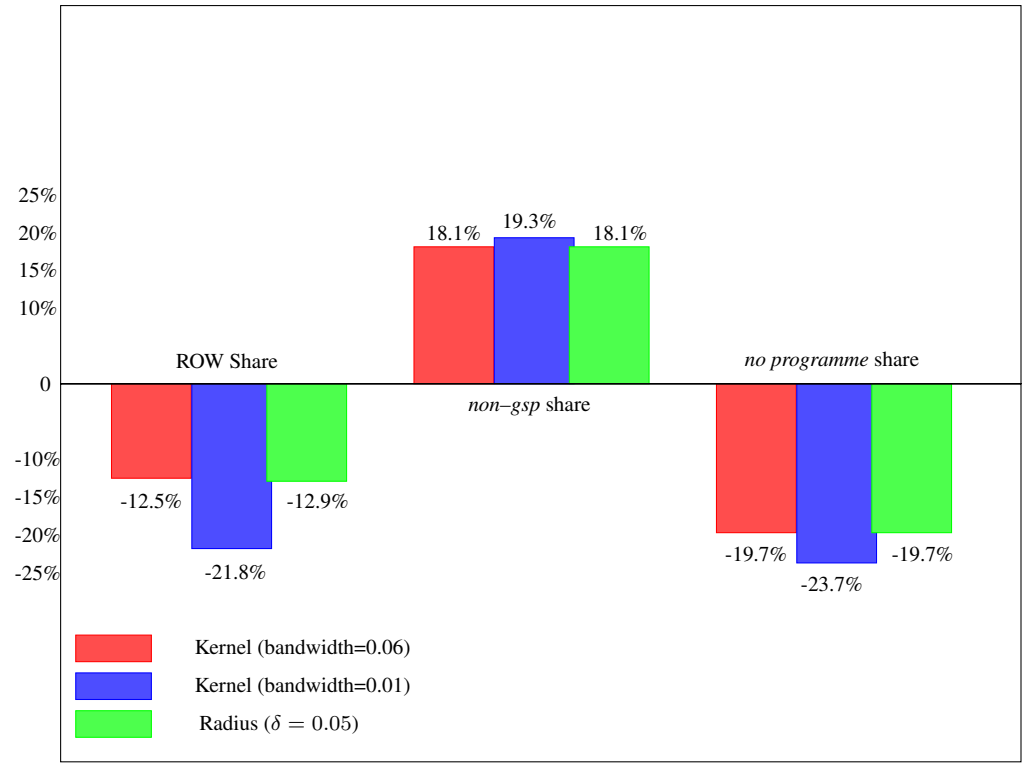


Figure 8: Average Annual *ATT* Estimates (2001-2011) based on Table (17)

4.6 Sensitivity tests of outcome variables

This section highlights the results of the sensitivity tests carried out to test the robustness of the *ATT* estimates presented in the previous sections. Table (19) presents the sensitivity analysis for the *ATT* estimates reported in tables (4–7 & 14–15). The base outcomes are the kernel (bandwidth=0.06) estimates reported in the tables above. The *ATT* estimates based on the simulated unobserved effects are also based on the kernel (bandwidth=0.06) estimator.

The sensitivity results reported in table (19) provide the odds of a confounder (unobserved factor) affecting the *ATT* estimates. As long as the *ATT* estimates are not driven down to zero the presence of any confounders have not significantly altered the results. In this case, different confounders are not experimented. However, the comparison is made across models. To account for this, the sensitivity analysis reported in the appendix further analyses model 1 and varies the effects of the unobserved factors by having several gamma values in the table. All three tables (tables 19 & 26–27) allow the model to be checked for any influence from the unobserved factors. However, they are based on different assumptions and modelling frameworks (these are presented in the footnotes to the respective tables).

The sensitivity analysis for the levels and shares for the various USA import categories in table (4–7) are similar to the *ATT* estimated by simulating the unobserved effects reported in table (19). On the contrary, results for the mirror exports are affected by the simulated unobserved factors. Mirror exports to the EU, USA and ROW are 26%, 78%

and 26% higher than the base *ATT* estimates respectively (calculated as [base *ATT* – simulated *ATT*]/base *ATT*). The result for the USA is almost twice the base *ATT* indicating that the outcome and selection effects of the order 4.69 and 2.81 respectively are enough to exaggerate the treatment effect.

The shares on the hand are 1%, 18% and 4.8% higher for the EU, USA and Row respectively. Again, the USA has the highest increase based on the simulated unobserved effects. However, relative to the levels, output and selection effects larger than four are required to have a similar effect to the levels. For model 2, the *ATT* based on the simulated unobserved effects are much closer to the baseline *ATT* reported. Thus, 9%, 20.8% and 10.3% of the baseline estimates are explained by the simulated unobserved effects. Again, the shares produce smaller discrepancies between the *ATT* reported. This is 6% for the EU—however, for the USA and ROW the simulated unobserved effects increase the *ATT* estimates by 20.4% and 1.6% respectively.

The simulated unobserved effects so far in this section have shown that apart from mirror exports to the USA (levels), they are quite robust to the simulated unobserved effects. For these outcomes, output and selection effects much larger than four are required to reduce the estimated *ATT* to zero. On the other hand, small output and selection effects of the order of approximately four and three are just enough to almost double the baseline *ATT* estimate. A caveat for for the simulation exercise is that, the simulated unobserved effects are based on a binary transformation of the continuous outcomes used in the study. In addition, rounding up of the shares in some cases exaggerate some of the results. To get around these, Rosenbaum's bounds analysis is implemented next with the results shown in the appendix. Not only do these tables show the sensitivity of the results but also, all the various models run previously have provided different ways of looking at the impact of the preference on the beneficiaries.

The sensitivity analysis in table (26–27) tests for effects of the unobserved effects present in the model to see if they affect the estimated *ATT*. Much of the results shown for the two tables tend to move in the same direction. The results so far point to selection on observables being satisfied. However, it is expected that, the sensitivity results presented in this section would help in answering the question of whether one should be worried about the presence of "selection on unobservables."

The difference between tables (26 & 27) is the size of the *caliper* used. Table (26) is based on the nearest neighbour matching with a *caliper* of 0.05 while table (26) is based on a *caliper* of 0.01. Table (26) has *non-gsp* shares, *non-gsp* level (2002–1997), mirror export shares to the EU (2002–1997), and mirror export shares (2010–1999) have higher gamma values than the remaining outcomes. The *non-gsp* shares have the highest gamma value of 4—indicating that a high level of unobserved effects is required to affect the outcome recorded. The three remaining outcomes have values less than 2—indicating they are less robust to the unobserved effects compared to the *non-gsp* shares. However, they are more robust than the remaining outcomes that are not significant. The significance level used here is the 5% level. Using the 10% level would increase

the value of gamma reported for the significant outcomes. In addition, *non-gsp* levels become significant at a gamma value less than 1.4.

The results reported in table (27) show similar upper and lower probability values with the exception of *non-gsp* levels being significant at a gamma value of 2 at the 5% level of significance. On the contrary, *non-gsp* levels (2002–1997) are significant at a lower value of gamma. The mirror export shares to the EU and USA that were significant are no longer significant for the case where the *caliper* is 0.01. Nonetheless, *non-gsp* levels (2010–1999) in the earlier table was not significant but is now significant at the 1.5 gamma value. Rosenbaum (1991a,b) notes that having high values of gamma is not a sufficient condition to rule out the presence of unobserved factors (Rosenbaum, 1991a,b). Likewise having low values of gamma may not always imply that there are unobserved factors. Moreover, a low value of gamma does not also rule out that the confounders might not be present. Thus, these results are not the ultimate answer to the problem of unobserved effects but do help in checking for problems and in accepting the possibility of unobserved factors driving the results (Rosenbaum, 1991a,b). From the results presented so far, there is some indication of the presence of unobserved effects. However, in majority of the cases it is not enough to drive the estimated effects to zero. This removes the doubts hanging over the significant estimates and one can be confident in the the effects presented so far.

Table 19: Main Text: Sensitivity Analysis for Levels and Import share (All models)

Variable	ATT	Output Effect	Selection Effect
Model 1			
No programme	-1.349e+09	4.845	3.348
GSP Imports	-66442312	4.82	2.512
Non-GSP Imports	3.924e+08	4.485	3.941
Non-GSP/Total Imports	.191	4.564	3.832
GSP/TT Imports	.014	4.716	2.443
No Programme/Total Imports	-.215	5.179	1.644
Mirror export Share ROW	-.13	4.597	2.148
Mirror export Share EU	.091	4.396	3.207
Mirror export Share USA	.039	4.451	2.693
Mirror exports, EU	-1.868e+09	4.424	3.003
Mirror exports, USA	-1.057e+09	4.69	2.809
Mirror exports, ROW	-6.140e+09	4.801	3.573
No programme (2002–1997)	-6.515e+08	4.64	3.612
Imports, USA (USITC) (2002–1997)	-4.523e+08	5.358	3.702
Non-GSP imports (2002–1997)	1.362e+08	5.088	4.077
GSP imports (2002–1997)	61417588	4.67	2.504
Mirror exports, EU (2002–1997)	-2.234e+08	4.831	3.633
Mirror exports, USA (2002–1997)	-4.963e+08	4.645	3.749
Mirror exports, ROW (2002–1997)	-8.251e+08	4.522	3.192
Model 2			
No programme	-1.253e+09	4.423	3.453
GSP Imports	-2.004e+08	4.125	2.568
Non-GSP Imports	4.131e+08	5.198	3.619
Non-GSP/Total Imports	.203	4.95	4.223
GSP/Total Imports	-.033	4.541	2.417
No Programme/Total Imports	-.175	5.317	1.76
Mirror export share, ROW	-.19	4.659	2.035
Mirror export share, EU	.125	4.518	3.178
Mirror export share, USA	.065	4.407	2.469
Mirror export, EU	-1.547e+09	4.363	2.897
Mirror export USA	-1.049e+09	4.321	2.784
Mirror export, ROW	-7.153e+09	5.132	2.906
Model 3			
No programme Imports	-1.285e+09	4.609	3.213
GSP Imports	-1.954e+08	4.611	2.534
Non-GSP Imports	4.182e+08	4.703	3.936
Non-GSP/Total Imports	.203	4.296	3.576
GSP/Total Imports	-.038	4.554	2.465
No Programme/Total Imports	-.17	5.358	1.876

The methods here are described in Ichino et al. (2006) and Nannicini (2007). 100 replications are conducted. The binary transformation is based on the mean value of each outcome (Y). The simulation is based on the following assumptions of the confounder, $P_{11} = Pr(U = 1|I(Y > \bar{Y}) = 1, T = 1) = 0.60$; $P_{10} = Pr(U = 1|I(Y > \bar{Y}) = 1, T = 0) = 0.50$; $P_{01} = Pr(U = 1|I(Y > \bar{Y}) = 1, T = 0) = 0.50$; $P_{00} = Pr(U = 1|I(Y > \bar{Y}) = 0, T = 0) = 0.2$; $P_{1.} = Pr(U = 1|T = 1) = 0.52$; $P_{0.} = Pr(U = 1|T = 0) \equiv 0.23 - 0.26$. The output effect is the average odds ratio of U based on a logit model of $Pr(I(Y > \bar{Y}) = 1|T = 0, U, W)$. The selection effect is the average odds ratio of U based on $Pr(T = 1|U, W)$. T is the treatment, W is the observable vector of covariates and U is the unobserved (or confounding) factors. Output effect $= \frac{Pr(I(Y>\bar{Y})=1|T=0,U=1,W)}{Pr(I(Y>\bar{Y})=0|T=0,U=1,W)} / \frac{Pr(I(Y>\bar{Y})=1|T=0,U=0,W)}{Pr(I(Y>\bar{Y})=0|T=0,U=0,W)}$. Selection effect $= \frac{Pr(T=1|U=1,W)}{Pr(T=0|U=1,W)} / \frac{Pr(T=1|U=0,W)}{Pr(T=0|U=0,W)}$.

5 Discussion

In summary, shares for the various categories of USA imports and shares out of the total mirror exports to the EU, USA and ROW tend to provide more significant and well-determined coefficients. The level outcome variables are not well-determined and do a poor job in providing the a priori treatment impacts expected. Some explanations for this can be due to the presence of heterogeneous impacts, unobserved heterogeneity which the sensitivity tests and Rosenbaum's bounds tests tend to indicate are present in some cases. On the contrary, when the shares are used the heterogeneity in impact and the unobserved heterogeneity are reduced and their effect is not as significant as in the levels case.

The poor performance of the levels can be attributed to a number of reasons. For instance, one cannot completely rule out the presence of unobserved factors. Secondly, the response by *agoa* recipients is quite heterogeneous. The uptake of preferences has not been the same across the beneficiaries—as well as some beneficiaries export relatively larger volumes of products while majority export less than US$ 1 million. One

could also argue that the distance from the USA (even though this has been controlled for in the propensity score regression) provides the Caribbean countries a competitive edge over the *SSA* counterparts—hence the negative *ATT* estimates in some cases. In other words, controlling for distance does not control for transport costs. Hence, transport costs might an observed factor that needs to be controlled for the level regressions to account for the poor results. Besides, the level of imports from majority of the *agoa* beneficiaries are smaller relative to the other countries. Nonetheless, given the small base of exports, their exports to the USA has shot up—hence their importance which is represented by the positive increases in the share of exports to the USA. This might explain why the shares perform better and show a positive increase in favour of exports to the EU and USA as well as for *non–gsp* exports. A probable reason for this is that, the shares clean up much of the unobserved factors driving the results seen for the levels. In addition, transport costs are not important in explaining the shares. It is the belief of the author that, the positive regression estimates reported in the empirical literature are an artefact of the importance of USA shares in the exports of the *agoa* beneficiaries.

The product results are consistent with the empirical literature in some cases. The caveat here is that the mirror exports for the products are based on total product exports and does not consider exports under *agoa* specifically. An analysis on the product exports under the various USA import categories might point towards higher level exports or shares. The results are much closer to Collier and Venables (2007) who compared all apparel and textile exports to the USA relative to the EU—and found higher apparel and textile exports to the USA relative to the EU. Also Tadesse and Fayissa (2008) used the total volume of exports for their product categories. Although apparel and textiles and a number of other products are not significant in this study the similarity is in the definition of the mirror export volume used—which includes non *agoa* exports. On the contrary, the work of Frazer and Van Biesebroeck (2010) focussed on exports under *agoa* and hence there are some differences in the results obtained. For the results to be consistent with Frazer and Van Biesebroeck (2010) products not covered by *agoa* must be excluded.

Moving to the general results, the diversion of exports from ROW to *agoa* beneficiaries is contrary to Frazer and Van Biesebroeck (2010) who suggested that *agoa* exports were not diverted from other destinations. Nevertheless, for product exports there were cases of diverted exports from the EU, however, the main cases of diversion occurred for destinations where existing export shares were already low.

In summarising the results the following facts arising from the analysis is presented below.

1. *Agoa* beneficiaries have not experience rapid increases in their exports relative to the counter-factual
2. *Agoa* beneficiaries have had a better performance relative to the counter-factual in terms of their exports to the EU.
3. The value of their exports to the rest of the world has also suffered relative to the

counter-factual

4. The shares of exports to the EU has also significantly increased compared to the counter-factual.
5. The same cannot be emphatically concluded for their exports to the USA. They do however, in some cases show some promise.
6. The share of exports to the rest of the world has gone down relative to the control countries and this result tends to be beyond doubt.
7. The increase in exports has been concentrated in the extractive industries for the USA relative to the control countries.
8. The iron, steel and other metals sector has also been at the center of the increase in exports to the EU relative to the counter-factual set of countries.
9. The remaining products have not been well-determined. Surprisingly, the textile, apparel, leather and footwear sector has not shown any significant increases for *agoa* beneficiaries.

6 Conclusion

This paper has adopted a matching framework to estimate the impact of the *agoa* policy of the USA on the exports of the beneficiary countries. The performance of the *agoa* beneficiaries have been compared to a set of countries that are quite similar to the *agoa* countries. These countries form the counter-factual for the performance of the outcome variables.

The results show that *agoa* successfully increased the shares of exports in the beneficiary countries. The increase in shares mostly occurred within exports to the USA. A large part of the increase in shares was obtained from from exports that previously did not receive any *gsp* preferences. These were significant with the right signs in most cases. The *gsp* preferences were not significant in most cases. The levels also provide a similar result but not as robust as the shares. On the other hand, the exports to the USA and EU have seen an increase in their shares while that of ROW has gone down. The levels again are not well determined and are not significant in most cases.

Further analysis carried out using a difference-in-difference matching analysis did support the earlier results. The difference in shares of *non-gsp* exports increased relatively more than the difference in the outcome outcome of the counter-factual. The *no programme* shares exhibited a decline relative to the control countries. The levels for all the outcomes and the shares of exports to the three destinations did not yield several significant estimates.

The final set of results compared the annual outcomes over the levels and shares for both the various mirror exports to the USA and exports to the three destinations explored. The shares of mirror exports to the EU increased significantly for most of the period while that of ROW declines significantly throughout the period. No significant

estimates are recorded for mirror exports to the USA. The picture for the composition of imports by the USA is different. The levels for *gsp* and *non-gsp* imports were not significant while that of *no-programme* imports significantly declined for most of the *post-agoa* period. The shares recorded significant estimates for *non-gsp* and *no-programme* imports. The shares for *non-gsp* increased throughout the period with larger shares recorded between 2003 and 2006. The shares for *no-programme* exports declined during the period. Again, the decline for 2003–2006 showed larger reductions relative to the counter-factual.

This confirms results reported in earlier studies showing an increase in exports to the USA. The departure however, is that, the results here point towards increasing shares but is unable to unambiguously show that the level of exports increased. The poor performance of the level outcomes requires further post matching analysis on the matched countries.

References

A. Abadie and G. Imbens. Simple and bias-corrected matching estimators for average treatment effects. *NBER Working Paper*, (0283), 2002. doi: www.nber.org.

A. Abadie and G. Imbens. Bias-corrected matching estimators for average treatment effects. *Journal of Business & Economic Statistics*, (1), 2011. doi: 10.1198/jbes.2009.07333.

Alberto Abadie, David Drukker, Jane Leber Herr, and Guido W. Imbens. Implementing matching estimators for average treatment effects in stata. *Stata Journal*, (1):1–18, 2001.

Fredoun Z. Ahmadi-Esfahani. Constant market shares analysis: uses, limitations and prospects. *Australian Journal of Agricultural and Resource Economics*, 50 (4):510–526, December 2006. ISSN 1467-8489. doi: 10.1111/j.1467-8489.2006.00364.x. URL `http://onlinelibrary.wiley.com/doi/10.1111/j.1467-8489.2006.00364.x/abstract`.

Andrew B. Bernard and J. Bradford Jensen. Why some firms export. *Review of Economics and Statistics*, 86(2):561–569, May 2004. doi: 10.1162/003465304323031111. URL `http://dx.doi.org/10.1162/003465304323031111`.

Andrew B. Bernard, J. Bradford Jensen, Stephen J. Redding, and Peter K. Schott. Firms in international trade. *The Journal of Economic Perspectives*, 21(3):105–130, 2007. ISSN 08953309. URL `http://www.jstor.org.ezproxy.sussex.ac.uk/stable/30033737`.

Andrew B. Bernard, J. Bradford Jensen, Stephen J. Redding, and Peter K. Schott. Wholesalers and retailers in U.S. trade (Long version). *National Bureau of Economic*

Research Working Paper Series, No. 15660, 2010. URL http://www.nber.org/papers/w15660.

Marco Caliendo and Sabine Kopeinig. Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys*, 22(1): 31–72, February 2008. ISSN 1467-6419. doi: 10.1111/j.1467-6419.2007.00527.x. URL http://onlinelibrary.wiley.com/doi/10.1111/j.1467-6419.2007.00527.x/abstract.

Paul Collier and Anthony J. Venables. Rethinking trade preferences to help diversity african exports, 2007. URL http://www.cepr.org/pubs/PolicyInsights/CEPR_Policy_Insight_002.asp.

N. Condon and M. Stern. The effectiveness of african growth and opportunity act (AGOA) in increasing trade from least developed countries: a systematic review. 2011. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

C. A. Cooper and B. F. Massell. A new look at customs union theory. *The Economic Journal*, 75(300):742–747, December 1965. ISSN 0013-0133. doi: 10.2307/2229672. URL http://www.jstor.org/stable/2229672.

Thomas A DiPrete and Markus Gangl. Assessing bias in the estimation of causal effects: Rosenbaum bounds on matching estimators and instrumental variables estimation with imperfect instruments. *Sociological Methodology*, 34(1): 271–310, December 2004. ISSN 1467-9531. doi: 10.1111/j.0081-1750.2004.00154.x. URL http://onlinelibrary.wiley.com/doi/10.1111/j.0081-1750.2004.00154.x/abstract.

Jan Fagerberg and Gunnar Sollie. The method of constant market shares analysis reconsidered. *Applied Economics*, 19(12):1571–1583, 1987. ISSN 0003-6846. doi: 10.1080/00036848700000084. URL http://www.tandfonline.com/doi/abs/10.1080/00036848700000084.

Garth Frazer and Johannes Van Biesebroeck. Trade growth under the african growth and opportunity act. *Review of Economics and Statistics*, 92(1):128–144, February 2010. doi: 10.1162/rest.2009.12111. URL http://dx.doi.org/10.1162/rest.2009.12111.

GAO. U.S. trade preference programs provide important benefits, but a more integrated approach would better ensure programs meet shared goals. Technical report, GAO, Washington D. C., March 2008. GAO Report.

Shenyang Guo and Mark W. Fraser. *Propensity Score Analysis: Statistical Methods and Applications*. Advanced Quantitative Techniques in the Social Sciences. SAGE Publications, Inc, 2010. ISBN 9781412953566.

Gordon Hanson. Sources of export growth in developing countries. Mimeo, [accessed May 19, 2012], February 2010. URL http://wise.xmu.edu.cn/Master/News/NewsPic/201011241720650.pdf.

Andrea Ichino, Fabrizia Mealli, and Tommaso Nannicini. From temporary help jobs to permanent employment: What can we learn from matching estimators and their sensitivity? CEPR Discussion Paper 5736, C.E.P.R. Discussion Papers, 2006. URL http://ideas.repec.org/p/cpr/ceprdp/5736.html.

Murray C. Kemp and Henry Y. Jr. Wan. An elementary proposition concerning the formation of customs unions. *Journal of International Economics*, 6(1):95–97, February 1976. ISSN 0022-1996. doi: 10.1016/0022-1996(76)90025-8. URL http://www.sciencedirect.com/science/article/pii/0022199676900258.

Shahidur R. Khandker, Gayatri B. Koolwal, and Hussain A. Samad. *Handbook on impact evaluation: quantitative methods and practices*. The World Bank, 2010.

Pravin Krishna. Are regional trading partners Natural? *Journal of Political Economy*, 111(1):202–226, February 2003. ISSN 0022-3808. URL http://www.jstor.org/stable/10.1086/344802.

Pravin Krishna. *Trade Blocs: Economics and Politics*. Cambridge University Press, New, 2005.

Pravin Krishna. Preferential trade agreements and the world trade system: A multilateralist view. *National Bureau of Economic Research Working Paper Series*, No. 17840, 2012. doi: presentedat"GlobalizationinanAgeofCrisis",September14-16,2011. URL http://www.nber.org/papers/w17840.

Edward E. Leamer and Robert M. Stern. *Quantitative International Economics*. Allyn and Bacon, Inc., Boston, 1970.

D. Lederman and C. Özden. Geopolitical interests and preferential access to U.S. markets. *Economics and Politics*, 19(2):235 – 258, june 2007. doi: http://dx.doi.org/10.1111/j.1468-0343.2007.00312.x.

Myoung-Jae Lee. *Micro-Econometrics for Policy, Program and Treatment Effects*. Oxford University Press, Oxford, April 2005. ISBN 9780199267699. URL http://dx.doi.org/10.1093/0199267693.001.0001.

R. G. Lipsey. The theory of customs unions: A general survey. *The Economic Journal*, 70(279):496–513, 1960. ISSN 0013-0133. doi: 10.2307/2228805. URL http://www.jstor.org/stable/2228805.

R. G. Lipsey and Kelvin Lancaster. The general theory of second best. *The Review of Economic Studies*, 24(1):11–32, January 1956. ISSN 0034-6527. doi: 10.2307/2296233. URL http://www.jstor.org/stable/2296233.

John McMillan and Ewen McCann. Welfare effects in customs unions. *The Economic Journal*, 91(363):697–703, 1981. ISSN 0013-0133. doi: 10.2307/2232833. URL http://www.jstor.org/stable/2232833.

J. E. Meade. *The theory of customs unions*. North-Holland, Amsterdam, 1955.

Marc J. Melitz. The impact of trade on Intra-Industry reallocations and aggregate industry productivity. *Econometrica*, 71(6):1695–1725, 2003. URL http://ideas.repec.org/a/ecm/emetrp/v71y2003i6p1695-1725.html.

A. H. Q. M. Merkies and T. van der Meer. A theoretical foundation for constant market share analysis. *Empirical Economics*, 13(2):65–80, 1988. ISSN 0377-7332. doi: 10.1007/BF01973315. URL http://www.springerlink.com/content/k22433v017774082/abstract/.

Tommaso Nannicini. Simulation-based sensitivity analysis for matching estimators. *Stata Journal*, 7(3):334–350, 2007. URL http://ideas.repec.org/a/tsj/stataj/v7y2007i3p334-350.html.

Rich Nielsen and John Sheffield. Matching with time-series cross-sectional data. 2009. Working Paper, Accessed July 11, 2011.

Kofi Nouve. Estimating the effects of AGOA on African exports using a dynamic panel analysis. 2005. URL http://ssrn.com/abstract=1026204.

Kofi Nouve and John Staatz. The African growth and opportunity act and the latent agricultural export response in sub-saharan Africa. 2003. Paper prepared for the 2003 Annual Meeting of the American Agricultural Economics Association, Montreal, Quebec, Canada, July 27-30.

A. Panagariya. Preferential trading and the myth of natural trading partners. *Japan and the World Economy*, 9(4):471–489, December 1997. ISSN 0922-1425. doi: 10.1016/S0922-1425(97)00020-0. URL http://www.sciencedirect.com/science/article/pii/S0922142597000200.

Arvind Panagariya. Preferential trade liberalization: The traditional theory and new developments. *Journal of Economic Literature*, 38(2):287–331, June 2000. ISSN 0022-0515. URL http://www.jstor.org/stable/2565291.

Arvind Panagariya and Pravin Krishna. On necessarily welfare-enhancing free trade areas. *Journal of International Economics*, 57(2):353–367, August 2002. ISSN 0022-1996. doi: 10.1016/S0022-1996(01)00152-0. URL http://www.sciencedirect.com/science/article/pii/S0022199601001520.

David J. Richardson. Constant-market-shares analysis of export growth. *Journal of International Economics*, 1(2):227–239, May 1971a. ISSN 0022-1996. doi:

10.1016/0022-1996(71)90058-4. URL http://www.sciencedirect.com/science/article/pii/0022199671900584.

J. David Richardson. Some sensitivity tests for a "Constant-Market-Shares" analysis of export growth. *The Review of Economics and Statistics*, 53(3):300–304, 1971b. ISSN 0034-6535. doi: 10.2307/1937978. URL http://www.jstor.org/stable/1937978.

P. R. Rosenbaum and D. B. Rubin. Assessing sensitivity to an unobserved binary covariate in an observational study with binary outcome. *Journal of the Royal Statistical Society. Series B (Methodological)*, 45(2):212–218, January 1983a. ISSN 0035-9246. URL http://www.jstor.org/stable/2345524. ArticleType: research-article / Full publication date: 1983 / Copyright 1983 Royal Statistical Society.

Paul R. Rosenbaum. Sensitivity analysis for certain permutation inferences in matched observational studies. *Biometrika*, 74(1):13–26, March 1987. ISSN 0006-3444. doi: 10.2307/2336017. URL http://www.jstor.org/stable/2336017.

Paul R Rosenbaum. Discussing hidden bias in observational studies. *Annals of Internal Medicine*, 115(11):901–905, December 1991a. ISSN 0003-4819, 1539-3704. doi: 10.1059/0003-4819-115-11-901. URL http://www.annals.org/content/115/11/901.

Paul R. Rosenbaum. Sensitivity analysis for matched Case-Control studies. *Biometrics*, 47(1):87–100, March 1991b. ISSN 0006-341X. doi: 10.2307/2532498. URL http://www.jstor.org/stable/2532498. Accessed March 2, 2012.

Paul R. Rosenbaum. Covariance adjustment in randomized experiments and observational studies. *Statistical Science*, 17(3):286–304, 2002. ISSN 0883-4237. URL http://www.jstor.org/stable/3182790.

Paul R. Rosenbaum. Design sensitivity in observational studies. *Biometrika*, 91(1):153–164, March 2004. ISSN 0006-3444. URL http://www.jstor.org/stable/20441085.

Paul R. Rosenbaum. Design sensitivity and efficiency in observational studies. *Journal of the American Statistical Association*, 105(490):692–702, June 2010. ISSN 0162-1459, 1537-274X. doi: 10.1198/jasa.2010.tm09570. URL http://amstat.tandfonline.com/doi/abs/10.1198/jasa.2010.tm09570.

Paul R Rosenbaum. An exact adaptive test with superior design sensitivity in an observational study of treatments for ovarian cancer. *arXiv:1203.3672*, March 2012. doi: 10.1214/11-AOAS508. URL http://arxiv.org/abs/1203.3672. Annals of Applied Statistics 2012, Vol. 6, No. 1, 83-105.

Paul R. Rosenbaum and Donald B. Rubin. The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70(1):41–55, April 1983b. doi: 10.2307/2335942. URL http://www.jstor.org/stable/2335942.

Paul R. Rosenbaum and Donald B. Rubin. Constructing a control group using multivariate matched sampling methods that incorporate the propensity score. *The American Statistician*, 39(1):33–38, February 1985. doi: 10.2307/2683903. URL http://www.jstor.org/stable/2683903.

Belay Seyoum. Export performance of developing countries under the africa growth and opportunity act experience from us trade with sub-saharan africa. *Journal of Economic Studies*, 34(6):515 – 533, 2007. URL DOI:10.1108/01443580710830970.

Bedassa Tadesse and Bichaka Fayissa. The impact of african growth and opportunity act (AGOA) on U.S. imports from Sub-Saharan africa (SSA). *Journal of International Development*, 20(7):920–941, 2008.

Bedassa Tadesse, Bichaka Fayissa, and Andrew McColley. Does a unilateral policy change promote trade? the case of african growth and opportunity act. 2008. Working paper.

H. Tyszynksi. World trade in manufactured commodities, 1899–1950. *The Manchester School, XIX*, (3):272–304, September 1951. URL http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9957.1951.tb00012.x/abstract.

USITC. Sub-saharan africa: Factors affecting trade patterns of selected industries first annual report. Technical report, US International Trade Commission, 2007. URL www.usitc.gov. Accessed July 14, 2009.

J. Viner. *The customs union issue*. Carnegie Endowment for International Peace, New York, 1950.

Mahmut Yasar and Roderick M. Rejesus. Exporting status and firm performance: Evidence from a matched sample. *Economics Letters*, 88(3):397–402, September 2005. doi: 10.1016/j.econlet.2005.05.001. URL http://www.sciencedirect.com/science/article/B6V84-4GGWG5Y-2/2/f6663013aaf4ab694ac29c7c900f2d65.

A Appendix

Table 20: Summary Statistics

	count	mean	min	max
year	1650	2005.500	2001	2010
Mirror Exports Share-ROW	1536	0.529	0.000725	0.998
Mirror Exports Share-EU 25	1572	0.303	0.000131	0.999
Mirror Exports Share-USA	1539	0.169	0.000000809	0.959
Mirror Exports Share-USA/EU	1580	0.466	0	0.999
Mirror Exports to EU	1572	2.72e+09	1000	5.28e+10
Mirror Exports to USA	1539	2.33e+09	1327	5.69e+10
Mirror Exports to ROW	1536	8.29e+09	1568	2.22e+11
No program claimed	1650	1.95e+09	0	5.48e+10
GSP Imports	1280	1.56e+08	0	6.26e+09
Non GSP Imports	1650	2.55e+08	0	1.76e+10
Non-GSP/TT Imports	1606	0.115	0	0.988
GSP/TT Imports	1278	0.074	0	1
No prog/TT Imports	1606	0.826	0	1
Share of exports of product 1 to eu	1577	0.063	0	0.840
Share of exports of product 1 to usa	1577	0.021	0	0.650
Share of exports of product 2 to eu	1579	0.043	0	0.678
Share of exports of product 2 to usa	1579	0.011	0	0.432
Share of exports of product 3 to eu	1571	0.054	0	0.847
Share of exports of product 3 to usa	1571	0.051	0	0.906
Share of exports of product 4 to eu	1580	0.018	0	0.812
Share of exports of product 4 to usa	1580	0.007	0	0.234
Share of exports of product 5 to eu	1580	0.039	0	0.692
Share of exports of product 5 to usa	1580	0.050	0	0.958
Share of exports of product 6 to eu	1578	0.021	0	0.670
Share of exports of product 6 to usa	1578	0.006	0	0.132
Share of exports of product 7 to eu	1580	0.054	0	0.959
Share of exports of product 7 to usa	1580	0.015	0	0.727
Share of exports of product 8 to eu	1578	0.008	0	0.373
Share of exports of product 8 to usa	1578	0.004	0	0.175
Area	1570	4.08e+05	10	8.51e+06
Real GDP	1278	5757.740	145	42188.809
Weighted distance	1570	9845.144	2387.8	16764.666
Landlocked	1580	0.139	0	1
Voice & Accountability	1370	42.241	0	97
Political Stability	1290	41.012	1.5	96
Government Effectiveness	1330	42.466	1.5	98
Regulatory Quality	1340	42.306	0	100
Rule of Law	1340	40.646	0	92
Corruption	1330	43.342	0	96.5
Adj. Saving per GNI	975	8.765	-167.5	89.299
GDP per capita	1256	3026.931	62.95	27169.707
AGOA Treatment	1650	0.212	0	1
High Income (NonOECD) (HI)	1400	0.157	0	1
Low Income (LI)	1400	0.236	0	1
Lower Middle Income (LMI)	1400	0.343	0	1
Upper Middle Income (UMI)	1400	0.264	0	1
Majority Christian	1282	0.495	0	1
Majority Muslim	1282	0.303	0	1
Other Religion	1282	0.203	0	1
Observations	1650			

These are based on all developing countries and not the matched sample. Export share and preferential import data is for 2001-2010 Data for controls based on data from 1985-1999 in most cases Data from WGI are based on averages for 1996 & 1998. 1–Agriculture, meat and dairy, seafood; 2–Food, beverages, tobacco, wood, paper; 3–Extractive industries; 4–Chemicals, plastics, rubber; 5–Textiles, apparel, leather, footwear; 6–Iron, steel, and other metals; 7–Machinery, electronics, transportation equipment; 8–Other industries. 1 if (Landlocked, AGOA treatment, HI, LI, LMI, UMI, Majority Christian, Majority Muslim, Other Religion) and 0 otherwise.

Table 21: SSA countries belonging to the *agoa* preference

Angola	Djibouti	Madagascar	Rwanda
Botswana	Ethiopia (excludes Eritrea)	Malawi	Senegal
Burkina Faso	Gabon	Mali	Sierra Leone
Cameroon	Gambia, The	Mauritania	South Africa
Cape Verde	Ghana	Mauritius	Swaziland
Chad	Guinea	Mozambique	Tanzania
Congo, DR	Guinea Bissau	Namibia	Uganda
Congo, Rep.	Kenya	Niger	Zambia
Cote d'Ivoire	Lesotho	Nigeria	

Table 22: CBTPA countries including prior CAFTA-DR members

Barbados	El Salvador	Honduras	St. Lucia
Belize	Guatemala	Jamaica	Trinidad and Tobago
Costa Rica	Guyana	Nicaragua	
Dominican Republic	Haiti	Panama	

Table 23: Other countries in the data

Afghanistan	Chile	Libya	Solomon Is.
Algeria	Comoro Is.	Malaysia	Somalia
Argentina	Eritrea	Maldives	Sri Lanka
Bangladesh	India	Mongolia	Thailand
Benin	Iran, Islamic Rep.	Nepal	Togo
Bhutan	Jordan	P. N. Guinea	Tunisia
Brazil	Kiribati	Pakistan	Uruguay
Burundi	Laos	Peru	Vietnam
Cambodia	Lebanon	Philippines	Yemen
Cent. African Rep.	Liberia	Sao Tome & Principe	Zimbabwe

Table 24: Choice of Caliper Size

	Ratio of S.Es	Pooled Standard error	Caliper Size
Model 1	.749	.256	.019
Model 2	.901	.29	.026
Model 3	.909	.29	.026
Model 4	.989	.304	.03

These are the suggested caliper sizes. However, we varied the caliper sizes used in estimation of the radius matching estimates. (Match/Unmatched)

Table 25: Robustness Check for Apparel & Textile Exports

Variable	N [NT (NC)]	Kernel (bw=0.06)	Radius ($\delta = 0.05$)	stratification
Non Apparel & Textiles (Share of Country Total)				
EU	75 [35 (40)]	.125 (.064) [1.953]	.1281 (.0634) [2.021]	.1198 (.0655) [1.828]
USA	75 [35 (40)]	.0628 (.0277) [2.264]	.0631 (.0281) [2.241]	.0581 (.0247) [2.354]
ROW	75 [35 (40)]	-.1209 (.0708) [-1.709]	-.1251 (.0711) [-1.758]	-.1271 (.0734) [-1.73]
Apparel & Textiles (Share of Country Total)				
EU	75 [35 (40)]	-.0348 (.027) [-1.288]	-.0345 (.0266) [-1.297]	-.0313 (.0286) [-1.097]
USA	75 [35 (40)]	-.029 (.0358) [-.812]	-.0285 (.0358) [-.797]	-.02 (.036) [-.555]
ROW	75 [35 (40)]	-.003 (.0278) [-.109]	-.003 (.0283) [-.108]	.0005 (.023) [.021]
Non Apparel & Textiles (Levels)				
EU	75 [35 (40)]	-912528783.19 (1227247429.52) [-.744]	-841872846.39 (1235421439.14) [-.681]	-1388483968 (1403621411.47) [-.989]
USA	75 [35 (40)]	-48301812.94 (983971115.76) [-.049]	-60845079.2 (1018867419.22) [-.06]	-450142016 (1036198816.75) [-.434]
ROW	75 [35 (40)]	-4446158517.38 (2925977306.06) [-1.52]	-4331458320.88 (3152273661.84) [-1.374]	-6219127296 (3806057487.43) [-1.634]
Apparel & Textiles (Levels)				
EU	75 [35 (40)]	-568735170.06 (294787679.43) [-1.929]	-513666038.52 (274122141.63) [-1.874]	-800730752 (525236582.1) [-1.525]
USA	75 [35 (40)]	-544541826.59 (239013941.78) [-2.278]	-494264942.08 (224575999.92) [-2.201]	-706640384 (345582105.53) [-2.045]
ROW	75 [35 (40)]	-367879430.67 (163175528.92) [-2.255]	-322483658.54 (142434581.89) [-2.264]	-571342208 (367837643.83) [-1.553]

Bootstrapped Standard errors with 250 replications reported in parenthesis. Z-statistics reported for Kernel and Radius matching and T-statistics reported for Stratification matching are reported in square brackets. Critical values are $Z(\alpha = 0.1) = 1.64$; $Z(\alpha = 0.05) = 1.96$; $t_{75,0.1} = 1.293$; and $t_{75,0.05} = 1.666$. Apparel & Textile products in the table are based on HS 50–63. All other products HS 01–49 & HS 64–97 are included in the Non Apparel & Textile group. Outcome variables are based on mirror exports to the EU, USA and ROW for each country i. Results are based on the propensity score calculated in Model 1

Table 26: Rosenbaum's Bounds Analysis for Model 1 *ATT* estimates with $\delta = 0.05$

Outcome	Gamma (Γ)	Sign Rank (+)	Sign Rank (-)	prob value (+)	prob value (-)
Model 1: Caliper=0.05					
No programme	1	-3.0465205	-3.0465205	.99884248	.99884248
No programme	1.4	-3.9618387	-2.217633	.99996281	.98671007
No programme	1.5	-4.1625061	-2.0561779	.99998426	.98011732
No programme	1.6	-4.3546987	-1.9073656	.99999332	.97176337
GSP Preference	1	-1.8999805	-1.8999805	.97128218	.97128218
GSP Preference	1.4	-2.7990348	-1.0548291	.99743724	.85424829
GSP Preference	1.5	-2.9923239	-.88599533	.99861568	.81219
GSP Preference	1.6	-3.1763532	-.72902024	.99925429	.76700538
Non–GSP Preference	1	1.4413645	1.4413645	.07474086	.07474086
Non–GSP Preference	1.4	.58970761	2.3339133	.27769333	.00980013
Non–GSP Preference	1.5	.41792232	2.5242507	.33800197	.00579726
Non–GSP Preference	1.6	.25768188	2.7050145	.39832622	.00341507
Non–GSP Share	1	4.4387474	4.4387474	4.524e-06	4.524e-06
Non–GSP Share	1.4	3.6296091	5.3738146	.00014193	3.854e-08
Non–GSP Share	1.5	3.4771137	5.5834422	.00025342	1.179e-08
Non–GSP Share	1.6	3.3382132	5.7855458	.0004216	3.614e-09
Non–GSP Share	2	2.8838689	6.5321369	.00196411	3.242e-11
Non–GSP Share	3	2.1466262	8.1042233	.01591153	2.220e-16
Non–GSP Share	**4**	**1.6788622**	**9.4180069**	**.04658945**	**0**
Non–GSP Share	5	1.3404704	10.56994	.09004623	0
GSP Share	1	-.54051173	-.54051173	.70557791	.70557791
GSP Share	1.4	-1.4202818	.32392392	.92223716	.37299782
GSP Share	1.5	-1.6048217	.50150681	.94573349	.30800724
GSP Share	1.6	-1.7791722	.66816062	.96239424	.25201553
No Programme Share	1	-4.0947857	-4.0947857	.9999789	.9999789
No Programme Share	1.4	-5.0249734	-3.2807679	.99999976	.99948239
No Programme Share	1.5	-5.2323875	-3.1260591	.99999994	.99911416
No Programme Share	1.6	-5.4320431	-2.9847097	1	.99858075
USA Imports, USITC	1	-2.3422174	-2.3422174	.99041522	.99041522
USA Imports, USITC	1.4	-3.247545	-1.5033392	.99941796	.93362421
USA Imports, USITC	1.5	-3.44368	-1.3373514	.99971306	.909446
USA Imports, USITC	1.6	-3.6308577	-1.1835248	.99985874	.88169938
Mirror Exports, EU	1	-2.1129093	-2.1129093	.98269576	.98269576
Mirror Exports, EU	1.4	-3.0149841	-1.2707784	.99871504	.89809626
Mirror Exports, EU	1.5	-3.2096434	-1.1033149	.99933553	.86505479
Mirror Exports, EU	1.6	-3.3951888	-.94785577	.99965709	.82839859
Mirror Exports, USA	1	-2.3913548	-2.3913548	.99160683	.99160683
Mirror Exports, USA	1.4	-3.2973793	-1.5531737	.99951202	.9398092
Mirror Exports, USA	1.5	-3.4938307	-1.3875021	.99976194	.91735566
Mirror Exports, USA	1.6	-3.6813583	-1.2340254	.99988401	.89140326
Mirror Exports, ROW	1	-3.0137622	-3.0137622	.99870986	.99870986
Mirror Exports, ROW	1.4	-3.9286158	-2.1844101	.99995726	.98553395
Mirror Exports, ROW	1.5	-4.1290727	-2.0227439	.99998176	.97845024
Mirror Exports, ROW	1.6	-4.3210316	-1.8736985	.99999225	.96951401
No Programme (2002 − 1997)	1	-4.7499514	-4.7499514	.99999899	.99999899
No Programme (2002 − 1997)	1.4	-5.6894331	-3.9452271	1	.99996012
No Programme (2002 − 1997)	1.5	-5.901063	-3.7947347	1	.99992609
No Programme (2002 − 1997)	1.6	-6.1053829	-3.6580498	1	.99987292
USA, USITC: (2002 − 1997)	1	-4.3404727	-4.3404727	.99999291	.99999291
USA, USITC: (2002 − 1997)	1.4	-5.2741456	-3.5299401	.99999994	.99979216
USA, USITC: (2002 − 1997)	1.5	-5.4831409	-3.3768125	1	.99963337
USA, USITC: (2002 − 1997)	1.6	-5.6845455	-3.2372124	1	.9993965
Non–GSP Preference (2002 − 1997)	1	2.9169061	2.9169061	.00176761	.00176761
Non–GSP Preference (2002 − 1997)	1.4	2.0940652	3.8225002	.01812709	.00006605
Non–GSP Preference (2002 − 1997)	1.5	1.9334128	4.0206966	.02659268	.00002901
Non–GSP Preference (2002 − 1997)	**1.6**	**1.7852198**	**4.2104239**	**.03711284**	**.00001274**
Non–GSP Preference (2002 − 1997)	2	1.2862056	4.9014864	.09918565	4.756e-07
Non–GSP Preference (2002 − 1997)	3	.41628858	6.3200178	.33859941	1.308e-10
GSP Imports (2002 − 1997)	1	-1.9901326	-1.9901326	.97671181	.97671181
GSP Imports (2002 − 1997)	1.4	-2.8891103	-1.1476147	.99806833	.8744362
GSP Imports (2002 − 1997)	1.5	-3.0826988	-.97964281	.99897432	.83636874
GSP Imports (2002 − 1997)	1.6	-3.2671046	-.82357454	.9994567	.7949093
Mirror Exports, EU (2002 − 1997)	1	-3.3902023	-3.3902023	.99965078	.99965078
Mirror Exports, EU (2002 − 1997)	1.4	-4.2597728	-2.6168122	.99998975	.99556226
Mirror Exports, EU (2002 − 1997)	1.5	-4.4521427	-2.4680791	.99999577	.99320799
Mirror Exports, EU (2002 − 1997)	1.6	-4.6368842	-2.3316109	.99999821	.99013942
Mirror Exports, USA (2002 − 1997)	1	-4.2267938	-4.2267938	.99998814	.99998814
Mirror Exports, USA (2002 − 1997)	1.4	-5.0950804	-3.4784224	.99999982	.99974781
Mirror Exports, USA (2002 − 1997)	1.5	-5.2901034	-3.3378034	.99999994	.99957776
Mirror Exports, USA (2002 − 1997)	1.6	-5.4782305	-3.2098622	1	.999336
Mirror Exports, ROW (2002 − 1997)	1	-2.6841683	-2.6841683	.99636447	.99636447
Mirror Exports, ROW (2002 − 1997)	1.4	-3.5305727	-1.9139146	.9997927	.97218448
Mirror Exports, ROW (2002 − 1997)	1.5	-3.715668	-1.7633678	.99989867	.96108073
Mirror Exports, ROW (2002 − 1997)	1.6	-3.892812	-1.624444	.99995047	.94785947
Share of Mirror Exports, ROW (2002 − 1997)	1	-1.3677945	-1.3677945	.91431183	.91431183
Share of Mirror Exports, ROW (2002 − 1997)	1.4	-2.1955259	-.57886785	.98593706	.71866083
Share of Mirror Exports, ROW (2002 − 1997)	1.5	-2.3721495	-.41984949	.99115753	.66270232
Share of Mirror Exports, ROW (2002 − 1997)	1.6	-2.5399218	-.27155384	.99445611	.60701746
Share of Mirror Exports, EU (2002 − 1997)	**1**	**2.2731993**	**2.2731993**	**.01150709**	**.01150709**
Share of Mirror Exports, EU (2002 − 1997)	1.4	1.4839649	3.1269252	.06890912	.00088322
Share of Mirror Exports, EU (2002 − 1997)	1.5	1.3280424	3.3121057	.09208205	.00046298
Share of Mirror Exports, EU (2002 − 1997)	1.6	1.1836215	3.4888949	.11828146	.00024251
Share of Mirror Exports, USA (2002 − 1997)	1	-2.1082547	-2.1082547	.98249555	.98249555
Share of Mirror Exports, USA (2002 − 1997)	1.4	-2.9464896	-1.3298316	.998393	.90821314
Share of Mirror Exports, USA (2002 − 1997)	1.5	-3.1278787	-1.1755786	.99911964	.88011837
Share of Mirror Exports, USA (2002 − 1997)	1.6	-3.3009226	-1.0325546	.99951816	.84909379
Share of Mirror Exports, USA (2010 − 1999)	1	2.6651301	2.6651301	.00384793	.00384793
Share of Mirror Exports, USA (2010 − 1999)	1.4	1.8814553	3.5244157	.02995501	.00021221
Share of Mirror Exports, USA (2010 − 1999)	**1.5**	**1.7280552**	**3.7121184**	**.04198916**	**.00010277**
Share of Mirror Exports, USA (2010 − 1999)	1.6	1.5864247	3.8916981	.0563215	.00004977

Share of Mirror Exports, USA (2010 − 1999)	2	1.1085476	4.5450463	.13381271	2.746e-06
Share of Mirror Exports, EU (2010 − 1999)	1	-1.2149857	-1.2149857	.88781422	.88781422
Share of Mirror Exports, EU (2010 − 1999)	1.4	-2.0537004	-.41073996	.97999763	.6593684
Share of Mirror Exports, EU (2010 − 1999)	1.5	-2.2320716	-.24800812	.9871949	.59793591
Share of Mirror Exports, EU (2010 − 1999)	1.6	-2.4013267	-.09605327	.99183214	.53826088
Share of Mirror Exports, ROW (2010 − 1999)	1	.11757927	.11757927	.45320052	.45320052
Share of Mirror Exports, ROW (2010 − 1999)	1.4	-.70223278	.94072765	.75873297	.17342222
Share of Mirror Exports, ROW (2010 − 1999)	1.5	-.87202805	1.1120354	.80840349	.13306147
Share of Mirror Exports, ROW (2010 − 1999)	1.6	-1.0317959	1.2734776	.84891611	.10142431
Mirror Exports, ROW (2010 − 1999)	1	-2.5083578	-2.5083578	.99393529	.99393529
Mirror Exports, ROW (2010 − 1999)	1.4	-3.3654189	-1.7224586	.99961787	.95750678
Mirror Exports, ROW (2010 − 1999)	1.5	-3.552114	-1.5680503	.99980891	.94156528
Mirror Exports, ROW (2010 − 1999)	1.6	-3.7305772	-1.4253037	.99990445	.92296529
Mirror Exports, USA (2010 − 1999)	1	-1.8616718	-1.8616718	.96867532	.96867532
Mirror Exports, USA (2010 − 1999)	1.4	-2.7095597	-1.0665992	.99663138	.85692358
Mirror Exports, USA (2010 − 1999)	1.5	-2.8920927	-.9080292	.99808657	.81806862
Mirror Exports, USA (2010 − 1999)	1.6	-3.0659518	-.76067853	.99891514	.77657545
Mirror Exports, EU (2010 − 1999)	1	-2.449568	-2.449568	.99284863	.99284863
Mirror Exports, EU (2010 − 1999)	1.4	-3.3057954	-1.662835	.99952644	.95182729
Mirror Exports, EU (2010 − 1999)	1.5	-3.4921119	-1.5080484	.99976039	.93422896
Mirror Exports, EU (2010 − 1999)	1.6	-3.6701567	-1.3648833	.99987882	.91385514
GSP Imports (2010 − 1999)	1	-.36034113	-.36034113	.64070398	.64070398
GSP Imports (2010 − 1999)	1.4	-1.2375555	.50665021	.89205956	.30620015
GSP Imports (2010 − 1999)	1.5	-1.4209359	.68539262	.92233229	.2465481
GSP Imports (2010 − 1999)	1.6	-1.5940037	.85332912	.94453239	.19673841
Non–GSP Imports (2010 − 1999)	1	.5569002	.5569002	.2887978	.2887978
Non–GSP Imports (2010 − 1999)	1.4	-.30731758	1.4369174	.62069917	.07537073
Non–GSP Imports (2010 − 1999)	1.5	-.48479801	1.6215658	.68609017	.05244817
Non–GSP Imports (2010 − 1999)	1.6	-.65133828	1.7960355	.74258596	.03624443
USA Imports, USITC (2010 − 1999)	1	-2.2603216	-2.2603216	.98809934	.98809934
USA Imports, USITC (2010 − 1999)	1.4	-3.1644874	-1.4202818	.99922323	.92223716
USA Imports, USITC (2010 − 1999)	1.5	-3.3600955	-1.253767	.99961042	.89503664
USA Imports, USITC (2010 − 1999)	1.6	-3.5466902	-1.0993574	.99980497	.86419392
No Programme (2010 − 1999)	1	-2.637042	-2.637042	.99581838	.99581838
No Programme (2010 − 1999)	1.4	-3.5465517	-1.8023459	.99980485	.9642545
No Programme (2010 − 1999)	1.5	-3.7445841	-1.6382555	.99990964	.94931579
No Programme (2010 − 1999)	1.6	-3.9338608	-1.4865279	.99995822	.93143022

The calculations in the table are based on Rosenbaum (1987, 1991a,b) The log odds of being in the treatment group is given by the logit model $\log[Pr(T=1|X=x,U=u)/Pr(T=0|X=x,U=x)] = \kappa_x + \gamma u$, where $\gamma = \log(\Gamma)$, for each x, κ_x is an unknown parameter, u is the unobserved variable.

Table 27: Rosenbaum's Bounds Analysis for Model 1 *ATT* estimates with $\delta = 0.01$

Outcome	Gamma (γ)	Sign Rank (+)	Sign Rank (-)	prob value (+)	prob value (-)
Model 1: Caliper=0.01					
No programme	1	-1.9142857	-1.9142857	.97220814	.97220814
No programme	1.4	-2.665858	-1.2170222	.99616039	.88820213
No programme	1.5	-2.8285773	-1.0789418	.99766225	.85969317
No programme	1.6	-2.983835	-.95094222	.9985767	.82918316
GSP Preference	1	-1.3797901	-1.3797901	.91617435	.91617435
GSP Preference	1.4	-2.0935562	-.7051689	.98185021	.75964743
GSP Preference	1.5	-2.2465611	-.56992418	.98766595	.71563542
GSP Preference	1.6	-2.3921037	-.4440279	.99162394	.67148882
Non–GSP Preference	1	3.1714287	3.1714287	.00075846	.00075846
Non–GSP Preference	1.4	2.4919977	3.9408338	.00635134	.0000406
Non–GSP Preference	1.5	2.3620079	4.1116433	.00908813	.00001964
Non–GSP Preference	1.6	2.2429583	4.2758508	.01244975	9.520e-06
Non–GSP Preference	**2**	**1.8485793**	**4.8790364**	**.03225929**	**5.330e-07**
Non–GSP Preference	3	1.187692	6.1364088	.11747738	4.220e-10
Non–GSP Share	1	3.8857143	3.8857143	.00005101	.00005101
Non–GSP Share	1.4	3.2164159	4.6652517	.00064901	1.541e-06
Non–GSP Share	1.5	3.0910227	4.8406582	.00099734	6.470e-07
Non–GSP Share	1.6	2.9770584	5.0099511	.00145514	2.722e-07
Non–GSP Share	2	2.6061938	5.636651	.00457773	8.669e-09
Non–GSP Share	3	2.0124781	6.961195	.02208478	1.687e-12
Non–GSP Share	**4**	**1.6428573**	**8.0714283**	**.05020623**	**3.331e-16**
Non–GSP Share	5	1.3799733	9.0464926	.08379743	0
GSP Share	1	.73047709	.73047709	.23254931	.23254931
GSP Share	1.4	.04664559	1.4350327	.48139784	.07563888
GSP Share	1.5	-.09277843	1.5838584	.53696018	.05661298
GSP Share	1.6	-.22329721	1.7247787	.58834791	.04228368
No Programme Share	1	-3.8285713	-3.8285713	.99993557	.99993557
No Programme Share	1.4	-4.6072984	-3.1584623	.99999797	.99920696
No Programme Share	1.5	-4.7823367	-3.0327015	.99999911	.99878812
No Programme Share	1.6	-4.9512234	-2.9183307	.99999964	.99824047
USA Imports, USITC	1	-1.3714286	-1.3714286	.91487932	.91487932
USA Imports, USITC	1.4	-2.1153004	-.66646451	.9827978	.7474429
USA Imports, USITC	1.5	-2.2745261	-.52489066	.98853284	.7001704
USA Imports, USITC	1.6	-2.4259188	-.39302608	.99236518	.65284991
Mirror Exports, EU	1	-1.0285715	-1.0285715	.84815943	.84815943
Mirror Exports, EU	1.4	-1.7675798	-.31874391	.96143442	.62503964
Mirror Exports, EU	1.5	-1.9245989	-.17496355	.97286022	.56944585
Mirror Exports, EU	1.6	-2.0735507	-.04065801	.98093945	.51621574
Mirror Exports, USA	1	-1.2	-1.2	.88493031	.88493031
Mirror Exports, USA	1.4	-1.9414401	-.49260423	.97389752	.68885386
Mirror Exports, USA	1.5	-2.0995626	-.3499271	.98211634	.63680327
Mirror Exports, USA	1.6	-2.2497346	-.21684206	.9877671	.58583426
Mirror Exports, ROW	1	-2.4857142	-2.4857142	.9935354	.9935354
Mirror Exports, ROW	1.4	-3.2453926	-1.7965566	.99941355	.96379697
Mirror Exports, ROW	1.5	-3.4117892	-1.6621537	.9996773	.95175904
Mirror Exports, ROW	1.6	-3.571115	-1.5382223	.99982226	.93800288
No Programme (2002 − 1997)	1	-3.6857142	-3.6857142	.99988598	.99988598
No Programme (2002 − 1997)	1.4	-4.4624147	-3.0135787	.99999595	.99870908
No Programme (2002 − 1997)	1.5	-4.6365337	-2.8868985	.99999821	.99805468
No Programme (2002 − 1997)	1.6	-4.8044033	-2.7715106	.99999923	.99721014
USA, USITC: (2002 − 1997)	1	-3.5999999	-3.5999999	.99984092	.99984092
USA, USITC: (2002 − 1997)	1.4	-4.3754845	-2.9266486	.99999392	.99828684
USA, USITC: (2002 − 1997)	1.5	-4.5490522	-2.7994168	.99999732	.99744028
USA, USITC: (2002 − 1997)	1.6	-4.7163115	-2.6834185	.99999881	.99635631
Non–GSP Preference (2002 − 1997)	**1**	**2.0887003**	**2.0887003**	**.01836736**	**.01836736**
Non–GSP Preference (2002 − 1997)	1.4	1.4073828	2.8292747	.07965695	.00233268
Non–GSP Preference (2002 − 1997)	1.5	1.2732217	2.9903197	.10146969	.00139343
Non–GSP Preference (2002 − 1997)	1.6	1.1490977	3.1441848	.12525785	.00083275
GSP Imports (2002 − 1997)	1	-.77927828	-.77927828	.78209209	.78209209
GSP Imports (2002 − 1997)	1.4	-1.4818733	-.09879155	.93081301	.53934813
GSP Imports (2002 − 1997)	1.5	-1.6304629	.03976728	.94849813	.48413932
GSP Imports (2002 − 1997)	1.6	-1.771212	.16942012	.96173728	.43273309
Mirror Exports, EU (2002 − 1997)	1	-.47075191	-.47075191	.68109107	.68109107
Mirror Exports, EU (2002 − 1997)	1.4	-1.171623	.21676409	.87932575	.4141961
Mirror Exports, EU (2002 − 1997)	1.5	-1.3187777	.3578591	.90637827	.36022437
Mirror Exports, EU (2002 − 1997)	1.6	-1.4578487	.49022725	.9275589	.31198654
Mirror Exports, USA (2002 − 1997)	1	-3.2303321	-3.2303321	.99938178	.99938178
Mirror Exports, USA (2002 − 1997)	1.4	-3.9703484	-2.5819612	.99996412	.99508798
Mirror Exports, USA (2002 − 1997)	1.5	-4.1352625	-2.4586258	.9999823	.99302649
Mirror Exports, USA (2002 − 1997)	1.6	-4.2939801	-2.3459044	.99999124	.99050951
Mirror Exports, ROW (2002 − 1997)	1	-2.3537595	-2.3537595	.9907077	.9907077
Mirror Exports, ROW (2002 − 1997)	1.4	-3.0813415	-1.6929543	.99896967	.95476794
Mirror Exports, ROW (2002 − 1997)	1.5	-3.2406144	-1.5639776	.99940366	.94108856
Mirror Exports, ROW (2002 − 1997)	1.6	-3.3930914	-1.4450155	.99965447	.92577326
Share of Mirror Exports, ROW (2002 − 1997)	1	-1.4122558	-1.4122558	.92106265	.92106265
Share of Mirror Exports, ROW (2002 − 1997)	1.4	-2.1264822	-.7380951	.98326844	.7697717
Share of Mirror Exports, ROW (2002 − 1997)	1.5	-2.2796962	-.60305929	.98868716	.72676539
Share of Mirror Exports, ROW (2002 − 1997)	1.6	-2.4254701	-.47739413	.9923557	.68345928
Share of Mirror Exports, EU (2002 − 1997)	1	1.8992405	1.8992405	.02876643	.02876643
Share of Mirror Exports, EU (2002 − 1997)	1.4	1.2319881	2.6203752	.10897677	.00439165
Share of Mirror Exports, EU (2002 − 1997)	1.5	1.1000857	2.7767227	.13564739	.0027455
Share of Mirror Exports, EU (2002 − 1997)	1.6	.97788799	2.9259639	.16406487	.00171695
Share of Mirror Exports, USA (2002 − 1997)	1	-.99020231	-.99020231	.83896238	.83896238
Share of Mirror Exports, USA (2002 − 1997)	1.4	-1.6984419	-.31005478	.95528781	.62174034
Share of Mirror Exports, USA (2002 − 1997)	1.5	-1.8489395	-.17230275	.9677667	.56840026
Share of Mirror Exports, USA (2002 − 1997)	1.6	-1.9917088	-.04363284	.97679847	.51740146
Share of Mirror Exports, USA (2010 − 1999)	1	1.2174618	1.2174618	.11171427	.11171427
Share of Mirror Exports, USA (2010 − 1999)	1.4	.54053825	1.9289254	.29441294	.02687006
Share of Mirror Exports, USA (2010 − 1999)	1.5	.40424833	2.0808852	.34301504	.01872221
Share of Mirror Exports, USA (2010 − 1999)	1.6	.27719662	2.2252724	.39081457	.01303148
Share of Mirror Exports, EU (2010 − 1999)	1	-1.1849962	-1.1849962	.88199055	.88199055

Share of Mirror Exports, EU (2010 − 1999)	1.4	-1.895999	-.50761187	.97101992	.69413722
Share of Mirror Exports, EU (2010 − 1999)	1.5	-2.0477502	-.37111345	.97970778	.64472347
Share of Mirror Exports, EU (2010 − 1999)	1.6	-2.1919062	-.24383037	.98580688	.5963189
Share of Mirror Exports, ROW (2010 − 1999)	1	.24349236	.24349236	.40381199	.40381199
Share of Mirror Exports, ROW (2010 − 1999)	1.4	-.44724712	.94114006	.67265165	.17331654
Share of Mirror Exports, ROW (2010 − 1999)	1.5	-.58980519	1.0868317	.72233939	.1385556
Share of Mirror Exports, ROW (2010 − 1999)	1.6	-.723791	1.2242849	.76540297	.11042239
Mirror Exports, ROW (2010 − 1999)	1	-1.7693779	-1.7693779	.96158457	.96158457
Mirror Exports, ROW (2010 − 1999)	1.4	-2.4886701	-1.100283	.99358892	.86439556
Mirror Exports, ROW (2010 − 1999)	1.5	-2.6441824	-.96754557	.99590558	.83336431
Mirror Exports, ROW (2010 − 1999)	1.6	-2.7924988	-.84442294	.99738485	.80078346
Mirror Exports, USA (2010 − 1999)	1	-.3408893	-.3408893	.63340652	.63340652
Mirror Exports, USA (2010 − 1999)	1.4	-1.0399183	.34846881	.85081106	.36374408
Mirror Exports, USA (2010 − 1999)	1.5	-1.1862372	.49039957	.88223571	.31192559
Mirror Exports, USA (2010 − 1999)	1.6	-1.3243836	.62369227	.90731215	.26641485
Mirror Exports, EU (2010 − 1999)	1	-1.3473245	-1.3473245	.91106212	.91106212
Mirror Exports, EU (2010 − 1999)	1.4	-2.0606298	-.67224276	.98033082	.7492854
Mirror Exports, EU (2010 − 1999)	1.5	-2.2134259	-.53678906	.98656583	.70429331
Mirror Exports, EU (2010 − 1999)	1.6	-2.3587375	-.41066164	.99083138	.65933967
GSP Imports (2010 − 1999)	1	-1.9317062	-1.9317062	.97330213	.97330213
GSP Imports (2010 − 1999)	1.4	-2.6533012	-1.2649139	.99601454	.89704889
GSP Imports (2010 − 1999)	1.5	-2.8098581	-1.1332211	.99752182	.87143928
GSP Imports (2010 − 1999)	1.6	-2.9593301	-1.0112542	.99845845	.84405261
Non–GSP Imports (2010 − 1999)	1	2.5714285	2.5714285	.005064	.005064
Non–GSP Imports (2010 − 1999)	1.4	1.8834867	3.3323226	.02981722	.00043062
Non–GSP Imports (2010 − 1999)	**1.5**	**1.7496355**	**3.4992709**	**.04009062**	**.00023327**
Non–GSP Imports (2010 − 1999)	1.6	1.6263142	3.6592069	.05194142	.0001265
Non–GSP Imports (2010 − 1999)	2	1.2121831	4.2426405	.11272115	.00001105
USA Imports, USITC (2010 − 1999)	1	-.85714287	-.85714287	.80431706	.80431706
USA Imports, USITC (2010 − 1999)	1.4	-1.5937195	-.14488359	.94450057	.55759859
USA Imports, USITC (2010 − 1999)	1.5	-1.7496355	0	.95990938	.5
USA Imports, USITC (2010 − 1999)	1.6	-1.8973666	.13552603	.97111022	.446098
No Programme (2010 − 1999)	1	-.91428572	-.91428572	.81971663	.81971663
No Programme (2010 − 1999)	1.4	-1.651673	-.20283704	.95069939	.58036882
No Programme (2010 − 1999)	1.5	-1.8079566	-.05832118	.96469337	.52325362
No Programme (2010 − 1999)	1.6	-1.9560946	.07679801	.97477299	.46939212

The calculations in the table are based on Rosenbaum (1987, 1991a,b) The log odds of being in the treatment group is given by the logit model $\log[Pr(T=1|X=x,U=u)/Pr(T=0|X=x,U=x)] = \kappa_x + \gamma u$, where $\gamma = \log(\Gamma)$, for each x, κ_x is an unknown parameter, X is the matching covariates, u is the unobserved variable.

Table 28: Correlations Matrix for Covariates

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Area	1																	
Real GDP	-0.118***	1																
Weighted dist.	0.0695**	-0.0332	1															
Landlocked	0.0670**	-0.272***	0.218***	1														
Voice & Acct.	-0.146***	0.230***	-0.337***	-0.181***	1													
Political Stab.	-0.275***	0.443***	-0.113***	-0.122***	0.645***	1												
Govt Eff.	-0.0998***	0.607***	-0.117***	-0.239***	0.558***	0.632***	1											
Regulat. Qual.	-0.0827**	0.568***	-0.262***	-0.191***	0.555***	0.492***	0.803***	1										
Rule of Law	-0.115***	0.578***	-0.0968***	-0.162***	0.600***	0.682***	0.850***	0.765***	1									
Corruption	-0.151***	0.548***	-0.149***	-0.132***	0.560***	0.680***	0.846***	0.702***	0.835***	1								
Adj. Sav./GNI	-0.0174	0.155***	0.104**	-0.0153	0.0556	0.111***	0.209***	0.212***	0.245***	0.178***	1							
GDP per capita	-0.0979***	0.956***	0.0314	-0.236***	0.168***	0.369***	0.590***	0.562***	0.533***	0.500***	0.174***	1						
AGOA Treat.	0.0951***	-0.334***	0.244***	0.314***	-0.214***	-0.169***	-0.263***	-0.237***	-0.234***	-0.199***	-0.121***	-0.296***	1					
Low Income	-0.00401	-0.388***	0.237***	0.357***	-0.372***	-0.349***	-0.531***	-0.437***	-0.473***	-0.419***	-0.114***	-0.327***	0.340***	1				
Lower Mid. Inc.	-0.0371	-0.302***	0.0707**	0.0167	0.0196	-0.0564*	-0.135***	-0.221***	-0.108***	-0.175***	-0.0742*	-0.328***	0.0348	-0.401***	1			
Upper Mid. Inc.	0.167***	0.138***	-0.260***	-0.218***	0.280***	0.175***	0.314***	0.350***	0.261***	0.310***	0.161***	0.0417	-0.159***	-0.333***	-0.433***	1		
Maj. Christian	-0.0334	-0.0130	-0.359***	-0.0364	0.441***	0.144***	0.0190	0.107***	0.0544	0.00495	-0.115***	-0.0607*	-0.116***	-0.220***	0.111***	0.130***	1	
Maj. Muslim	0.0673*	0.0460	0.156***	-0.0747**	-0.478***	-0.214***	-0.0773**	-0.166***	-0.107***	-0.0851**	0.0296	0.0818**	0.0917**	0.101***	-0.0787**	-0.105***	-0.652***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 29: Correlations Matrix for Outcome Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
No program claimed	1												
GSP Imports	0.472***	1											
Non GSP Imports	0.157***	0.0713*	1										
Non-GSP/Tt Imports	-0.0807**	-0.0750**	0.386***	1									
GSP/Tt Imports	-0.0272	0.274***	-0.0666*	-0.123***	1								
No prog/Tt Imports	0.0927***	-0.0905**	-0.312***	-0.833***	-0.464***	1							
Mirror Exports to EU	0.727***	0.633***	0.169***	-0.0735**	0.0545	0.0510*	1						
Mirror Exports to USA	0.976***	0.543***	0.364***	0.00402	-0.00118	-0.00157	0.738***	1					
Mirror Exports to ROW	0.749***	0.610***	0.0958***	-0.0894***	0.0525	0.0777**	0.782***	0.731***	1				
Mirror Exports Share-ROW	0.00409	0.0475	-0.119***	-0.286***	0.0893**	0.222***	0.00327	-0.0194	0.198***	1			
Mirror Exports Share-EU 25	-0.155***	-0.105***	-0.117***	-0.0667**	-0.00912	0.0633*	0.00904	-0.174***	-0.182***	-0.690***	1		
Mirror Exports Share-USA	0.185***	0.0592*	0.301***	0.459***	-0.101***	-0.371***	-0.00874	0.235***	-0.0426	-0.490***	-0.293***	1	
AGOA Treatment	-0.113***	-0.0270	0.0993***	0.235***	0.0354	-0.256***	-0.0914***	-0.0894***	-0.130***	-0.159***	0.217***	-0.0609*	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$