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The Effects of Non-Tariff Measures on Prices, Trade, and Welfare: CGE Implementation of Policy-Based Price Comparisons

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COMMENTS WELCOME

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The Effects of Non-Tariff Measures on Prices, Trade, and Welfare: CGE Implementation of Policy-Based Price Comparisons

ABSTRACT: The global economic effects of eliminating certain significant categories of non-tariff measures (NTMs) are estimated in a CGE context. As a first step, a database of institutional information identifying alleged instances of NTMs for particular products and countries is constructed based on WTO, U.S. Government, and EU sources, and compared with the UNCTAD policy inventory. This database is then concorded to a GTAP-feasible multiregion, multisector aggregation. Retail price data from the EIU CityData database, similarly concorded, are analyzed econometrically, taking into account systematic deviations from purchasing-power parity, to determine whether and to what extent the presence of alleged NTMs is associated with significantly higher prices. The estimated price effects are then used to calibrate a CGE simulation in order to obtain simulation estimates of trade and welfare effects of their removal, which can be disaggregated. Removal of the categories of NTMs under consideration yields global gains on the order of $90 billion. These gains arise notably from liberalization by Japan and the European Union by region, and from liberalization of apparel and machinery/equipment by sector.

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.

This paper attempts the fairly ambitious task of estimating price gaps describing the full range of global merchandise trade, both by region and sector. It does so, first, by applying a uniform methodology across sectors to estimate the price gap, taking account of systematic international deviations from purchasing-power-parity. These deviations are considered to come from non-tradability, particularly in services such as wholesale and retail distribution, and a common set of proxies is used to capture international price differences arising from such tradability. The econometric method also takes advantage of available policy data for identification. That is, it attributes a positive price gap only in cases where NTMs have been alleged or notified, not simply in cases where prices are unusually high. Finally, CGE simulation methods are used to assess the relative significance of the estimated price gaps in welfare terms by region and sector.

In pursuing this approach we are open to the criticism that careful estimation of price gaps is best done on a handicraft rather than a mass-production basis, as has often been done in the past. The advantage of intense focus on individual policies, products, and countries is that data can be selected which more closely approximates the ideal envisioned by the price-gap methodology. The advantage to the present approach is that a set of estimates for all tradable products and all regions can be obtained with a common methodology. Having a complete set of estimates is useful for making broad comparisons, but not as useful in assessing specific policies. Readers familiar with particular markets and policies may find the estimates for the associated regions and sectors to be wide of the mark. It is hoped that the ability of the present method to provide a comprehensive set of estimates both justifies the approach, and will stimulate further research.

2. Price Gaps And Simulations – Initial Considerations

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.

A recent set of studies by Kee, Nicita, and Olarreaga (2004a-b) also provides *ad valorem* equivalents (AVEs) of non-tariff barriers. Kee et al. provide estimates for a much larger group of developed and developing countries than Bradford, and at a much higher level of disaggregation (HS 6-digit). However, in contrast to Bradford the authors do not have price data at this level of disaggregation. Thus, Kee, et al., first estimate the impact of price and quantity control measures as well as domestic agricultural price supports on trade flows. They then translate these quantity effects into price effects using their own separately estimated demand elasticites (Kee, et al., 2004b).

In the spirit of Bradford and of Kee, et al., this paper attempts to estimate the percentage increase in specific product prices across countries due to NTMs. It makes three contributions. First, the price impacts of NTMs are estimated for a large group of industrial and developing countries, and for many products, by using actual price data drawn from the EIU CityData. With prices on more than 160 products and services in 123 cities in 79 countries, since 1990, this data offers a unique opportunity to discern the effects of NTMs by comparing goods prices on specific products globally at a point in time. Second, explicit data on the incidence of NTMs by country and by product is used. This data is drawn from two complementary databases--UNCTAD TRAINS data, and the USITC NTM Database (Manifold and Donnelly (2003)). Third, the price impacts of NTMs are estimated directly, using an equation derived from a differentiated products model of retail prices. This draft presents preliminary estimates for 14 product groups and 18 countries/regional groups.

3. Modeling NTMs – A Theoretical Framework

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, τ, yields

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

where ρ 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 domestically-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:

$$TE = [((P_R - P_R^*) - (C - C^*) - C_T)/(P_R^* - C^* + C_T)] - (\tau - \tau^*) + \rho^* = \rho \qquad (1)'$$

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, ρ, now requires a knowledge of the TE of the foreign country's import quota, ρ^*. 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-stitching 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. 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

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

where $P_{j(k)}$ denotes the "ex factory" price of variety *k* produced in city *j*, μ_{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:

$$P_i^R = \sum_{j=1}^{M} \theta_{ij} P_{ij} \tag{3}$$

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

Substituting (2) into (3) yields:

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

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

$$P_i^R = \overline{P} + \overline{\mu} + \sum_{j=1}^{M} \theta_j (C_{Tij} + t_{ij} + r_{ij}) \qquad (5)$$

where $\overline{P} = \dfrac{1}{N_i} \sum_{j=1}^{M} \sum_{k=1}^{n_{ij}} P_{j(k)}$, $\overline{\mu} = \dfrac{1}{N_i} \sum_{j=1}^{M} \sum_{k=1}^{n_{ij}} \mu_{ijk}$, and $\theta_j = n_j / N$. 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.

4. 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, $\overline{\mu}$, 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:

$$P_i^R = \alpha_0 + \alpha_1 Z_i + \alpha_2 \left(\sum_{j=1}^{M} \theta_j d_{ij} \right) + \alpha_3 \left(\sum_{j=1}^{M} \theta_j t_{ij} \right) + \alpha_4 \left(\sum_{K=1}^{\overline{K}} \eta_K DUM_K \cdot NTM_K \right) \qquad (6)$$

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

There are four main problems that arise when estimating equation (6) for a single good across all cities in the sample. First, the data include prices from multiple cities in the same country. It is likely that these prices will be affected by country-specific characteristics not captured by other variables in the model. In addition, the error variance may be homoskedastic for cities within a country, but not across cities in different countries. This first issue is addressed by treating the data as a panel (cross-country, over cities). 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).[1] Equation (6) is then estimated using GLS estimation with regional fixed effects and a correction for group-wise heteroskedasticity.

Equation (6) assumes that only own-country trade policies affect prices in cities within a country. However, it is clear that large countries trade barriers will impact the "world price," and hence prices in all cities. This second problem is addressed only indirectly. We assume that any impact of large country trade policy on smaller countries prices is already captured in our estimate of the average world (or ex-factory) price of the product (the coefficient α_0).

The third problem arises because prices in each city are not independent of each other. The price equations represented by (6) can be seen as part of a system of structural equations describing demand and supply for product k in the global market. The implicit final equation in this system would be the constraint that the global market clears at the set of retail prices prevailing in all cities. Clearly the price data we will work with are not necessarily equilibrium prices. However, at any point in time, excess demand (supply) in one market would imply all prices adjusting until that excess demand (supply) is eliminated. This interdependence means that the error terms are likely to be contemporaneously correlated. To address this problem we estimate (6) using SUR.

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[1] 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

Finally, the fourth problem with estimating (6) using price data across cities for a single product, is that the effect of an NTM will be indistinguishable from a country fixed-effect. To address this problem, we pool the data on like products in the EIU CityData together.[2] For example, instead of estimating the impact of an NTM on the price of men's business shirts, we pool all 12 apparel products together, and estimate the average impact of NTMs on "apparel." This not only helps solve the fourth problem, but generates estimates which can be used to represent the impact of NTMs on each GTAP sector.

The pooled specification is given in (6)′:

$$\mathbf{P}_r^s = \boldsymbol{a}_0' + \boldsymbol{a}_1'\boldsymbol{RG}_r + \boldsymbol{\alpha}_2'\boldsymbol{D}_r + \alpha_3\mathbf{Z}_r + \alpha_4\ \boldsymbol{\theta}_r'\mathbf{d}_r + \alpha_5\boldsymbol{\theta}_r'\mathbf{t}_r + \boldsymbol{a}_{6r}'\mathbf{DUM}_r \cdot \mathbf{NTM}_r \qquad (6)'$$

where bold type indicates a vector, s and r indicate sector and region, respectively. The constant term $\boldsymbol{a}_0'$ estimates the average price of the products in the particular product group. $\mathbf{RG}_r$ is an (i·(k-1)x1) vector of region-specific dummy variables, thus $\boldsymbol{a}_0'$ will contain estimates of fixed effects which cause regional prices to deviate from the average price in the sector. Since average "ex-factory" prices in a sector will vary across product, an (i·(k-1)x1) vector of product dummy variables, $\boldsymbol{D}_r$, is also included. Other variables are defined as before. Equation (6)′ is estimated for each sector using SUR, with a correction for region-specific heteroskedasticity.

54. Data

All data were obtained for the year 2001. Prices of all products are taken from the EIU CityData. To avoid spurious differences, price data designated as "supermarket" or "chain store" were used rather than "mid-priced" or "branded store." Three variables were chosen to proxy the local markup (Z) on a product in a given city: GDP per capita, wages in a non-traded service, and housing rental costs. Wages

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trade policy, or (b) regional proximity and a similar level of development. Regions are defined in appendix 1. The number of cities available for each country is also reported in appendix 1.

[2] Sectors are defined in appendix 2.

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.[3] Both of these variables are from the EIU CityData, while GDP per capita is calculated from the World Bank WDI Database.[4] 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, θ_{ij}, in country K. Finding a proxy for θ_{ij} is difficult. One could assume that θ_{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 θ_{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 θ_{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)′.

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.[5] Tariff data were obtained from the UNCTAD

[3] 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.
[4] Unfortunately city income per capita is only readily available for the United States. Hence the estimation uses country level data.
[5] The corresponding products and HS codes are shown in appendix 2.

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 θ_{ij}. For simplicity, we chose to use unweighted MFN *(ad valorem)* tariffs in our estimation.[6] Where countries are members of a customs union (e.g., Mercosur) or economic union (e.g., the EU), the *ad valorem* CET was used. Note that most countries impose tariffs on a particular good globally, making distinctions with respect to MFN and non-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 $\alpha_3 t$. 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.[7] 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 types of NTMs, the databases are likely to reflect different--perhaps complementary---information. Data for TRAINS are

[6] Some countries apply specific and or compound tariffs to particular HS lines. We were able to use the recent ad valorem equivalent option in WITs to convert these to AVEs in some sectors. We plan to update the remaining sectors.
[7] This designation refers to Control Measures designated as 6100-6900 in the TRAINS database.

collected from publicly available sources, such as official governments other commercially available publications, by UNCTAD as well as by the International Trade Centre, UNCTAD/WTO (ITC).[8] They are reported at the HS tariff line level. The USITC NTMs are constructed largely from complaints from the private sector about impediments to trade in a particular country.[9]

As a test case, we introduced these two NTM measures using four different specifications: TRAINS NTM dummy alone, USITC NTM dummy alone, both dummy variables entered individually, and a composite dummy which took a value of 1 if either database recorded the presence of an NTM. Using apparel, leather products and processed food as test cases, we found that the method of introducing the NTM variables into the regression did not seem to be critical to the estimation of the tariff-equivalent of the barriers. The four specifications nearly always yielded similar conclusions regarding which regions' NTMs had significant effects on prices and which did not. In addition, while the four specifications yielded a range of estimates, the range was not usually very wide. Therefore, in this paper we present results for 14 sectors and 18 regions/countries using the composite TRAINS/USITC NTM dummy.

6. Econometric Results

Table 1 reports the regions and sectors in which the TRAINS Database (T) or the USITC NTM Database (U) 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. In general, many of the countries/regions have NTMs in the sectors for which we have data. Not surprisingly there are more reports of NTMs in TRAINs than in the USITC NTM database. This may be because TRAINS reports NTMs at a much more disaggregated product level, and uses a

[8] Information on other organizations involved in TRAINS data collection may be found in the FAQ section of the WITS software.
[9] This information is drawn from 3 sources: EU's Market Access Database (http://mkaccdb.eu.int); USTR's National Trade Estimate Reports (http://www.ustr.gov/reports/index.shtml); WTO's Trade Policy Reviews (http://www.wto.org/english/tratop_e/tpr_e/tpr_e.htm).

much more finely defined, lengthy list of quantity control measures. It may also indicate that complaints are less likely to occur against regions which constitute smaller markets.[10]

In quite a few cases, both databases indicate the presence of an NTM. However, some noteworthy differences do appear. For example, the TRAINS database indicates that Australia and New Zealand have at least some type of QR on some products in nearly all sectors, however, the USITC NTM Database reports none for this region. Canada receives a similar report card. In contrast, TRAINS indicates almost no QRs for Japan or China, while the USITC NTM Database shows them in 5 sectors in these regions.

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.[11] 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 variation in maid's wages and apartment rents. For most sectors the proxies used to capture retail margins work well. In particular, service wages and housing rents are nearly always strongly significant and positively related to retail prices. Strong positive relations between the tariff, GDP per capita and distance occur for some sectors but not for all.

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[10] It should be noted that the USITC database covers less countries than TRAINS. In particular, the former includes no data on Cote D'Ivoire, Senegal, Peru, Sri Lanka, Bahrain, Jordan, or Saudi Arabia. However, it does include Israel and Azerbaijan for which TRAINS has no recent data. Given the regional groups defined in appendix 1, this means the region most influenced by coverage is the Middle East/Turkey.

[11] 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 $\boldsymbol{P}_r = \boldsymbol{P}_w(1+\mu)(1+\tau)(1+\delta)(1+\rho)$, where μ, τ, δ, and ρ are the percentage markups due to distribution costs, tariffs, transport costs and the NTM, respectively. Taking logs of both sides yields: $\ln P_r = \ln P_w + \ln\tilde{\mu} + \ln\tilde{\tau} + \ln\tilde{\delta} + \ln\tilde{\rho}$, where ~ indicates one plus the variable.

As shown by Halvorson and Palmquist (1980), the coefficients on the NTM dummy variables in (6)′ may be transformed into the percentage markup in price (premium) 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.[12] 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.[13] Thus, the NTM price premia estimates in table 2 are constructed using the Kennedy transformation. Statistical significance is determined using standard errors calculated from the van Garderen and Shah approximate unbiased variance estimator.

Table 2 reports NTM price premia only for regions and products in which the estimates were positive and statistically significant at the 10 percent level or better. For the most part, these price premia are direct estimates. However, in some cases, a country/region had NTMs on all products in a given sector. In those cases, the NTM dummy was collinear with the region's fixed effect dummy. Thus the estimated regional fixed effect would include both region-specific factors (not accounted for by other variables) which lead to generally higher or lower prices and the impact of the NTM. There are only a few collinear cases where the region-specific effects were positive and statistically significant. However, in these cases we have no good way of separating out the impact of the NTM. For a given product, we chose to compare the collinear region's fixed effect estimate with an average of the regional fixed effect estimates (exclusive of the collinear cases). If the collinear region showed a premium above the average regional effect, we reported that premium as the impact of the NTM. These cells are shaded grey.

The NTM premia in table 2 should be viewed as estimates of the percentage premium on products

[12] 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.

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

restricted by an NTM in a country in that region, relative to the price of those products in countries without NTMs. Not surprisingly, the sector with the largest number of significant NTMs is Apparel. Here, we see six regions reported as having significantly higher prices due to the presence of NTMs. For the United States, the EU and Canada, prices are 15, 66, and 25 percent higher, respectively, due to these barriers. The Canadian, and United States NTM premia estimates are plausible, when compared to those in previous literature, while the EU NTM premium estimate may be too high.[14] Oddly, Japan is reported to have 190 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 (e.g., Yang, 1994). Since all four of these countries/regions have NTMs on all apparel products, the NTM dummy is collinear with region-specific effects. Thus, these anomalies may be the result of the somewhat crude method of isolating the impact of the NTMs from other region-specific characteristics.

Other sectors with multiple significant NTMs are paper products, leather products (shoes), and vegetable oils and fats. In SE Asia, South Asia, and Japan, paper products are 67, 119 and 199 percent more expensive, respectively due to NTMs. NTMs on shoes raise prices in Japan (39%), Mexico/Central America (80%), and Mercosur(112%), while NTMs on vegetable oils and fats raise their prices in Zimbabwe/S. Africa (90%), Mexico/Central America (30%), and SE Asia (49%).

Although both databases indicated many NTMs in several agricultural sectors, and in beverages and tobacco (see table 1), there are almost no significant NTM premia estimates for these sectors in table 2. One explanation for this may be the definitions of NTMs used. Although many countries have "prior authorizations" to import agricultural products, the binding constraints on this trade are more likely to be tariff-rate quotas. While prior authorizations are included in the definitions of NTMs here, TRQs are not. For other sectors, the products included in the EIU CityData may not be representative of the more aggregated products shown in table 1. For example, the only two products representing Electronic

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

Equipment are 66cm color televisions and 64 MB personal computers. To the extent that these products do not reflect the overall pricing of goods in HS 852812 and HS847141, they may not reflect the impact of the NTMs which are reported for those tariff lines in TRAINS (table 1).

7. Simulation – Methodology and Results

To the extent that they are designed to limit trade, NTMs create an artificial scarcity and an artificially high price. In general, the degree of restrictiveness of an NTM is measured by the price differential that it drives between the price of imported goods and the producer price of the domestic substitutes, or alternatively, between the domestic and the world price.[15] The "wedge" between the distorted and the non-distorted prices is the key input used in studying the potential economic effects of the removal of a given NTM.

In the previous section of the paper, we estimated new NTM price-wedges in a selected group of sectors for a number of economies or regional aggregates. In this section, we use those estimates (compiled in Table 1) to simulate the welfare impact of removing the identified NTMs.[16]

Analytical framework

To estimate the economic impact of removing the NTMs, we use the Global Trade Analysis Project (GTAP) framework which allows for the assessment and the decomposition of the welfare effects of various trade agreements.[17] GTAP has been widely used to study the likely effects of different trade agreements and other trade policy issues, it is readily available to the public and, the results reported in this paper can be easily replicated. [18]

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[15] Note that when foreign and domestic goods are not perfectly substitutes for each other, their price may diverge even in the absence of any trade restraints. The introduction of a NTM will further increase suchdivergence.

[16] The absence of an estimated wedge in Table 1 means one of three things: (a) the region had no NTMs on these products, (b) the policy data contained no information on NTMs, or (c) the policy data did contain such information, but the NTMs were not statistically associated with above-average prices given the characteristics of the economy in question. The caveats presented in the previous econometric sections should be borne in mind when looking at the simulation results.

[17] For additional information about the GTAP model and data, see Hertel and Tsigas (1997).

[18] Several analytical works conducted using GTAP can be accessed at http://www.gtap.agecon.purdue.edu/.

The GTAP modeling framework consists of a comparative static CGE model and a global database. The CGE model is based on commonly applied assumptions of constant returns to scale, perfect competition and product differentiation by economy of origin (i.e., the Armington assumption). The database contains information on international and domestic markets and primary factors, as well as tariffs and other taxes. An additional component of the data is the set of parameters which, in the context of the model=s equations, determines responses to changes in relative prices, among other things. The latest version of the standard GTAP database (base year 1997) is used to study the likely effects of removing the estimated price wedges.

The welfare impact of the removal of the studied NTMs is measured using the money metric equivalent variation (EV), which can be broken down into component parts in order to enable us to decompose the liberalization. The equivalent variation measures the welfare impact of a policy change in monetary terms and it is defined as the amount of income that would have to be given to (or taken away from) the economy before the policy change to leave the economy as well off as the economy would be after the policy change. A positive figure for equivalent variation implies that the policy change would improve economic welfare.[19] The equivalent variation of a policy change consists mainly of two components: allocative efficiency and terms-of-trade. Allocative efficiency contributions arise when the allocation of productive resources changes relative to pre-existing policies; terms-of-trade contributions arise from changes in the prices received from an economy's exports relative to the prices paid for its imports.[20]

Because NTMs create a wedge between the world price and the domestic one, the most straightforward way to model them is as a "tariff equivalent" above and beyond the actual tariffs. This is generally appropriate, especially when the studied policy is implemented to directly affect the domestic price of the imported good.[21] In this paper, we implement the estimated price wedges as tariff equivalents.

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[19] For more on the concept, see Varian (1999, pp. 252-253).

[20] The standard GTAP simulations conducted here represent only the static impacts of a policy change, while dynamic effects due to increased investment, increased competition, and economies of scale might be important. It should also be pointed out that, under one of the central assumptions of the GTAP model, each region has large enough market power to be able to affect world price by changing its policies.

[21] For this type of policy, economic rents that results from the higher import prices are captured by the importing economy. From the viewpoint of the liberalizing country, the NTM removal is in this case expected to deteriorate

Simulation design and results

Two types of simulations are conducted—region specific and sector specific. The first set of estimates, presented Table 3, considers cases in which each of the regions of the model, operating as a single economy, liberalizes trade unilaterally. The second set of estimates, presented in Table 4, are in the nature of sectoral liberalization initiatives – it is assumed that all NTMs in a given sector are abolished worldwide on an MFN or "open regionalism" basis. While these two sets of simulations are not directly comparable either to each other or to a simultaneous global liberalization of all NTMs under consideration, they give approximately similar results. Global welfare gains from removing the category of NTMs under consideration are on the order of $90 - $92 billion whether summed across either the regional or the sectoral simulations. It should be borne in mind that these estimates leave out any potential gains from liberalizing measures not under consideration, such as as standards and SPS-related policies, investment restrictions, policies pertaining to services, etc.

The first set of experiment reflects country/region specific unilateral NTM removal, holding other countries' policies as given. The results are presented in Table 3. In general, the liberalizing economy experiences substantial welfare gains following trade liberalization. This suggests that the positive allocative efficiency impact of liberalization far outweighs any adverse terms of trade impact. The EU and Japan are among the biggest gainers from their own liberalization gaining as much as $22 billion and $31 billion respectively. Largest global gains from NTM liberalization would also come from liberalization by those two economies.

The results of liberalization by global sector-specific initiative are considered in Table 4. This method of presenting the results not only allows a computational savings, it can be considered to be in the broader tradition of APEC initiatives. The Information Technology Agreement, which was a sectoral tariff initiative, began through discussions in APEC which were generalized to the WTO, and the APEC Automotive Dialogue and Chemicals Dialogue can be considered as examples of sectoral initiatives which cover a wide variety of topics. The simulation results suggest that the removal of the identified apparel NTMs would lead to the largest global welfare gains (as much as $64 billion). Liberalization of

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the terms of trade (i.e., pre-tariff prices of the imported good increase as demand for it increases) but to improve resource allocation.

in the machinery and equipment; the leather and footwear; , and the paper product and publishing sectors also produce substantial global gains, increasing welfare by $11.7, $4.6 and $5.5 billion respectively.

8. Conclusions, Caveats and Extensions

The preliminary results shown for 18 regions and fourteen sectors suggest that the econometric approach presented here may yield useful estimates of the tariff-equivalents of NTMs. While these results are encouraging, there are a number of caveats, and further work needs to be done. Many observations are still lost due to specific or compound tariffs that are not readily transformed into *ad valorem* equivalents. Updating tariff information, and using the WITS AVEs where they are available should improve the overall accuracy of the regressions as well as the estimated impact of the tariffs on retail prices. While the pooling of like products within a sector solves several problems, it also introduces an additional source of variation in prices which may not be adequately addressed with product dummies. Allowing the impact of all retail markup proxies, as well as the tariff, to vary across products within a sector may capture some of this variation and allow a sharper estimate of the NTM impacts. Finally, while the present method of handling cases where the NTM dummy and regional fixed effect are collinear may adjust for products with higher than average markups, it is not clear that the method adequately accounts for regions with relatively higher than average costs of living. A more refined method which accounts for both should yield better TE estimates in some critical sectors.

With respect to the simulation results, it should be noted that the "one-size-fits-all" approach of modeling all NTMs as tariff equivalents abstracts from a number of considerations of how policies are in fact implemented, and was adopted here for the sake of expediency only. In earlier work (Andriamananjara, Ferrantino, and Tsigas (2003)), we explored the implications of modeling different NTMs as tariff equivalents, export tax equivalents, or "sand in the wheels" depending on how the associated policies are implemented. This point is particularly familiar to those familiar with apparel policies such as the Agreement on Textiles and Clothing.

With respect to the work as a whole, it is important to recognize that only a specific range of the universe of NTMs are analyzed here, implying that the welfare results may well be lower bounds. In particular, we have not yet exploited the full richness of the Manifold-Donnelly policy database with respect to standards, sanitary and phytosantiary standards, investment-related policies, and other potential NTMs. The reader may come away from the present apparel-heavy estimates with the impression that the onset of the post-ATC era may mean a substantial easing of the distortions caused by NTMs. We hope in future work to analyze these broader sets of policies, which should contribute to alleviating any such impression.

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TABLE 1. Catalogue of NTMs.[1,2]

REGION	GTAP SECTOR: Vegs., fruit, nuts	Bovine meat prods.	Meat prods. nec	Veg. oils and fats	Dairy prods.	Food prods. nec	Bevs., and tobacco prods.	Wearing apparel	Leather products	Paper prods., publg.	Chemical, rubber, plastic products	Metal prods.	Electr. equip't.	Mach. and equip't. nec
Zimb/ S. Africa	T	T	T,U	T	T	T,U	T,U	T			T			
Rest of SSA		T,U	T,U	T,U	T	T	T,U			T	T,U			T
AUS/NZ	T	T	T	T	T	T	T		T		T	T	T	T
EU	T,U	T,U	T	T,U	T,U	T,U	T,U	T,U	T		T		T	
FSU/EE	T,U	T	T	T	T	T	T,U	U	T,U		T,U			T
Rest of LA	T,U	T	T,U	T,U	T,U	T,U	T,U	U		T	T			
MERC	T	T	T	T	T	T,U	T,U	T,U	T,U		T,U	T	T	T
Mexico/CA	T,U	T,U	T,U	T	T,U	T	T,U	U	U	T	T,U		T,U	T
SE Asia	T,U	T,U	T,U	T,U	T	T,U	T,U	U		T	T,U		T	
South Asia	T	T,U	T	T	T	T	T,U	T	T	T	T,U	T,U	T	T
East Asia	T,U	T,U	T	T	T	T	T,U	T	T	U	T,U		T	
China		U	U	U			T,U				T	U	T	
Canada	T,U	T	T	T	T	T		T,U						T
Japan	U					T		U	U	U	U			
ME/ TKY[2]	U	T,U	T,U			U	T,U	T,U	T,U	T	T,U	T	T	T
N. Africa	T	T	T	T	T	T	T		T	T	T,U	T	T	T
EFTA	T,U	T,U	T,U	T	T,U	T	T		T		T			T
US	T	T	T		T	T	T,U	T,U	T,U		T	T	T	T

[1] T indicates the presence of a QR according to the TRAINS database, in at least one country and one product in the region. These QRs include any Control Measures (designated as 6100-6900) in the TRAINS database. U indicates the presence of a QR according to the USTIC database, in at least one country and one product in the region. These QRs include any import restriction, import quota or prohibition, import license, import surcharges or customs measures considered to be impediments to trade found in the USITC NTM Database.

[2] A U in this region indicates the presence of a barrier in either Turkey or Israel, since the USITC database does not cover any of the other countries in this region. See footn ote 10 in the text and appendix 1.

TABLE 2. Estimates of the Impact of NTMs on Prices.

	GTAP SECTOR													
REGION	**Vegs., fruit, nuts**	**Bovine meat prods.**	**Meat prods. nec**	**Veg. oils and fats**	**Dairy prods.**	**Food prods. nec**	**Bevs., and tobacco prods.**	**Wearing apparel**	**Leather products**	**Paper prods., publg.**	**Chemical, rubber, plastic products**	**Metal prods.**	**Electr. equip't.**	**Mach. and equip't. nec**
Zimb/ S. Africa				90										
Rest of SSA						56								
AUS/NZ												45		
EU								66[2]					15	
FSU/EE								37						
Rest of LA														
MERC									112					
Mexico/CA				30			25	101	80		36			
SE Asia				49						67				
South Asia										119				
East Asia			29											
China		191[2]												
Canada								25[2]						
Japan								190[2]	39[2]	199				
ME/ TKY		19											22	38
N. Africa														
EFTA														
US								16[2]						

[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 NTM dummy for this region is collinear with the regional fixed effect. This estimate is calculated as the difference between this region's fixed effect coefficient and the average regional fixed effect for this sector (exclusive of the collinear cases).

Table 3. Welfare impact of region specific liberalization

	Impact on region																	
	SSA	AUNZ	EU15	RussiaEE	RSAm	MERCOSUR	MECAC	SEAsia	SoAsia	EaAsia	China	Canada	Japan	MENA	EFTA	USA	ROW	Total
Liberalizing region																		
SSA	843	2	232	-3	10	50	-6	28	13	-4	-1	-4	26	-6	14	63	-1	1,253
AUNZ	0	195	51	-4	-1	-3	-2	15	7	55	24	0	43	-3	2	7	2	390
EU15	150	-46	22,710	2,176	43	-460	-102	848	1,087	679	1,378	-99	-2,143	2,500	394	-852	426	28,691
RussiaEE	-8	-1	540	1,111	-1	-2	0	10	11	7	150	3	-15	134	4	-20	8	1,929
RSAm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MERCOSUR	-3	3	-9	-4	5	2,169	-1	17	-16	-11	8	10	-16	-12	2	82	-4	2,220
MECAC	-9	-10	85	-20	102	48	4,132	10	-21	-4	26	-81	-182	-51	10	1,506	-4	5,536
SEAsia	10	20	62	0	-3	71	0	487	72	146	43	8	68	30	2	74	4	1,093
SoAsia	7	1	55	9	0	-2	-3	10	480	21	-4	8	0	10	1	17	0	611
EaAsia	1	0	18	0	0	6	0	6	0	37	12	4	5	-4	-1	18	0	101
China	6	21	0	11	4	-14	-1	-29	-11	-6	201	10	29	10	4	144	-1	377
Canada	-2	0	0	4	0	0	1	44	81	59	125	292	-9	12	0	34	7	648
Japan	-5	22	595	-40	45	37	94	1,033	106	809	3,679	146	31,044	-71	-14	108	69	37,657
MENA	-75	-42	604	-195	-23	-394	-108	197	-47	376	187	-4	-705	7,307	14	434	-53	7,471
EFTA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USA	23	36	172	78	118	55	606	633	692	695	757	117	-2	304	18	-105	142	4,339

Source: Simulations by authors using GTAP

Table 4. Welfare impact of sector specific liberalization

	Impact on region																	
	SSA	AUNZ	EU15	RussiaEE	RSAm	MERCOSUR	MECAC	SEAsia	SoAsia	EaAsia	China	Canada	Japan	MENA	EFTA	USA	ROW	Total
Liberalized Sector																		
Vegetables, fruit, nuts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Animal products nec	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fishing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bovine meat products	-1	10	-4	-2	-1	10	-1	-2	1	0	-3	-1	1	220	0	9	-1	236
Meat products nec	-4	55	679	7	0	-11	-4	146	21	37	-6	59	809	376	0	695		
Vegetable oils and fats	355	0	58	0	-8	124	91	150	62	19	11	-3	25	13	0	53	2	953
Dairy products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Processed rice	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sugar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Processed food products	503	2	180	-3	12	12	-5	8	10	-4	0	-3	24	-1	14	51	-1	800
Beverages and tobacco products	-1	0	72	-1	13	3	97	-2	-1	-3	-1	-2	-4	-4	-1	58	-1	222
Wearing apparel	150	74	15,567	3,048	213	43	3,213	2,172	1,962	1,776	5,269	340	26,334	2,924	151	132	673	64,040
Leather and footwear products	-4	3	142	1	18	2,215	822	117	-10	84	297	-3	717	-11	2	259	-1	4,649
Paper products, publishing	15	38	27	-23	16	21	-11	480	541	282	125	221	3,485	-48	3	399	0	5,570
Petroleum, coal products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chemical, rubber, plastic products	-3	-4	-4	-11	70	26	728	4	-2	21	-8	-34	-108	-24	11	388	-1	1,050
Metal products	0	195	51	-4	-1	-3	-2	15	7	55	24	0	43	-3	2	7	2	390
Motor vehicles and parts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electronic equipment	-29	-17	1,260	-62	-27	-96	-61	131	95	360	11	17	71	-118	-16	865	-8	2,375
Machinery and equipment nec	-37	-134	7,546	292	-20	-783	-179	210	-180	206	356	-154	-2,578	7,983	258	-967	-59	11,760

Source: Simulations by authors using GTAP

APPENDIX 1. 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.

APPENDIX 2. EIU CityData Product/GTAP Sector/HS Concordances

GTAP	EIU CityData Product	HS
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	EIU CityData Product	HS
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	EIU CityData Product	HS
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	EIU CityData Product	HS
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