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Estimating the Tariff-Equivalent of NTMs

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ESTIMATING THE TARIFF-EQUIVALENT OF NTMS

1. Introduction

With the steady decrease in world-wide tariffs accomplished in the various rounds of multilateral trade negotiations over the past several decades, the attention of both policy-makers and economists has turned to the role played by non-tariff methods of protection. Especially for the purpose of negotiations, it is important that the impacts of these NTMs be quantified. Yet this has proven difficult. Variation across countries in product prices is due to many factors of which NTMS are just one. In addition, the many types of NTMs--quotas, non-automatic licensing, bans, prior authorization for protection of human health, local content requirements, among others--defy the development of a simple uniform method to convert the effect of these quantity controls into tariff-equivalents.

Deardorff and Stern (1997) present both a survey of past work in this area and a clear guide to methodological approaches to the problem. They also give a detailed exposition of the calculation of the tariff-equivalent of NTMs using data on individual products, and allowing for different types of NTMs, market competition, and product substitutability. More recently, Bradford (2001) uses OECD data on specific product prices across countries to elicit percentage markups due to protection. Using retail margins and export margins from IO tables to represent distribution and transport costs, Bradford calculates producer prices for products in a number of OECD countries, and compares them to the calculated minimum producer price (plus transport costs). If this ratio is larger than the margin due to a country's tariff on the product, then the larger ratio is taken to represent the aggregate price effect of both tariffs and NTMs.

In the same spirit as Bradford, this paper attempts to estimate the percentage increase in specific product prices across countries due to NTMs. It differs in three key respects. First, price data is drawn from the EIU CityData. This allows estimation over a very large group of products, covering a wide range of industrial and developing countries. Second explicit data on the incidence of NTMs by country and by product are used. We draw on two databases for data on NTM incidence--UNCTAD TRAINS data, and the USITC NTM Database. Third, we develop a differentiated products model which yields an estimating equation. This equation allows us to estimate directly the effect of NTMs on retail prices, while controlling for tariffs, distribution costs, and transport costs. This preliminary draft presents estimates for three GTAP sectors (apparel, shoes, and processed foods), for 18 countries/regional groups. We illustrate the econometric methodology which we plan to extend to a more complete range of sectors, and which we expect to be of use to others studying this issue.

2. Modeling NTMs

The EIU CityData contains prices on more than 160 products and services in 123 cities in 79 countries, since 1990. This offers a unique opportunity to discern the effects of NTMs by comparing goods prices on specific products globally at a point in time. Consider the domestic country with a tariff and an import quota on a good x. Assume good x is produced perfectly competitively in all countries, good x from all sources are considered perfect substitutes for each other, and foreign countries have no trade barriers on these products. Following Deardorff and Stern (1997), we could calculate the gap between the domestic "inside the border" price of imported x, P_d^m, and the c.i.f. price of imported x, P_c^m, as a percentage of the latter. Netting out the *ad valorem* tariff, t, yields

$$TE = [(P_d^m - P_c^m)/P_c^m] - t = r \qquad (1)$$

where ? is the tariff-equivalent (TE) of the rent premium attributable to the domestic country's import quota.

There are several features of the EIU data which make it difficult to calculate TEs using (1). EIU CityData prices are retail prices, e.g., the retail prices of good x in Atlanta and in Berlin. Thus, these prices include distribution costs, C, and transport costs, C_T. They also do not reflect the price of the imported good only, but are composites of both domesticcally-produced goods and imported goods. Thus, the retail price of good x in Atlanta (Berlin) will be a composite of the retail prices of American-made (German-made) x and imported x, and will reflect the tariffs and import quotas maintained by the United States (EU) on good x. One could adapt equation (1) to account for these features. If we maintain the assumption that domestic and imported x are perfect substitutes, and we assume that distribution costs are identical for the domestic and imported good within the same country, then we can express the TE of the domestic country's import quota now as:

$$TE = [((P_R - P_R^*) - (C - C^*) - C_T) / (P_R^* - C^* + C_T)] - (t - t^*) + r^* = r \qquad (1)'$$

where R = retail price and * indicates foreign country variables. However, (1)' shows that an estimate of the TE of the domestic country's import quota, r, now requires a knowledge of the TE of the foreign country's import quota, r^*. This is clearly unavailable. In addition, (1)' requires accurate data on domestic and foreign distribution costs.

Another difficult problem arises because use of (1) or (1)' assumes that domestic and foreign retail prices refer to the same product, or composite of products. Suppose good x was a business shirt. The EIU data gives "brand store" and "chain store" prices for men's business shirts. However, within each of these categories, shirts may be further differentiated by quality, by source country (Italian shirts vs. Chinese shirts), or by features (button-down collars, top-stUSITC hing detail, etc.). If shirts are really a differentiated product, then the composite price in Berlin could differ from that in Atlanta simply because the sources of imported shirts (or shares from those sources, or varieties bought from those sources) differ between the two cities. These differences could lead to a positive quota premium, even if there were no quota on imported shirts. One could adjust (1)' for less than perfect substitutes. However, to make a comparison between retail price in Atlanta and Berlin, one would have to know the bilateral trade patterns of the US and Germany, to be sure that the German price composite accurately reflected the same mixture of imported shirts as that of the United States.

To address these issues, we develop a differentiated products model of retail prices in a city.[1] Suppose that the EIU price of a good x in city *i* is the simple average of all of the varieties of good x found in retail stores in city *i*. Let the number of varieties consumed in city *i* and produced in city *j* be n_{ij}. Then the average price of the varieties from city j (consumed in city i) will be

$$P_{ij} = \left[\sum_{k=1}^{n_{ij}} (P_{j(k)} + m_{ij} + t_{ij} + r_{ij}) \right] \Big/ n_{ij} \qquad (2)$$

where $P_{j(k)}$ denotes the "ex factory" price of variety *k* produced in city *j*, m_{ij} denotes the retail markup in city *i* on variety *k* produced in city *j*, and C_{ij}, t_{ij}, and r_{ij}, are the transport cost, specific tariff and NTM rent, respectively, on imports from *j*. (These are assumed to be the same across varieties from the same source city, hence no *k* subscript).

Let N_i be the total number of varieties consumed in city *i*, and let M be the total number of cities. Then the EIU price of good x in city *i* can be written as a weighted average of the average prices from each source city j:

$$P_i^R = \sum_{j=1}^{M} q_{ij} P_{ij} \qquad (3)$$

where the weights $q_{ij} = (n_{ij} / N_i)$ are the share of total varieties consumed in city i from each source j.

Substituting (2) into (3) yields:

$$P_i^R = \frac{1}{N_i} \sum_{j=1}^{M} \sum_{k=1}^{n_{ij}} (P_{j(k)} + m_{ij} + C_{ij} + t_{ij} + r_{ij}) \qquad (4)$$

If all cities consume the same varieties, then $n_{ij} = n_j, N_i = N$. Given this assumption equation (4) can be written as:

$$P_i^R = \overline{P} + \overline{m} + \sum_{j=1}^{M} q_j (C_{Tij} + t_{ij} + r_{ij}) \tag{5}$$

where $\overline{P} = \frac{1}{N_i} \sum_{j=1}^{M} \sum_{k=1}^{n_{ij}} P_{j(k)}$, $\overline{m} = \frac{1}{N_i} \sum_{j=1}^{M} \sum_{k=1}^{n_{ij}} m_{ijk}$, and $q_j = n_j / N$. Equation (5) gives a relationship between the EIU price in city *i* and the NTM rent on trade between city *i* and every other city. Tariffs and NTMs are imposed at the country level. Thus, for any pair of cities *i* and *j* located in the same country, for any good k, we have $t_{ik} = t_{jk}$, and similarly $r_{ik} = r_{jk}$. Equation (5), along with this set of restrictions, forms the basis of our empirical estimation.

3. Estimation

Equation (5) could be estimated for each product separately, using a cross-section of cities, in a given year. The term $\overline{P}$ would become the constant in the regression, representing the average "ex factory" price of the product, and would be the same across all cities (given the assumptions above). The mark-up due to distribution costs, $\overline{m}$, could be proxied by a vector of city-specific characteristics that we expect to influence retail mark-ups, Z_i.. Transport costs (C_T) would be proxied by a measure of distance (d). Since it is unlikely that data on the domestic country's NTMs on good x *with each partner country* are available, we could instead estimate the aggregate rent premium. One way to do this is to create a dummy variable, NTM_K ,which equals one if a city is located in a country with an NTM on good x, and zero otherwise. This yields the following estimating equation:

$$P_i^R = a_0 + a_1 Z_i + a_2 \left(\sum_{j=1}^{M} q_j d_{ij} \right) + a_3 \left(\sum_{j=1}^{M} q_j t_{ij} \right) + a_4 \left(\sum_{K=1}^{\overline{K}} h_K DUM_K \cdot NTM_K \right) \tag{6}$$

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[1] We are indebted to Rod Ludema for this formulation.

where DUM_K are country dummy variables, which are equal to one if city i is in country K and zero otherwise.

There are systemic problems with estimation of (6) for a single good across all cities in the sample. It is clear that the prices in each city are not independent of each other. These equations represent a sort of reduced form model from a system describing demand and supply for product k in a given city. But the market for good k is a global market, so prices in all cities reflect the determinants of the global market price in a given time t. For example, an increase in the cost of cotton fabric globally, would impact the price of men's business shirts in all cities in a given year. In effect, (6) is really a system of equations, where the implicit final equation shows the global market clearing at the prevailing retail prices in all cities. Thus, the estimation of (6) must include a correction for contemporaneous correlation. In addition, large countries' trade barriers will likely impact prices in smaller countries. Though the specification in (6) assumes that only the domestic country's own trade barriers affect its prices, large exporting or importing countries move global prices, thereby affecting prices in all other smaller countries. This implies another implicit link between prices across cities.

To address these systemic issues, we estimate (6) using pooled cross-city, cross product data. Since the objective is to determine an NTM estimate for each GTAP sector, we pool data across all products in a given sector contained in the EIU CityData.[2] Cities are grouped into regions, where regions represent either one country (e.g., China), or a group of related countries (e.g. the EU 15).[3] The pooled specification is given in (6)':

$$\mathbf{P}_r^s = \mathbf{a}_0'\mathbf{D}_r + a_{1r}\mathbf{Z}_r + a_{2r}?_r'\mathbf{d}_r + a_{3r}?_r'\mathbf{t}_r + a_{5r}\mathbf{DUM}_r \cdot \mathbf{NTM}_r \qquad (6)'$$

where bold type indicates an $((ixk)x1)$ vector, s and r indicate sector and region, respectively. $\mathbf{D}_r$ is a

[2] Sectors are defined in appendix 1.
[3] Regions are defined as a single country whenever there are a sufficient number of city observations available. If only one city was available for a country, that country was grouped with other countries based on (a) a common

vector of product-specific dummy variables, thus $\mathbf{a}_0$ will contain estimates of the "average ex-factory prices of the products within the sector." Equation (6)' is estimated for each sector using SUR, with a correction for region-specific heteroskedasticity.

There are several advantages of using this pooled SUR approach. First, it corrects for contemporaneous correlation between prices in each city for product k (e.g. shirts), in a given year, and between prices for products in the same sector (e.g. shirts, trousers, dresses, etc.). It may also, in part, capture the inter-relationship between large country trade barriers and small country prices. Second, it is flexible enough to yield region-specific parameters (indicated by subscript r on parameters in equation (6)'). In particular, a direct output of the estimation is a country-specific estimate of the average percentage increase in price due to country j's NTMs on products in a given sector.[4] Third, it allows us to use dummy variables to capture the impact of NTMs, despite the limitations of the data on other explanatory variables. Since some explanatory variables vary only across countries rather than cities, a regression on a single product causes collinearity between the NTM dummy and these explanatory variables for regions containing a single country. If there is variation in a country's NTMs across products within a sector, pooling across these products avoids this collinearity problem.

4. Data

All data were obtained for the year 2001. Prices of all products are taken from the EIU CityData. Prices designated as "supermarket" or "chain store" were used rather than "mid-priced" or "branded

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trade policy, or (b) regional proximity and a similar level of development. Regions are defined in appendix 2. The number of cities available for each country is also reported in appendix 2.

store." Three variables were chosen to proxy the local markup on a product in a given city: GDP per capita, wages in a non-traded service, and housing rental costs. Wages on a non-traded service and the price of a non-traded good such as housing may give some indication of local distribution costs. GDP per capita may give an indication of the size of the retail margin that a market can bear. Based on availability across cities, we use the hourly wage for maid service and rental on a 1-bedroom furnished apartment to represent service wages and housing rental.[5] Both of these variables are from the EIU CityData, while GDP per capita is calculated from the World Bank WDI Database.[6] Sensitivity tests were run for alternate proxies, such as rental on 3-bedroom furnished apartments, and monthly wages for maid service. GNI per capita was also used as an alternate measure of purchasing power. The results appear insensitive to the choice of proxies for retail markup.

Transport costs are proxied by GDP-weighted great-circle distance, now commonly used in the gravity model literature to reflect remoteness. The specification in (6)' calls for a weighted distance measure, with weights representing the share of varieties produced in city j, q_{ij}, in country K. Finding a proxy for q_{ij} is difficult. One could assume that q_{ij} is proportional to partner country K's share of global output of the good, or partner country K's share of global exports of the good. Alternatively one might assume that q_{ij} is proportional to the domestic country's share of imports from partner country K. Data for most of these proxies is not readily available across a large number of products and countries. In estimating (6)' , we do not include any proxy for q_{ij}. If the share of varieties from any country K is positively correlated with GDP of country K, then GDP-weighted distance may adequately represent the specification in (6)'.

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[4] These parameters must be corrected for bias. See discussion below.
[5] Rental on commercial property is available widely for industrial countries only. In some developing countries these rentals may not be representative of the costs of doing business locally.
[6] Unfortunately city income per capita is only readily available for the United States. Hence the estimation uses country level data.

Products in the EIU CityData were matched with products at the HS 4-digit (or HS 6-digit level where possible), in order to obtain tariff and NTM data.[7] Tariff data were obtained from the UNCTAD TRAINS database using WITS. In most cases these data are for 2001, though for some countries the latest available information was from 1997-1999. The specification in (6)' calls for data on specific tariffs levied on good k imported from city j (in country K), weighted by q_{ij}. For simplicity, we chose to use unweighted MFN *(ad valorem)* tariffs in our estimation. Where countries are members of a customs union (e.g., Mercosur) or economic union (e.g., the EU), the CET was used. Note that most countries impose tariffs on a particular good globally, making distinctions with respect to MFN partner countries, and with respect to partners in preferential trade agreements. If the domestic country imposes the same tariff on good k on all partner countries, and these partners produced all varieties of good k, then the specification in (6)' would reduce to simply $a_3 t$. Thus, the more a country trades with its MFN partners, and the larger share of global varieties produced by these partners, the better approximation the MFN tariff will be to the specification in (6)'. The use of *ad valorem* instead of specific tariff is simply due to data availability.

Data on NTMs were obtained from two sources. A dummy variable was created using the TRAINS database, which takes a value of 1 if a country has any type of "Quantity Control Measure" recorded for a product, and zero, otherwise. This includes import quotas, prohibitions, non-automatic licensing, VERs, prior authorizations for human or animal health, environment, etc.[8] Another dummy variable was created based on the USITC NTM Database. This dummy variable took a value of 1 if the USITC NTM Database showed the presence of an import restriction, import quota or prohibition, import license, import surcharges or customs measures considered to be impediments to trade.

While the TRAINS NTM measure and the USITC NTM measure were chosen to reflect similar

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[7] The corresponding products and HS codes are shown in the appendix.
[8] This designation refers to Control Measures designated as 6100-6900 in the TRAINS database.

types of NTMs, the databases are likely to reflect different--perhaps complementary---information. TRAINS records the presence of NTMs as reported by official governments. The USITC NTMs are constructed largely from complaints from the private sector about impediments to trade in a particular country. Thus, we introduce these two NTM measures using four different specifications. In the first and second specification, we introduce, respectively, the TRAINS NTM and USITC NTM dummy variable alone. The third specification includes both dummy variables, and assesses their net impact on a region's prices[9]. Finally, the fourth specification introduces a composite dummy which takes a value of 1 if either the TRAINS or USITC dummy variable records the presence of an NTM.

5. Results

In this paper, we investigate the impact of NTMs on three GTAP sectors: apparel (28), shoes (29), and processed food (25). Estimates of the tariff equivalents of the NTMs in each of these sectors are reported in tables 1-3, respectively. Testing revealed that estimation of (6)' with continuous variables in logs rather than levels fit the data best. Thus, these estimates are obtained from log-linear regressions.[10] (Full regression results are not reported, but may be obtained from the authors upon request.) Ideally, we would like to allow the coefficients on distance, tariff, and the retail margin proxy variables to vary across regions. However, the lack of sufficient variation in these variables across some regions prevented estimation of region-specific parameters. We were able to allow the regional retail margin variables to have product-specific parameters. For example, we were able to allow children's, men's, and women's shoes to respond differently to the retail margin proxy variables.

As shown by Halvorson and Palmquist (1980), the coefficients on the NTM dummy variables in

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[9] In two cases, only one dummy will enter the regression: if either dummy variable shows no NTMs in the sector; if both NTM dummies are identical.

[10] It is important to note that a log-linear version of (6)' looks very similar to the specification which would emerge from a homogeneous products-perfect competition model. In that case, retail prices would simply be

(6)' may be transformed into the percentage markup in price (tariff-equivalent) by taking the anti-log of the coefficient and subtracting 1. Kennedy (1981) notes that the Halvorson/Palmquist transformation is biased upward, and develops a correction.[11] More recently van Garderen and Shah (2002) argue that the Kennedy correction should be used with an approximate unbiased variance estimator to construct t-statistics.[12] Thus, the TE estimates in tables 1-3 are constructed using the Kennedy transformation. Statistical significance is determined using standard errors calculated from the van Garderen and Shah approximate unbiased variance estimator.

The first two columns of each table report the regions for which the TRAINS Database or the USITC NTM Database record NTMs on at least one product in at least one country within a region. Note that even if both databases record NTMs for a region, they may refer to different products and or different countries within that region. The next four columns give the TEs under each of the four alternate NTM specifications. Only TEs which are positive and significant at the 10 percent level or above are reported in the tables. The TEs should be viewed as estimates of the percentage premium on products restricted by an NTM in a country in that region, relative to the price in countries without NTMs.

Apparel

Both the TRAINS and the USITC NTM Databases report a number of regions with NTMs on apparel. Notably, both databases record NTMs for the United States, the EU, and Canada--the three industrial countries (regions) with well-known VER agreements restricting many apparel products under

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$P_r = P_w(1+m)(1+t)(1+d)(1+r)$, where µ, t, d, and ? are the percentage markups due to distribution costs, tariffs, transport costs and the NTM, respectively. Taking logs of both sides yields: $\ln P_r = \ln P_w + \ln \tilde{m} + \ln \tilde{t} + \ln \tilde{d} + \ln \tilde{r}$, where ~ indicates one plus the variable.

[11] Using this transformation the tariff-equivalent (in percent) is $TE = 100 * [\exp(\hat{c} - 0.5 * \hat{V}(\hat{c})) - 1]$, where c, V are coefficient, and variance, respectively, and ^ indicates estimated value.

[12] Van Garderen and Shah argue that the Kennedy transformed estimator is itself biased, but that this bias goes to zero asymptotically as the sample size grows. They also suggest this is true for their own approximate unbiased variance estimator is: $\tilde{V}(TE) = 100^2 * [\exp(2\hat{c})][\exp(-\hat{V}(\hat{c})) - \exp(-2\hat{V}(\hat{c}))]$ They demonstrate that the

the ATC. However, other regions also appear to have some quantitative restrictions. Both databases record NTMs for MERCOSUR and for Turkey and the Middle East[13], and both record no NTMs for China. For the other regions, the databases give diverging conclusions. This suggests that the two databases may be providing different information--official, tariff-line records vs. broad product level complaints from exporting countries.

For the Canada, the EU and the United States, the TE estimates are plausible, when compared to the estimates in previous literature.[14] Canadian retail prices on apparel with NTMs are 20 to 35 percent higher (on average) than apparel products with no NTMs. For the EU, apparel retail prices are 19 to 34 percent higher due to the EU's NTMs. Estimates for the US show slightly smaller values than Canada and the EU. US NTMs on apparel raise US apparel retail prices between 17 and 24 percent, relative to apparel products with no NTMs.

Latin America and the Former Soviet Union and Eastern Europe also register rather large TEs due to NTMs. Estimates for MERCOSUR suggest that when a country in this region has an NTM on apparel, its prices are between 31 and 39 percent higher than countries without NTMs on apparel. Countries in Mexico/Central America with NTMs have 137-152 percent higher prices on apparel than those without, while Other Latin American countries experience 56-66 percent higher prices due to their NTMs. Estimates for countries with NTMs in the FSU and Eastern Europe show much smaller TEs of 25-32 percent.

Oddly, Japan is estimated to have 68-79 percent markups on apparel products with NTMs. Yet, in other literature (and in the TRAINS database) Japan is considered to have no NTMs on apparel imports (Yang, 1994). Another anomaly appears is East Asia, which shows TE estimates ranging from 31-43

difference between this estimator and the exact unbiased variance estimator approaches zero as the sample grows larger.

[13] The USITC NTM Database has very little data for this region, while the TRAINS database has data on all but one (see appendix 2.) Thus, TE estimates may differ widely between specifications (1) and (2), and may not be feasibly estimated in specifications (3) and (4). This problem occurs in all three sectors discussed in the paper.

percent. These results suggests that perhaps the NTM variable is picking up some country-fixed effects, such as variation in cost-of-living, which have not been adequately controlled for by the retail margin variables. In that case, these estimates are likely to be overstated. This reinforces the importance of modifying the estimation to allow for region-specific responses to all variables.

Shoes

In table 2, both databases show the FSU and Eastern Europe, MERCOSUR, Turkey and the Middle East, and the United States as having NTMs on shoes. They also both agree that the two African regions, Other Latin American countries, Southeast Asia, China and Canada have no NTMs (as defined above) on shoes. Only the NTMs of MERCOSUR and Mexico/Central America show consistently positive and statistically significant effects on retail prices. If a country in MERCOSUR has NTMS on shoes, prices are 93-99 percent higher than countries without NTMs on shoes. The price premium for a country with NTMs on shoes in the Mexico/Central America region is 38-48 percent.

Processed Food

Many countries are reported to have NTMs on processed food according to both databases (table 3). According to the TRAINS database, these NTMs are more often than not non-automatic licenses or prior authorizations for the protection of human or plant health. The databases agree that Southern Africa, the EU, Other Latin America, MERCOSUR, and Southeast Asia all have NTMs on some processed food products in some countries within each region, while China has none.

Only the NTMs of Southern Africa and Other Latin America have positive, statistically significant effects on processed food prices. In Southern Africa, an NTM on a processed food product raises the price by 53-54 percent above those processed food products with no NTMs. In Other Latin America, three out of four specifications indicated positive TEs on processed food, but only the composite specification yielded a positive and significant estimate. If a country in this region has an

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[14] See, for example, Khaturia, et al. (2001), USITC (2002), Francois and Spinanger (2000).

NTM on processed food products this specification indicates a 13 percent price increase over those countries without NTMs on these products. Since product standards on food for the protection of human health are common across many countries, these estimates may help delineate cases where either the standards or the implementation of those standards acts as a trade barrier.

6. Conclusions, Caveats and Extensions

The preliminary results shown for the apparel, shoes and processed foods sectors, suggests that this econometric approach may yield useful estimates of the tariff-equivalents of NTMS. Interestingly, the method of introducing the NTM variables into the regression did not seem to be critical to the estimation of the tariff-equivalent of these barriers. While the four different specifications did yield a range of estimates for the tariff-equivalent of the NTMs, the range was not usually very wide--roughly 5 to 10 percentage points for a given region and product. In addition, the four specifications nearly always yielded similar conclusions as to which regions' NTMs have significant effects on prices and which do not.

While these results are encouraging, there are a number of caveats that suggest further work needs to be done. Given the imperfect nature of the proxies used to capture retail margins and transport costs, it would make sense to allow region-specific responses to these variables. At present, limitations in the data prevent this. As a result, the TE estimates may actually pick up country-specific cost-of-living effects which have not been adequately represented by the other variables. In addition, estimation of the coefficients on a number of the other variables--such as the tariff and GDP per capita--are consistently not significant or wrong-signed. Where the data does allow region-specific parameters, this problem often disappears. However, instead the TE estimates for some countries become absurdly inflated. In future work, we will attempt to iron out these problems, and to extend our estimates to a large number of other sectors.

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Table 1. Apparel

REGION	Country	Catalogue of NTMs: TRAINS	Catalogue of NTMs: USITC	Increase in price due to own NTM[1] (%): TRAINS (1)	USITC (2)	TRAINS & USITC (3)	COMPOSITE (4)
1a	Southern Africa	x					
1b	Other Sub-Saharan Africa						
2	Australia/New Zealand						
3	EU	x	x	19	31	31	34
4	FSU and E. Europe		x		32	28	25
5	Other Latin America		x		63	57	66
6	MERCOSUR	x	x	36		39	31
7	Mexico/ Central America		x		152	137	146
8	Southeast Asia		x				
9	South Asia	x					
10	East Asia	x		31		37	43
11	China						
12	Canada	x	x	20	28	32	35
13	Japan		x		68	79	71
14a	Turkey and Middle East[4]	x	x	88	18	([2])	38
14b	North Africa						
15	EFTA						
16	US	x	x		17	22	24
Obs.				1164	1114	1164	1174

[1] Estimates corrected using Kennedy (1981) correction. Standard errors corrected using Van Garderen-Shah (2002) approximate unbiased variance estimator. Only estimates which are positive and significant at the 10 percent level or above are shown. Estimates rounded to the nearest integer.
[2] The USITC NTM Database has no information on a number of countries in this region. Thus, inclusion of this NTM dummy was not possible.
[3] Missing data on other explanatory variables rendered estimation of the TE of this NTM impossible.
[4] The range of estimates is wide because the two databases have data on different countries within this region.

Table 2. Shoes

		Catalogue of NTMs		Increase in price due to own NTM[1] (%)			
		TRAINS	USITC	TRAINS (1)	USITC (2)	TRAINS & USITC (3)	COMPOSITE (4)
REGION	**Country**						
1a	Southern Africa						
1b	Other Sub-Saharan Africa						
2	Australia/New Zealand	x					
3	EU	x					
4	FSU and E. Europe	x	x				
5	Other Latin America						
6	MERCOSUR	x	x	97	99	93	95
7	Mexico/ Central America		x		48	40	38
8	Southeast Asia						
9	South Asia	x					
10	East Asia	x					
11	China						
12	Canada						
13	Japan		x				
14a	Turkey and Middle East	x	x	82		([2])	
14b	North Africa	x					
15	EFTA	x					
16	US	x	x				
Obs.				415	402	419	422

[1] Estimates corrected using Kennedy (1981) correction. Standard errors corrected using Van Garderen-Shah (2002) approximate unbiased variance estimator. Only estimates which are positive and significant at the 10 percent level or above are shown. Estimates rounded to the nearest integer.

[2] The USITC NTM Database has no information on a number of countries in this region. Thus, inclusion of this NTM dummy was not possible.

[3] Missing data on other explanatory variables rendered estimation of the TE of this NTM impossible.

Table 3. Processed Food

REGION	Country	Catalogue of NTMs: TRAINS	Catalogue of NTMs: USITC	Increase in price due to own NTM[1] (%): TRAINS (1)	USITC (2)	TRAINS & USITC (3)	COMPOSITE (4)
1a	Southern Africa	x	x	54		54	53
1b	Other Sub-Saharan Africa	x					
2	Australia/New Zealand	x					
3	EU	x	x				
4	FSU and E. Europe	x					
5	Other Latin America	x	x				13
6	MERCOSUR	x	x				
7	Mexico/ Central America	x					
8	Southeast Asia	x	x				
9	South Asia	x					
10	East Asia	x					
11	China						
12	Canada	x					
12	Japan	x		([2])		([2])	([2])
14a	Turkey and Middle East		x				([3])
14b	North Africa	x					
15	EFTA	x					
16	US	x					
Obs.				1418	1178	1328	1433

[1] Estimates corrected using Kennedy (1981) correction. Standard errors corrected using Van Garderen-Shah (2002) approximate unbiased variance estimator. Only estimates which are positive and significant at the 10 percent level or above are shown. Estimates rounded to the nearest integer.
[2] The USITC NTM Database has no information on a number of countries in this region. Thus, inclusion of this NTM dummy was not possible.
[3] Missing data on other explanatory variables rendered estimation of the TE of this NTM impossible.

APPENDIX 1. EIU CityData Product/GTAP/HTS Concordances

GTAP Sector	EIU CityData Product	HTS
4	**Apples (1 kg)**	080810
4	**Bananas (1 kg)**	080300
4	**Carrots (1 kg)**	070610
4	**Lemons (1 kg)**	080530
4	**Lettuce (one)**	070511
4	**Mushrooms (1 kg)**	070951
4	**Onions (1 kg)**	070310
4	**Oranges (1 kg)**	080510
4	**Potatoes (2 kg)**	070190
4	**Tomatoes (1 kg)**	070200
10	**Eggs (12)**	040700
14	**Fresh fish (1 kg)**	0302
19	**Beef: ground or minced (1 kg)**	0201, 0202
19	**Beef: roast (1 kg)**	0201, 0202
19	**Beef: stewing, shoulder (1 kg)**	0201, 0202
19	**Beef: filet mignon (1 kg)**	0201, 0202
19	**Lamb: chops (1 kg)**	0204
19	**Lamb: leg (1 kg)**	0204
19	**Lamb: Stewing (1 kg)**	0204
19	**Beef: steak, entrecote (1 kg)**	0201, 0202
19	**Veal: chops (1 kg)**	0201, 0202
19	**Veal: fillet (1 kg)**	0201, 0202
19	**Veal: roast (1 kg)**	0201, 0202
20	**Bacon (1 kg)**	021012
20	**Chicken: fresh (1 kg)**	0207
20	**Chicken: frozen (1 kg)**	0207
20	**Ham: whole (1 kg)**	021011
20	**Pork: loin (1 kg)**	0203
20	**Pork: chops (1 kg)**	0203

GTAP Sector	EIU CityData Product	HTS
21	**Margarine, 500g**	151710
21	**Olive oil (1 l)**	1509
21	**Peanut or corn oil (1 l)**	150890, 151529
22	**Butter, 500 g**	040510
22	**Cheese, imported (500 g)**	0406
22	**Milk, pasteurised (1 l)**	040120
22	**Yoghurt, natural (150 g)**	040310
23	**White rice, 1 kg**	100630
24	**Sugar, white (1 kg)**	1701
25	**Cocoa (250 g)**	180500
25	**Cornflakes (375 g)**	190410
25	**Drinking chocolate (500 g)**	180610
25	**Frozen fish fingers (1 kg)**	160420
25	**Flour, white (1 kg)**	110100
25	**Ground coffee (500 g)**	0901
25	**Instant coffee (125 g)**	0901
25	**Orange juice (1 l)**	2009
25	**Peaches, canned (500 g)**	200870
25	**Peas, canned (250 g)**	200540
25	**Sliced pineapples, canned (500 g)**	200820
25	**Spaghetti (1 kg)**	190219
25	**Tea bags (25 bags)**	090230
25	**Tomatoes, canned (250 g)**	200210
25	**White bread, 1 kg (mid-priced**	190590
26	**Beer, local brand (1 l)**	220300
26	**Beer, top quality (330 ml)**	220300
26	**Cognac, French VSOP (700 ml)**	220820
26	**Gin, Gilbey's or equivalent (700 ml)**	220850

GTAP Sector	EIU CityData Product	HTS
26	Liqueur, Cointreau (700 ml)	220870
26	Scotch whisky, six years old (700 ml)	220830
26	Vermouth, Martini & Rossi (1 l) 1	220510
26	Wine, common table (1 l)	220421
26	Wine, fine quality (700 ml)	220421
26	Wine, superior quality (700 ml)	220421
26	Coca-Cola (1 l)	220210
26	Mineral water (1 l)	220110
26	Tonic water (200 ml)	220210
26	Cigarettes, local brand (pack of 20)	240220
26	Cigarettes, Marlboro (pack of 20)	240220
26	Pipe tobacco (50 g)	240310
28	Socks, wool mixture	6115
28	Tights, panty hose	6115
28	Women's cardigan sweater	6110
28	Boy's jacket, smart	620331-620333
28	Business suit, two piece, med. weight	620311, 620312
28	Boy's dress trousers	620341, 620343
28	Child's jeans	620342
28	Dress, ready to wear, daytime	6204
28	Girl's dress	6204
28	Business shirt, white	620520. 620530
28	Mens raincoat, Burberry type	620112, 620113
28	Women's raincoat, Burberry type	620212, 620213
29	Child's shoes, dresswear	640420
29	Men's shoes, business wear	640420
29	Child's shoes, sportswear	640411
29	Women's shoes, town	640420
31	Toilet tissue (two rolls)	481810
31	Facial tissues (box of 100)	481820

GTAP Sector	EIU CityData Product	HTS
31	Daily local newspaper	490210
31	International foreign daily newspaper	490210
31	Paperback novel (at bookstore)	4901
31	International weekly news magazine	490290
32	Regular unleaded petrol (1 l)	2710
32	Heating oil (100 l)	2710
33	Dishwashing liquid (750 ml)	340220
33	Insect-killer spray (330 g)	380810
33	Laundry detergent (3 l)	340220
33	Soap (100 g)	340111
33	Aspirins (100 tablets)	291822
33	Hand lotion (125 ml)	330430
33	Lipstick (deluxe type)	330410
33	Shampoo & conditioner in one (400 ml)	330510
33	Toothpaste with fluoride (120 g)	330610
33	Kodak colour film (36 exposures)	370231
37	Frying pan (Teflon or equivalent)	732393
37	Razor blades (five pieces)	821220
38	Compact car (1300-1799 cc)	8703
38	Deluxe car (2500 cc upwards)	8703
38	Family car (1800-2499 cc)	8703
38	Low priced car (900-1299 cc) 2	8703
40	Television, colour (66 cm)	852812
40	Personal computer (64 MB)	847141
41	Batteries (two, size D/LR20)	8506
41	Electric toaster (for two slices)	851672
41	Light bulbs (two, 60 watts)	853922
41	Compact disc album	852432

APPENDIX 2. Regional Groups used in Estimation (number of cities in parentheses)

Region #	Region Name	Region #	Region Name	Region #	Region Name
1.1	**Southern Africa**	**5**	**Rest of South America**	**10**	**East Asia**
	Zimbabwe (1)		Chile (1)		Hong Kong (1)
	South Africa (1)		Colombia (1)		South Korea (1)
			Venezuela (1)		Singapore (1)
1.2	**Rest of SSA**		Peru[1] (1)		Chinese Taipei (1)
	Cameroon (1)		Ecuador (1)		
	Cote D'Ivoire[1] (1)			**11**	**China** (5)
	Gabon (1)	**6**	**MERCOSUR**		
	Kenya (1)		Argentina (1)	**12**	**Canada** (4)
	Nigeria (1)		Brazil (2)		
	Senegal[1] (1)		Paraguay (1)	**13**	**Japan** (2)
			Uruguay (1)		
2	**AUS/NZ**			**14.1**	**Turkey & Middle East**
	Australia (5)	**7**	**Mexico and CA**		Turkey (1)
	New Zealand (2)		Mexico (1)		
			Costa Rica (1)		Israel[2] (1)
3	**EU-15** (23)		Guatemala (1)		Bahrain[1] (1)
			Panama (1)		Jordan[1] (1)
4	**Russia/EE**				Saudi Arabia[1] (3)
	Azerbaijan[2] (1)	**8**	**SE Asia**		
	Czech Republic (1)		Indonesia (1)	**14.2**	**North Africa**
	Hungary (1)		Malaysia (1)		Morocco (1)
	Poland (1)		Philippines (1)		Egypt (1)
	Romania (1)		Thailand (1)		Tunisia (1)
	Russian Federation (2)		Vietnam (2)		
				15	**EFTA**
		9	**South Asia**		Iceland (1)
			Bangladesh (1)		Norway (1)
			India (2)		Switzerland (2)
			Sri Lanka[1] (1)		
			Pakistan (1)	**16**	**USA** (16)

[1] No data available for this country in the USITC NTM Database. [2] No recent data available for this country in the TRAINS Database.