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Moving Forward Faster:

Trade Facilitation Reform and Mexican Competitiveness

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Abstract

Improved competitiveness is at the top of the agenda for Mexico as it moves to leverage economic progress made over the past decade. This paper evaluates the impact of changes in trade facilitation measures on trade for main industrial sectors in Mexico. Four indicators of trade facilitation are used: Port Efficiency, Customs Environment, Regulatory Environment, and e-commerce use by business (as a proxy for Service Sector Infrastructure).

We use the gravity model results to consider how much trade among countries might be increased under various scenarios of improved trade facilitation. Our goal is to inform directions for specific trade facilitation initiatives with the highest potential to increase trade. We examine scenarios that focus on improvements in Port Efficiency, Customs Environment, Service Sector Infrastructure, and Regulatory Environment. We follow a simulation strategy that uses a formula to design a unique program of reform for each country in the sample, and apply it to the specific case of Mexico. The formula brings *below-average* countries in the group *half-way* to the average for the entire set of countries. We focus on the *below-average* country on the grounds that donor attention and capacity building efforts should be extended to this group. We choose an improvement of *half-way* to the average because there are limited development resources and improvements take time.

After simulating these improvements in trade facilitation in all four areas, we find that the total increase in trade flow in manufacturing goods is estimated to be $348.2 billion (about 7.4% of total world trade).

The analysis in this paper indicates that Mexico has a large scope for trade promotion from trade facilitation reform: overall increments *from domestic reforms* are expected to be on the order of $31.8 billion, equivalent to 22.4% of total Mexican manufacturing exports for 2000-2003. On the imports side, these figures are $17.1 billion and 11.2%, respectively. In total exports as well as in Textiles, increases in exports result from improvements in Port Efficiency and the Regulatory Environment (i.e., the perception of corruption). In turn, exports of Transport Equipment are expected to get a greater increment from improvements in Port Efficiency, whereas exports of Food and Machinery seem to be more related to improvements in the Regulatory Environment. On the imports side, Mexican improvements in Port Efficiency appear to be the most important factor, although for imports of Transport Equipment improvements in Service Sector Infrastructure are also of relative importance.

Our results show that unilateral trade facilitation reforms for the case of Mexico could generate an increment of more than 20% for exports as well as about 11% for imports. These estimates suggest that trade facilitation measures should be considered seriously in any discussion about trade policy in Mexico.

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1. Introduction

In the two decades up to 2001, world trade has grown twice as fast as world output (6 vs. 3 percent) (IMF, 2001). This phenomenon was particularly important for the case of Mexico: while non-fuel exports grew from 10 billion US dollars of 2002-equivalent in the early 1980s to more than 130 billion US dollars of 2002-equivalent with an annual growth rate of 14%, the share of non-fuel exports in GDP grew from about 4% to 35% in the same period. Besides the increasing overall international demand, this extraordinary expansion in Mexico's international trade has its roots in reforms undertaken in the mid to late 1980s and to some extent in the signing of several free trade agreements, in particular the one of 1994 with Canada and the United States. By 2001, world economic growth slowed down.

This fact, coupled with the terrorists attack on the U.S. on 9/11, impacted negatively on the rate of growth of international trade. In the case of Mexico with the US as its largest market, tthis new environment translated into a considerable decrease in export growth during 2002 and 2003 (about 2% per annum) with a recovery only in 2004 and 2005 (about 12% per annum). In spite of this recovery, the dynamism showed by China's exports, among other factors, displaced Mexico as the second supplier to the U.S. market.

The Mexican government has been aware of the new challenges posed by changes in the international economy even before 9/11. The National Development Plan 2001-2006 states that improvements in the country's international competitiveness were a necessary condition to achieve more dynamic growth. Two of the strategies stated in that document that were closely related to international trade were: i) to increase the insertion of Mexico into the "new" international economy, and ii) to reduce administrative costs for firms through better regulations.[4]

These issues are aligned with new developments in international trade policies. By the 1990s many countries reduced their tariff and non-tariff barriers to trade as a consequence of adopting a development strategy that emphasized integration with the global economy (Clark et al, 2001). This reduction in artificial trade barriers has raised the importance of remaining issues, such as high transport costs (i.e., shipping costs between countries), as well as the environment

[4] A recent document by the *Secretaria de Economia* makes an excellent description of the measures taken since 2000 and on their likely impact. See, "Acciones concretas para incrementar la competitividad", 2004, by the Mexican Subsecretaria de Industria y Comercio.

in which trade transactions take place. This includes regulatory transparency and professionalism of customs, harmonization of standards, and use of information technology in trade, for example. All these factors relate to 'trade facilitation' and politicians as well as researchers are shifting the focus of trade facilitation efforts inside the border to domestic policies and institutional structures where capacity building can play an important role.[5]

An increasingly important policy question in trade centers on estimating the impact on trade of capacity building projects and relative impact of differing policy reform agendas on competitiveness. Wilson, Mann, and Otsuki (WMO) (2004) find that enhanced capacity in global trade facilitation would increase world trade of manufacturing goods by approximately $377 billion dollars – an increase of about 9.7 percent. This is based on a scenario in which capacity building is raised half-way to the global average across 75 countries. The authors specifically examine four areas: Port Efficiency, Customs Environment, Regulatory Environment (which includes standards), and Information Infrastructure. They find that the improvement in Port Efficiency results in about $106.9 billion (equivalent to 2.8% of total world trade) increase in trade, whereas improvements in Customs Environment results in about $32.9 billion (0.8 percent) increase in trade. The increase in trade from the improvement in the Regulatory Environment is estimated in about $83.3 billion (2.1% of total world trade). The largest trade increase comes from improvements in services sector infrastructure and e-business usage ($154 billion, 4.0 percent of total trade). WMO (2004) also find that the increments in trade from export improvement in trade facilitation more than double those coming from the impact of imports on trade.

These results suggest, in general, that increased capacity to comply with GATT Article V (freedom of transit), Article VIII (fees and formalities connected with importation and exportation), and Article X (publication and administration of trade regulations) along with other reforms could raise global trade for all WTO members.

For the case of Mexico, WMO (2004) estimated that greater exports coming from improvements in all trade facilitation measures could be on the order of $17.3 billion. The aggregate nature of the WMO study does not provide for estimates of whether higher exports levels are equally spread among all industrial sectors or are concentrated in a few industry

[5] A good example of this is the Colloquium on Public Policy Innovations organized by IBERGOP-Mexico in 2004. A clear result from it is that something beyond lowering tariffs and pursuing Free Trade Agreements should be done by Mexico to face the challenges in the world markets. See IBERGOP,2004.

sectors. This is an important issue since political economy issues would certainly impact on the process to achieve the reforms needed to improve trade facilitation. Therefore, it is important to identify key sectors that would expand in a new trade facilitation environment.

A recent paper by Hanson and Robertson (2005) identifies changes in Mexico's sectoral exports and the component of these changes that can be attributed either to growth in Mexico's export-supply capacity or to growth in import demand in Mexico's trading partners. Their preliminary results show that Mexico had weak growth in its export- supply capabilities, even during the height of the 1990s boom. That is to say, exports could have grown even at a higher rate than the 14% real per annum since they were not constrained by import-demand conditions in the United States and other destination markets. Moreover, their paper points out that Mexico's sluggish export performance is ***not*** due to China's expansion in global markets. Thus, according to this paper, the ball is in the Mexican court.

The field of gravity model estimates is a vibrant one. As shown by recent papers, notably those by Anderson and van Wincoop (2003) and by Silva and Tenreyro (2006), previous estimates coming from gravity equations could present serious problems of bias and inconsistency of estimates. Thus, in this paper, we revisit and extend WMO (2004). We update the data and the modeling approach taking into account the new developments in the field, and also we extend the research to assess the potential impact that improvement in trade facilitation measures could have for exports and imports of key manufacturing sectors.

Although important by itself, the issue of mapping changes in global trade to changes in welfare measures is beyond the aim of this paper. Our scope here is limited to make an assessment of the expected change in trade after improvements in key trade facilitation measures are taken by countries that are below the world mean in these indicators. [6] As mentioned above, Mexico's international trade faces an increasingly competitive world with relative low tariff levels. The estimates in this paper, therefore, can help inform domestic debate on trade facilitation issues.

[6] Also, as indicated by an anonymous referee, if the increase in trade actually maps into increase welfare, there may be positive cross-country externalities coming from improvements in trade facilitation.

2. Overview of Previous Work

The empirical literature on trade facilitation is limited, as outlined in Wilson, Mann, and Otsuki (2003) (henceforth WMO, 2003). In the past, researcher used a single measure of trade facilitation to estimate its effect on trade, finding large gains from trade facilitation efforts. For instance a 3% reduction in landed costs applied to intra-APEC merchandise trade, as might be obtained by electronic documentation, reduces trade costs by US$60 billion (APEC, 2001). A 1 percent reduction in import prices for the industrial countries and the newly industrializing countries of the Republic of Korea, Chinese Taipei and Singapore, and a 2 percent reduction for the other developing countries yields an increase in APEC merchandise trade of 3.3 percent—meaning the elasticity of trade facilitation efforts to trade flows is greater than 1 (Economic Committee,1999). Considering global estimates, a 1 percent reduction in the cost of maritime and air transport services in the developing countries could increase global GDP some US$7 billion (1997 dollars).

If trade facilitation is considered in a broader sense to include an improvement in wholesale and retail trade services, an additional US$7 billion could be gained by a 1 percent improvement in the productivity of that sector (UNCTAD, 2001). Djankov, Freund, and Pham (2006) examine how time delays affect trade, using World Bank data from the Doing Business 2006 report on the days it takes to move standard cargo from the factory gate to the ship in 126 countries. The authors find that on average, each additional day that a product is delayed prior to being shipped reduces trade by at least 1 percent. Each day is equivalent to a country distancing itself from its trade partners by 85 km on average. Delays have an even greater impact on developing country exports and exports of time-sensitive goods, such as perishable agricultural products.

Other authors consider more specific categories of trade facilitation effort or a more limited country set. Hertel, Walmsley and Itakura (2001) find that greater standards harmonization for e-business and automating customs procedures between Japan and Singapore increase trade flows in overall between these countries as well as their trade flows with the rest of the world. Hummels (2001) finds that each day saved in shipping time in part due to a faster customs clearance is worth 0.5 percentage point reduction of ad-valorem tariff. Fink, Mattoo, and Neagu (2002a) examine the effect of anticompetitive practices in port services and other transport services on unit shipping cost. Fink, Mattoo, and Neagu (2002b) find that a 10 percent

decrease in the bilateral price of phone calls is associated with an 8 percent increase in bilateral trade. Moenius (2000) finds that bilaterally-shared and country-specific standards promote trade. Otsuki, Wilson, and Sewadeh (2001a, 2001b) find that 10 percent tighter food standards in the European Union would reduce African exports of certain cereals, nuts, and dried foods by a range of 5 to 11 percent, depending on the category.

WMO (2003) and WMO (2004) developed a new approach to estimate the effects of trade facilitation on trade flows by constructing four measures of trade facilitation, as well as the independent effects of these four on the trade flows among a broad group of countries in the Asia Pacific region and among 75 countries, respectively. In both papers, WMO used cross-country survey data on the business and policy climate to construct numerical measures of trade facilitation for each country for Port Efficiency, Customs Environment, Regulatory Environment and, e-business usage (a proxy for Service Sector Infrastructure importance for trade).

WMO (2003) find that the elasticity of increased Port Efficiency of importing countries is larger than the elasticity of improved Customs Environment or superior Service Sector Infrastructure. If unilaterally applied, more stringent Regulatory Environment will reduce a country's imports. In their simulations, they find that for the APEC economies as a group, improving Port Efficiency, Customs Environment and Service Sector Infrastructure measures of the below-APEC-average economies half-way up to the APEC average for each trade facilitation measure yields an increase in trade of some 20 percent. Although on average the Port Efficiency indicator is the most important for trade facilitation, since each country has a unique set of indicators and pattern of trade, more detailed analysis of the simulation results shows that for some members of APEC, a trade facilitation measure other than ports may be the best to target for capacity building to increase that economy's trade.

3. Analytic approach

The following sections draw on WMO (2004) and we reproduce only the key elements of the approach used by the authors. This paper applies an up to date gravity model approach to an updated data set. In contrast to WMO (2004) our approach presented here considers data for main industrial sectors in Mexico. Following WMO (2004), the definition of trade facilitation incorporates relatively concrete "border" elements, such as Port Efficiency and customs

administration, and "inside the border" elements, such as domestic Regulatory Environment and the infrastructure to enable e-business usage.

4. Data issues

4.1 Rationale for Selecting Trade Facilitation Indicators

We use four distinct areas of focus that meet policymakers' needs for specificity on how to approach trade facilitation efforts. They are: (1) Port Efficiency, (2) Customs Environment, (3) own Regulatory Environment, and (4) Service Sector Infrastructure. Port efficiency is designed to measure the quality of infrastructure of maritime and air ports. Customs environment is designed to measure direct customs costs as well as administrative transparency of customs and border crossings. Regulatory environment is designed to measure the economy's approach to regulations. Service sector infrastructure is designed to measure the extent to which an economy has the necessary domestic infrastructure (such as telecommunications, financial intermediaries, and logistics firms) and is using networked information to improve efficiency and to transform activities to enhance economic activity. Besides the observation that these categories match areas for policy-makers attention, these trade facilitation measures also match several GATT articles and appear in the list of Singapore issues in the Doha Development Agenda. Therefore, they have salience for WTO negotiations.

4.2 Constructing the Measures Used in This Study

We use data from WMO (2003) that rely on three sources--World Economic Forum Global Competitiveness Report 2001-2002 (henceforth GCR), IMD Lausanne, World Competitiveness Yearbook 2002 (henceforth WCY), and Kaufmann, Kraay and Zoido-Lobaton (henceforth KKZ). See the Data Appendix for a more complete description of the sources and each of their methodologies for collecting and preparing data about a country.

Table 1 reports information about these indicators. It displays each input for the trade facilitation indicator, the mean, standard deviation, and minimum value along with countries of best and worst practice. For best practice, Singapore and Finland stand out. As the focus of this paper is the likely impact of changes in trade facilitation measures on Mexico's trade, the last four columns of Table 1 display the absolute numbers for Mexico, as well as its ratio from the minimum and maximum values. It can be seen that only in two variables Mexico is an average

country (Hidden Imports Barriers and Transparency of Government Policies, whose ratios to the mean are about 1). In all other counts, Mexico is well below the mean. For instance, in Port Facilities Mexico's level of 0.478 is 25% below the average of 0.636 for the countries in the sample. These facts suggest that there is wide room for improvement in key domestic variables that are linked to international trade.

4.2 Trade Flows and Other Variables

We use bilateral trade flow data available at the Commodity and Trade Database (COMTRADE) of the United Nations Statistics Division, for 2000, 2001, 2002 and 2003. In contrast to WMO(2004) that uses yearly data for 2000 and 2001, to avoid our results be driven by particular years in what follows we use as dependent variable the average trade level for the four years.[7] We focus our attention on trade in manufactured goods, defined as commodities in categories 5 to 8 in SITC 1 digit industry except those in category 68 (non-ferrous metals). As indicated above, we extend what was done in WMO (2004) by using data for 4 main industrial sectors: Food Beverages and Tobacco, Textiles, Machinery except Transport Equipment, and Transport Equipment. World trade of these sectors is about 64% of total trade. For Mexico, these sectors represent 79% of non-fuel exports and 65% of imports, respectively.

Tariff data were derived from the Trade Analysis and Information System (TRAINS) of the United Nations Conference on Trade and Development (UNCTAD). We use the weighted average of applied tariff rates for the manufactured goods in 2002 where bilateral trade values corresponding to each tariff line are used as the weights. The data on gross domestic product (GDP) and *per capita* GDP were derived for years 2000-2003 from the World Development Indicators published by the World Bank. All nominal figures were converted to constant US$ of 2002 using as deflator the US Wholesale Price Index.

5. The Gravity Model

The standard gravity formulation includes various measures of market size (GDP), similarity of demands (GDP per capita), measures of remoteness (distance and adjacency), and measures of kinship (regional trade arrangements, and language/ethnic similarities). To this basic formulation, we add tariffs as well as the trade facilitation indicators and some additional factors,

[7] For a rationale of doing this, see Soloaga and Winters (2000).

as described further below. After many *ad hoc* applications since the late 60's, the theoretical validity of the gravity model formulation has been revisited recently by many authors. A relevant recent one is that of Anderson and van Wincoop (2003), who derived a theoretical expression of the model that is similar to the one they actually estimated (previously there was a miss-match between the theoretical and the empirical models). In one version, their approach is implemented by allowing country specific fixed effects that would capture an idiosyncratic trade resistance term. In was follows we are not using this approach since many key variables we used in our model do not change by country (e.g., Port Efficiency). In a further version of this paper we will explore how to implement Anderson and Van Wincoop´s approach with our data setting. As mentioned above, a new paper by Silva and Tenreyro (2006) (S&T from now on) shocked the field of gravity estimates by showing that under the presence of heteroskedasticity, the parameters of log-linearized models--as the ones used in gravity estimates—estimated by OLS lead to biases estimates of the true elasticities. Since estimated elasticities are at the core of our paper, we have re-estimated a previous OLS-based version of the paper and applied in what follows this new S&T approach.[8]

5.1 The Econometric Model and Results

Following S&T gravity modeling approach, the basic structure of our specific gravity equation is the following:

$$\begin{aligned}\ln Vji = {} & \beta_o + \beta_1 \ln(1 + Tariff_{ji}/100) + \beta_2 \ln PE_j + \beta_3 \ln RE_j + \beta_4 \ln CE_j + \beta_5 \ln SI_j \\ & + \beta_6 \ln PE_i + \beta_7 \ln RE_i + \beta_8 \ln CE_i + \beta_9 \ln SI_i \\ & + \beta_{10} \ln GNP_j + \beta_{11} \ln GNP_i + \beta_{12} \ln GNPcapita_j + \beta_{13} \ln GNPcapita_i + \beta_{14} \ln DIST_{ij} + \beta_{14} Adjac_{ij} \\ & + \beta_{16} D_{ASEAN} + \beta_{17} D_{NAFTA} + \beta_{18} D_{LAIA} + \beta_{19} D_{AUNZ} + \beta_{20} D_{MERCOSUR} + \beta_{21} D_{EUn} \\ & + \beta_{22} D_{RNH} + \beta_{23} D_{FRC} + \beta_{24} D_{SPN} + \beta_{25} D_{ARB} + \beta_{26} D_{GMN} + \beta_{27} D_{POR} + \beta_{28} D_{RUS} + \ln(\varepsilon_{ij}) \qquad (1)\end{aligned}$$

Subscripts *i* and *j* stand for the importer and exporter respectively. Parameter β's are coefficients; the term ε_{ji} is the error term, assumed to be normally distributed with mean zero. The value of manufactures exports from country *j* to *i* is denoted as V_{ji} . The term $Tariff_{ji}$ denotes applied trade-weighted tariff rate in the percent *ad- valorem* term that is specific to the trading partners *i*

[8] For results coming from the conventional approach, see also Soloaga and Winters (2000). Results from the Anderson and Van Wincoop approach are presented in Corinne (2005) and also in Montenegro and Soloaga (2005).

and j . The terms PE_j, RE_j, CE_j and SI_j denote exporting country j's indicators of Port Efficiency, Regulatory Environment, custom efficiency, and Service Sector Infrastructure.

Similarly, PE_i, RE_i, CE_i and SI_i stand for the same trade facilitation measures in the importing country.[9] This formulation takes explicit account of the fact that country *j'* s exports (as well as its imports) will improve through its own trade facilitation efforts. The term GDP denotes gross domestic product and *GDPPC* denotes per capita GDP, where both are expressed in 2002 US dollar terms. Geographical distance between capital cities *i* and *j* is denoted as *DISTji.* . Dummy variables are included to capture the effect of preferential trade arrangements, language similarity and adjacency. The trade arrangements dummies include NAFTA *(D_{NAFTA})*, ASEAN *(D_{ASEAN})*, LAIA *(D_{DLAIA})*, AUNZ *(D_{AUNZ}), MERCOSUR ($D_{MERCOSUR}$)* and EU *(D_{EU}).* The language dummies include English *(D_{ENG})*, French (D_{FRC}), Spanish (D_{SPN}), Arabic (D_{ARB}), Chinese *(D_{CHN})*, German (D_{GMN}), Portuguese *(D_{DPOR})* and Russian *(D_{RUS})*. The adjacency dummy $Adjac_{ij}$ takes the value of one if country *i* is adjacent to country *j* and zero otherwise. To check for heterogeneity on the impacts across countries, we have run the above equation (1) allowing differences between developed and developing countries. We did this by interacting all variables for importers as well as for exporters with a dummy that equals one for OECD countries (excluding Mexico and Turkey)[10]. Following S&P we assume that the error term ε_{ij} follows a log-normal distribution with $E(\varepsilon_{ij} / independent\ variables) = 1$ and variance $\sigma_{ij}^2 = f(independent\ variables)$. Because of this, and also taking into account that some trade flows in a particular year could be zero, the model was estimated with STATA as a negative binomial equation (i.e., a *poisson* regression with over dispersion). Interested readers should consult Silva and Tenreyro's 2006 paper for details.

Table 2 presents descriptive statistics of trade variables. It can be seen that Mexico's share in world's industrial exports is 3% overall and between 2.7% (Food, Beverages and Tobacco) and 4% (Vehicles and Machinery) for the sectors considered in this paper. As for imports, overall Mexican share is about 3% also. Imports of Food, Beverages and Tobacco

[9] In contrast to WMO (2004), that included CE only for importing countries, here we will "let the data tell" whether CE is only important for the importing countries. It turned out that for some specifications, CE was statistically significant for both.

[10] We thank an anonymous referee that pointed this out to us. It turned out that effects were indeed different for developing and developed countries.

represent about 1.6% of world's total imports, whereas Textiles and Vehicles imports are about 2.6% of global imports and imports of Machinery represent about 3.8% of world's imports. The potential endogeneity of right hand side variables are discussed in detail in WMO (2004). Here we just need to mention that our estimations can only be improved when panel data with a sufficiently long time series in trade facilitation variables become available, which would allow direct attention to endogeneity.

5.2 Regression Results

The approach used here, which constructs a set of distinct trade facilitation indicators and deploys them in a gravity model of trade, is generally successful. Table 3 displays regression results for aggregate manufacturing exports, as well as for Food, Beverage and Tobacco, Textiles, Machinery, and Vehicles for the key variables in the model specified in Equation (1)[11]. The model was run using a negative binomial approach (i.e., a poisson regression approach that allows for over dispersion of the data), robust to heteroskedasticity. For aggregate average 2000-2003 manufacturing exports, the coefficients for the four trade facilitation measures are in general statistically significant. Moreover, save for the coefficient for Custom Environment of importers that turned out to be of negative sign, when statistically significant they have the expected sign and the estimated coefficients differ for the different trade facilitation indicators. From a policy perspective, these differences in estimated elasticities of trade flows with respect to trade facilitation indicator implies that different approaches to trade facilitation will differentially affect trade of individual countries as well as that of all countries in the sample as a whole. Although some coefficients are different, the estimates are generally in line with previous results from WMO (2004). The first four columns show different specifications of the gravity model for aggregate trade, basically checking possible effects of the high collinearity of the Trade Facilitation variables with tariff levels.

Following the first column of Table 3, we can see that higher tariffs have a significant and the expected negative effect (with a –0.921 elasticity) on trade. As mentioned before, high levels of tariffs are strongly correlated with the trade facilitation measures we are using in the

[11] The full set of results is presented in Annex I. Here it is worth to mention that most of the results are in line with the expected size and statistical significance. For instance, the coefficients for GDP of exporters and importers are significant and about 1 (for exporters) and 0,8 (for importers). The coefficient for the log of distance turned out to be about 1.05, whereas that for the dummy indicating adjacency of countries was about 0.6.

regression. To check whether this high correlation are blurring the individual impact of each variable, we run the same gravity regression without controlling for tariffs (column *b* in Table 3), without variables for exporters' trade facilitation (column *c* in Table 3) and without variables for importers' trade facilitation (column *d* in Table 3). It can be seen that main estimates are fairly similar along the four formulations.

Thus, figures following column (a) are useful benchmarks against which to compare the impact on trade of changes in trade facilitation indicators. Port Efficiency of both the importer and the exporter is positively associated with trade. That is, an improvement in the indicator toward best practice is associated with an increase in trade flows. Unlike results from WMO (2004) where global trade flows get a bigger boost when the exporters' Port Efficiency improves, our results imply a higher impact of an improvement in Port Efficiency of importers. The differences could be due to the change in the estimation approach as well as in the period covered.[12] So, for countries and regions that are well below the global best practice, such as Bolivia and Slovak Republic (see Table 1) there is great potential for improvement in terms of Port Efficiency.

This is the case also for Mexico whose Port Efficiency indicators as measured here are 13% below the average of the sample (level of .582 versus the average of 0.673). The Regulatory Environment, captured here by a single variable (control of corruption from the KKZ data set), turned out to be only statistically significant for the exporter (an elasticity of 1.191). This result is in line with WMO (2004) who find a bigger impact of exporters' Regulatory Environment, statistically significant at the 1% level, whereas that of the importers' had lower magnitude and was only significant at the 10% level. As mentioned above, we are letting the data tell whether we need to use measures of Customs Environment for importers and for exporters or, as in WMO (2004), only for importers.

When using this variable for both exporters and importers, it was found that only the Customs Environment of the exporter country has a significantly positive effect on exports with an elasticity of 0.676, whereas Customs Environment of importer turned out to be statistically

[12] We use two more years of data (2002 and 2003) and also estimate the gravity equations using the average 2000-2003 of trade and GDPs for the whole period. Besides the period covered and the poisson-equation approach (versus the OLS approach of WMO) there are two other differences with WMO: i) for Regulatory Environment we are using only data from KKZ for Control of Corruption, since data from WYC on Transparency of Government Policies were not available for all the countries in our sample, and ii) we are using Custom Environment measures for both importers and exporters and not only for importers.

significant and, surprisingly, of negative sign. This latter result turned out to be robust (in its sign as well as in its size) to different specifications of model (1) and should be further explored about why this is the case. At a more disaggregate level (see for instance in table 3 results for Food, Beverages and Tobacco and for Vehicles) this variable also showed a negative impact on trade. Improving indicators of Service Sector Infrastructure is positive and significantly associated with trade at the aggregate level among the studied countries: the coefficients for Service Sector Infrastructure are positive, statistically significant at the 10% level and of similar magnitudes (0.748 for the exporter and 0.628 for the importer, respectively).

Columns *e* to *h* in Table 3 shows results from running the gravity model considering as dependent variable only exports from the Food, Beverage and Tobacco industry (column e), Textiles (column f), Vehicles (column g) and Machinery excluding Vehicles (column h).

Results show that Port Efficiency has a positive impact on all sectors, although its quantitative importance varies from sector to sector. For instance, it seems that Port Efficiency in importing countries has a higher impact on food imports (elasticity of 1.986 versus elasticity of 0 for exporters). This is similar to the case of Machinery (elasticity of 1.345 for importers and of 0.904 for exporters), while for Textiles the importance of the impact is reversed: elasticity of 2.259 for exporters and of 1.351 for importers). The latter was also the case for Machinery exports: elasticity of 2.109 for exporters and 1.372 for importers). Results are also mixed for the variable that reflects the perception of corruption: the elasticity is 1.515 for exporters of food, 2.096 for exporters of textiles and a very high value of 5.774 for exporters of machinery. Surprisingly, this variable that reflects the Regulatory Environment turned out to be of negative sign for the case of importers of Vehicles. These negative results remained even after trying different specifications of the gravity equation for this sector[13].

Regarding Customs Environment, our results for aggregate industrial trade show a positive impact for exporters (elasticity of 0.676) and a negative impact on the exporters side (elasticity of –1.03). The positive impact on exporters at the aggregate level seems to be driven by the positive impact of this variable in Vehicles exports (elasticity of 3.55) and to a lesser extent by Textile exports (elasticity of 1.338). As for the negative impact on the importers side, results seem to be driven by negative elasticities in importers of food and of machinery (elasticities of -.815 and –0.698 respectively). Finally, we found that Service Sector

[13] This result was also robust in a previous version of this paper when we used an OLS approach.

Infrastructure was important for importers and for exporters, with a positive elasticity at the aggregate level of 0.748 and 0.628, respectively.

As a general conclusion for industrial exports, Trade Facilitation measures as defined in this paper matters, and matters even after controlling all the other variables that determine international trade. At the sector level, out of 32 possible impacts (32=4 sectors times 8 impacts), 16 coefficients had the expected (positive) sign and were statistically significant, 11 coefficients were non significant and 5 coefficients had an unexpected (negative) sign. In conclusion, our results clearly show avenues to be pursued in trade policy if the aim is to increase international trade. As mentioned above, we do not address in this paper whether increased trade is welfare increasing or not.

6. Changes in Trade from Trade Facilitation Reform: Simulation Results

Following WMO (2004), we use the gravity model results to consider how much trade among the 75 countries might be increased under various scenarios of improved trade facilitation. We will examine scenarios that focus on improvements in Port Efficiency, in Customs Environment, in Service Sector Infrastructure, and in Regulatory Environment. Our objective in the simulations is to help inform policymakers on which specific trade facilitation initiatives might have the greatest potential to increase trade. We follow the simulation strategy presented in WMO (2004), which uses a formula to design a unique program of reform for each country in the sample, and apply it to the specific case of Mexico. The formula brings the *below-average* countries in the group *half-way* to the average for the entire set of countries. We focus on the *below-average* country on the grounds that donor attention and capacity building efforts should be extended to this group. We choose an improvement of *half-way* to the average because there are limited development resources and improvements take time.

Dramatic improvements are possible, but it is not realistic to presume a scenario whereby all countries in the sample are assumed to achieve best practice as measured by the nation with the highest score on a particular measure of trade facilitation.[14] Since each economy has a specific value for each trade facilitation indicator, each country that is below-average on that indicator will improve by a different amount so as to get half-way to average. Our simulation

[14] Moreover, it is the case that in the course of the simulation, the 'average' target will rise, and we do not take account of this endogeneity. By restricting the improvement to half-way to average, we limit to some degree these second round effects.

approach acknowledges the differential potential for improvement revealed by Table 1. The countries for which we will simulate an improvement in trade facilitation will differ by the trade facilitation indicator. However, because trade facilitation links exporters and importers, all economies enjoy an increase in trade among each other even when only some have an improvement in their trade facilitation indicator.

Having the coefficients for both importer's and exporter's trade facilitation measures enables us to simulate the change in trade flow from different perspectives: for Mexico and others in the data set, as well. From the standpoint of a specific country, improvement, for example in Port Efficiency should increase both its own imports and exports. The same can be expected for Regulatory Environment, and Service Sector Infrastructure, as well as customs on the import side. But, a country will export more not only based on its own reforms, but also from reforms undertaken by its trading partners as importers. Thus export gains are the sum of the simulated effect on exports of unilateral reform and of import reforms undertaken by the country's trading partners. On the import side, a country's imports increase first on account of its unilateral import reforms, and secondarily on account of the reforms undertaken by its trading partners as exporters. Examining the relative gains to trade from unilateral reforms as compared to partner's reforms, and on exports vs. imports, and across trade facilitation indicators offers three dimensions of potential insight to policymakers, donors, and the private sector.

Table 4 summarizes the results for the simulations and presents the results for the 75 countries as a whole. In total, the collection of simulations on the four trade facilitation indicators yields an increase in trade among the 75 countries worth about $348 billion, representing an increase of about 7.4 percent in total trade among these countries. About $204 billion of the total gain (4.3 percentage points of total world trade in manufactures) comes from the improvement in Port Efficiency, about $78.3 billion (1.7 percentage points) from Regulatory Environment, and about $80 billion (1.7 percentage points) emanates from the improvement in Service Sector Infrastructure. As for improvements in Custom Environment, the positive impact of improvements on the exporters' side (about $ 56 billions) is more than compensated for losses

on the importers' side (-$69.6 billions), rendering a net loss of about $14 billions. This latter result is still a puzzle for us and deserves further attention.[15]

Tables 5 and 6 summarize respectively the change in exports and imports flow for Mexico. The first two columns in Table 5 shows that Mexico's unilateral improvements in trade facilitation measures are expected to increase manufacturing exports by $31.8 billion, which are equivalent to 22.4% of the average export level for years 2000-2003[16]. In turn, improvements in trade facilitation in Mexican partners would increase Mexican exports by $2 billion (1.4% of Mexican exports). Combining both impacts gives a total expected increase in Mexican exports of $33.8 billion, equivalent to 23.8% of Mexican average exports level for years 2000-2003.

Besides updating the estimating approach, the main contribution of this paper is the analysis of impacts by sector. Following Table 5, it can be seen that the simulation brings a higher impact of Mexico's unilateral improvements in trade facilitation measures on Machinery exports (59%), and lower, although still important, percentage impacts in Textiles (41.2%), Vehicles (28.4%) and in Food exports (11.5%). As our simulation involves improvements in trade facilitation in other countries that are below the mean, Mexican exports get an additional boost (although only of relative importance in Food exports) from this source. In the remaining sectors, more that 95% of the increased exports are coming from Mexico's own reforms.

The impact on Mexican imports is shown in Table 6. The overall expected impact on imports is about $24.2 billion, equivalent to 16% of Mexican average imports level for years 2000-2003. The simulation brings a higher percentage impact on Food, Beverage and Tobacco imports (19.7%) Textile imports (13.9%), and lower impacts in Machinery (12.2%) and in Vehicles (3.9%). At the aggregate level, about 70% of the changes in imports are due to Mexican reforms in trade facilitation, and in particular from improvements in Port Efficiency ($19 gains from Mexico's reform divided by total gains of $24.4 billion).

Which trade facilitation reform measure is more important for Mexico? Table 7 shows a summary of results for the expected impact of own reform on exports and imports, as a share of the overall effect of the simulations carried out in the paper. On the exports side, Mexico's own reforms in Port Efficiency (a "border measure") are as important as improvements in the Control

[15] Although the specification of the gravity model and the years covered by the data are different from the ones used here, it is worth to compare this figure with that of WMO(2004), where total export gains were estimated in $377 billion, about 9.7% of total world trade in manufacture. In any event, expected gains are important.
[16] In WMO (2004), total export gains for Mexico were estimated in $17.3 billion.

of corruption (an "inside de border" measure). On the imports side, the main action is driven by improvements in Port Efficiency, and to a lesser extent by improvements in the Service Sector infrastructure. This picture varies when the analysis is done by sector. Following Table 7 it can be seen that for exports, improvements in Port Efficiency have a greater impact in Textiles and Transport equipment exports, whereas improvements in the Control of Corruption seem to have a bigger impact in Food and Machinery exports. On the imports side, by far the bigger impact is coming from improvements in Port Efficiency, although for imports of Transport equipment improvements in Service Sector infrastructure are also of importance.[17]

It remains for further research the question of how much would be for Mexico the cost of reaching half the way to mean in the trade facilitation variables modeled here. We can only point out that the costs of many of the regulatory reform and related improvements examined here are likely not a high cost, relative to infrastructure improvements.

7. Conclusions and Approach to Capacity Building Design for Mexico

The analysis in this paper builds on the method developed in Wilson, Mann and Otsuki (2003) and extends results presented by these authors in two ways. We analyze here impacts of changes in trade facilitation measures on trade for main industrial sectors in Mexico. Four indicators of trade facilitation are used: Port Efficiency, Customs Environment, Regulatory Environment, and e-commerce use by business (as a proxy for Service Sector Infrastructure). These indicators were implemented in the latest version of a gravity model of trade. The total gain in trade flow in manufacturing goods from trade facilitation improvements in all four areas is estimated to be $348.2 billion.

The analysis in this paper indicates that Mexico has a large scope for trade promotion from trade facilitation reform: overall gains *from own reforms* are expected to be in the order of $31.8 billion, equivalent to 22.4% of total Mexican manufacturing exports. Most of these exports increase are coming from improvements in Port Efficiency and in the Regulatory Environment

[17] As part of this analysis and in line with other studies, we found a relatively low elasticity of labor demand of about 0.03, positive for both, imports and exports in Mexico. When we applied these estimates to the expected increase in exports and imports, an increase of about 16 thousand industrial laborers is linked to improvements in trade facilitation measures. About half of the increased labor demand comes from the textile sector, which has the higher demand elasticity to international trade (0.062) and also the higher expected increase in exports and imports (46% and 14% respectively)

(i.e., the perception of corruption). On the imports side, these figures are $17.1 billion and 11.2%, respectively and, the most important single factor is also the improvement in Port Efficiency. Sector wise, greater Textiles and Transport Equipment exports are expected to come after improvements in Port Efficiency, whereas greater exports of Food and Textiles would come from improvements in the Regulatory Environment. On the imports side, greater imports are expected to come mainly from improvements in Port Efficiency, although for imports of Transport Equipment, improvements in the Service Sector Infrastructure showed also to be of importance. It will be useful to explore further which sector specific issues (e.g., risk of spoilage in food trade) are driven by our results, and also to better assess the plausibility of the unexpected negative signs found for some variables.

Our results show that unilateral trade facilitation reforms for the case of Mexico could generate an increment of more than 20% for exports as well as about 11% for imports. This suggests that trade facilitation measures, including estimating the costs that would be involved for Mexico to improve these indicators, should be considered seriously in any discussion about trade policy.

Data Appendix[18]

Data come from the World Economic Forum, Global Competitiveness Report, 2001-02 (GCR), IMD Lausanne, World Competitiveness Yearbook 2002 (WCY), and Kaufmann, Kraay and Zoido-Lobaton (2002) (KKZ). All survey data in GCR comes from the World Economic Forum's Executive Opinion Survey. A total of 4022 firms were surveyed. "In order to provide the basis for a comparative assessment on a global basis, it is essential that we interview a sufficient number of senior business leaders in individual countries and that the sample in each country is not biased in favor of any particular business group. We have taken a number of steps to ensure this.

First, we have asked each of our partner institutes, the organizations that administer the surveys in each country, to start with a comprehensive register of firms. From this, they were asked to choose a sample whose distribution across economic sectors was proportional to the distribution of the country's labor force across sectors, excluding agriculture. They were then asked to choose firms randomly within these broad sectors (for example, by choosing firms at

[18] Follows the presentation of WMO(2004)

regular intervals from an alphabetic list), and to pursue face-to-face interviews, following up for clarifications where necessary. The employment distribution was taken from data in the 1998 *Yearbook of Labour Statistics* of the International Labour Office. The respondents to the survey are typically a company's CEO or a member of its senior management."

The WCY uses a 115 question survey sent to executives in top and middle management of firms in all 49 countries of the WCY. The sample size of each country is proportional to GDP, and firms "normally have an international dimension." The firms are selected to be a cross section of manufacturing, service, and primary industries. There were 3532 responses to the Survey. KKZ (2002) updates the data on governance that were developed in Kaufmann, Kraay and Zoido-Lobaton (1999) "Governance Matters." The database contains more than 300 governance indicators for 175 countries compiled from a variety of sources in 2000/2001. Six aggregate indicators are constructed corresponding to six basic governance concepts: Voice and Accountability, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption.

The various raw data series were chosen because of their relevance to the four concepts of trade facilitation.

Port efficiency for each country *J* is the average of two indexed inputs (all GCR):

o Port facilities and inland waterways are :(1=underdeveloped, 7=as developed as the world's best, GCR)

o Air transport is :(1=infrequent and inefficient, 7=as extensive and efficient as the world's best, GCR)

Customs environment for each country *J* is the average of two indexed inputs (all GCR):

o Hidden import barriers other than published tariffs and quotas

o Irregular extra payments or bribes connected with import and export permits

Regulatory environment for each country *J* is constructed as the average of four indexed inputs:

o Transparency of government policy is satisfactory (WCY)

o Control of Corruption (KKZ)

Service sector infrastructure for each country *J* is as the average of two indexed inputs (all GCR):

o Speed and cost of internet access are: (1=slow and expensive, 7=fast and cheap)

o Internet contribution to reduce inventory costs is: (1=no improvement, 7=huge improvement)

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Table 1

		Source	Mean	Std.Dev	Min	Min Importer	Max	Max Importer	MEXICO	MEXICO/ MEAN	MEXICO/ Min	MEXICO/ Max
Port Efficiency	Port Facilities	GCR	0.636	0.188	0.261	Bolivia	1.000	Singapore	0.478	0.75	1.83	0.48
	Air Transport	GCR	0.710	0.165	0.229	Slovak Rep	1.000	Singapore	0.686	0.97	3.00	0.69
Aggregate Index			**0.673**	**0.168**	**0.345**	**Bolivia**	**1.000**	**Singapor**	**0.582**	**0.87**	**1.69**	**0.58**
Custom Environment	Hidden Import Barriers	GCR	0.702	0.165	0.368	Paraguay	1.000	Finland	0.706	1.01	1.92	0.71
	Bribery	GCR	0.689	0.174	0.343	Bangladesh	1.000	Finland	0.614	0.89	1.79	0.61
Aggregate Index			**0.695**	**0.162**	**0.384**	**Paraguay**	**0.979**	**Finland**	**0.660**	**0.95**	**1.72**	**0.67**
Regulatory Environmer	Transparency of Government Policies	WYC	0.619	0.203	0.089	Argentina	1.000	Finland	0.631	1.02	7.11	0.63
	Control of Corrupton	KKZ	0.744	0.140	0.530	South Africa	1.000	Finland	0.651	0.88	1.23	0.65
Aggregate Index			**0.708**	**0.157**	**0.353**	**Venezuela**	**1.000**	**Finland**	**0.641**	**0.91**	**1.82**	**0.64**
Service sector infrastru	Speed and Costs of Internet Access	GCR	0.629	0.161	0.348	Vietnam	1.000	Finland	0.580	0.92	1.67	0.58
	Effect of Internet on Business	GCR	0.719	0.101	0.481	Greece	1.000	Finland	0.712	0.99	1.48	0.71
Aggregate Index			**0.674**	**0.120**	**0.482**	**Mauritius**	**1.000**	**Finland**	**0.646**	**0.96**	**1.34**	**0.65**

Source: Authors' calculation based on Global Competitiveness Report (2001-2002), Kaufmann, Kraay and Zoido Lobaton (2002), and World Competitiveness Yearbook (2002).

Table 2

Variable	World Industrial Exports, in billions of dollars of 2002 (*)	Share of Mexico in World's exports	Share of Mexico in World's imports
Total	4,734.0	3.0%	3.0%
Food, Beb. and Tobac	222.9	2.7%	1.6%
Textiles	346.5	3.1%	2.6%
Vehicles	700.6	4.0%	2.6%
Machinery	1,670.1	4.0%	3.8%

(*) For the 75 countries included in the sample
Source: Own estimates using COMTRADE

Table 3

Gravity model. Results from negative binomial estimates:Trade Facilitation variables								
	Total manufactures				&Tob.	Textiles	Vehicles	Machinery
Variable	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
ln Tariffs	-0.921	---	-0.97	-0.849	1.737	-0.364	-1.504	-4.107
	(2.62)**	---	(2.67)**	(2.61)**	(2.71)**	-0.46	-1.55	(6.40)**
ln Port Efficiency exporter	1.157	1.139	---	1.131	0.164	2.259	2.109	0.904
	(5.23)**	(5.11)**	---	(5.00)**	-0.44	(8.11)**	(4.39)**	(3.02)**
ln Port Efficiency importer	1.566	1.456	1.434	---	1.986	1.351	1.372	1.345
	(6.68)**	(6.16)**	(6.41)**	---	(5.42)**	(3.96)**	(3.61)**	(3.06)**
ln Corruption exporter	1.191	1.241	---	1.349	1.515	2.096	-0.751	5.774
	(3.22)**	(3.29)**	---	(3.30)**	(3.87)**	(3.55)**	-1.39	(7.15)**
ln Corruption importer	0.334	0.36	0.228	---	0.961	-0.309	-1.974	0.698
	-1.15	-1.25	-0.76	---	(2.14)*	-0.55	(3.41)**	-1.5
ln Custom Environment exp.	0.676	0.656	---	0.562	-0.132	1.338	3.55	-0.064
	(2.08)*	(2.01)*	---	(1.68)+	-0.35	(2.12)*	(5.35)**	-0.12
ln Custom Environment imp.	-1.03	-1.09	-1.05	---	-0.815	0.375	-0.275	-0.698
	(3.83)**	(4.08)**	(3.83)**	---	(1.79)+	-0.82	-0.65	(1.77)+
ln Service Sector Infr. exp.	0.748	0.743	---	0.711	0.098	-0.137	-1.894	-0.056
	(1.96)+	(1.95)+	---	(1.82)+	-0.14	-0.27	(1.99)*	-0.09
ln Service Sector Infr. imp.	0.628	0.961	0.721	---	-0.823	1.14	1.96	1.252
	(1.74)+	(2.99)**	(1.99)*	---	(1.70)+	(2.37)*	(3.63)**	(1.99)*
# observations	5375	5375	5375	5375	5291	5313	5265	5322
Robust t statistics in parentheses								
+ significant at 10%; * significant at 5%; ** significant at 1%								
Source: Own estimates. Full set of results is presented in the Annex								

Table 4

Expected impact on Industrial trade values from improvements in Trade Facilitation										
	World Exports		Food Industries		Textiles		Transport Equipment		Machinery	
Source	Change, in $	Change in %	Change, in $	Change in %	Change, in $	Change in %	Change, in $	Change in %	Change, in $	Change in %
Exporter										
Port Efficiency "i"	93.0	2.0	0.0	0.0	31.4	9.1	13.9	2.0	34.6	2.1
Corruption "i"	78.3	1.7	11.8	5.3	22.2	6.4	0.0	0.0	182.0	10.9
Custom Environment "i"	55.7	1.2	0.0	0.0	18.4	5.3	29.9	4.3	0.0	0.0
Service Sector Infrastructure "i"	47.0	1.0	0.0	0.0	0.0	0.0	-8.0	-1.1	0.0	0.0
Total Exporter	**274.0**	**5.8**	**11.8**	**5.3**	**72.1**	**20.8**	**35.7**	**5.1**	**216.6**	**13.0**
Importer										
Port Efficiency "j"	110.5	2.3	10.5	4.7	6.8	1.9	11.6	1.7	33.7	2.0
Corruption "j"	0.0	0.0	4.1	1.9	0.0	0.0	-13.8	-2.0	0.0	0.0
Custom Environment "j"	-69.6	-1.5	-4.0	-1.8	0.0	0.0	0.0	0.0	-17.1	-1.0
Service Sector Infrastructure "j"	33.3	0.7	-2.9	-1.3	4.1	1.2	11.1	1.6	25.4	1.5
Total Importer	**74.2**	**1.6**	**7.7**	**3.5**	**10.9**	**3.1**	**8.9**	**1.3**	**42.0**	**2.5**
Total impact	348.2	7.4	19.5	8.7	83.0	23.9	44.6	6.4	258.6	15.5
Source: Own estimates										

Table 5

Expected impact on Mexican industrial exports values from improvements in Trade Facilitation										
	Mexican exports		Food Industries		Textiles		Transport Equipment		Machinery	
Source	Change, in $	Change in %	Change, in $	Change in %	Change, in $	Change in %	Change, in $	Change in %	Change, in $	Change in %
Mexico's unilateral improvement										
Port Efficiency "i"	13.6	9.5	0.0	0.0	2.1	20.2	5.5	19.7	5.1	7.6
Corruption "i"	12.6	8.9	0.7	11.5	1.7	16.3	0.0	0.0	34.5	51.4
Custom Environment "i"	3.0	2.1	0.0	0.0	0.5	4.8	3.9	14.1	0.0	0.0
Service Sector Infrastructure "i"	2.6	1.8	0.0	0.0	0.0	0.0	-1.5	-5.3	0.0	0.0
Total Exporter	**31.8**	**22.4**	**0.7**	**11.5**	**4.4**	**41.2**	**7.9**	**28.4**	**39.7**	**59.0**
Improvements in Mexican partners										
Port Efficiency "j"	3.3	2.3	0.3	5.3	0.1	1.3	0.4	1.5	1.0	1.5
Corruption "j"	0.0	0.0	0.1	1.8	0.0	0.0	-0.4	-1.5	0.0	0.0
Custom Environment "j"	-2.1	-1.5	-0.1	-1.8	0.0	0.0	0.0	0.0	-0.5	-0.8
Service Sector Infrastructure "j"	0.8	0.6	-0.1	-1.1	0.1	0.6	0.4	1.3	0.6	0.9
Total Importer	**2.0**	**1.4**	**0.2**	**4.2**	**0.2**	**1.9**	**1.1**	**1.3**	**1.1**	**1.6**
Total impact	**33.8**	**23.8**	**0.9**	**15.7**	**4.6**	**43.1**	**8.3**	**29.7**	**40.8**	**60.7**
Source: Own estimates										

Table 6

Expected impact on Mexican industrial imports values from improvements in Trade Facilitation										
	Mexican imports		Food Industries		Textiles		Transport Equipment		Machinery	
Source	Change, in $	Change in %	Change, in $	Change in %	Change, in $	Change in %	Change, in $	Change in %	Change, in $	Change in %
Mexico's unilateral improvement										
Port Efficiency "j"	19.0	12.5	0.6	16.9	1.1	11.1	2.1	12.2	7.7	11.1
Corruption "j"	0.0	0.0	0.2	7.1	0.0	0.0	-2.4	-13.8	0.0	0.0
Custom Environment "j"	-4.1	-2.7	-0.1	-2.3	0.0	0.0	0.0	0.0	-1.4	-2.0
Service Sector Infrastructure "j"	2.1	1.4	-0.1	-2.0	0.3	2.7	1.0	5.6	2.1	3.1
Total Importer	**17.1**	**11.2**	**0.7**	**19.7**	**1.4**	**13.9**	**0.7**	**3.9**	**8.5**	**12.2**
Improvements en Mexican partners										
Port Efficiency "i"	2.6	1.7	0.0	0.0	0.7	7.0	0.1	0.4	0.9	1.3
Corruption "i"	2.0	1.3	0.2	6.3	0.5	4.7	0.0	0.0	4.6	6.7
Custom Environment "i"	1.6	1.1	0.0	0.0	0.4	4.2	0.2	1.1	0.0	0.0
Service Sector Infrastructure "i"	1.1	0.7	0.0	0.0	0.0	0.0	-0.04	-0.2	0.0	0.0
Total Exporter	**7.3**	**4.8**	**0.2**	**6.3**	**1.6**	**15.9**	**0.2**	**1.3**	**5.5**	**7.9**
Total impact	**24.4**	**16.0**	**0.9**	**26.0**	**2.9**	**29.8**	**0.9**	**5.2**	**14.0**	**20.1**
Source: Own estimates	**0.160**									

Table 7

Share of Mexican efforts in TF on total impact simulations					
Trade facilitation measures	Impact on exports				
"Border Measures"	Total	Food	Textiles	Transport	Machinery
Port Efficiency	40%	0%	47%	66%	13%
Custom Environment	9%	0%	11%	47%	0%
"Inside the Borders Measures"					
Corruption	37%	73%	38%	0%	85%
Service Sector Infrastructure	8%	0%	0%	-18%	0%
% of the total impact on expo	**94%**	**73%**	**96%**	**96%**	**97%**
"Border Measures"	Impact on imports				
Port Efficiency	78%	65%	37%	232%	55%
Custom Environment	-17%	-9%	0%	0%	-10%
"Inside the Borders Measures"					
Corruption	0%	27%	0%	-264%	0%
Service Sector Infrastructure	9%	-8%	9%	106%	15%
% of the total impact on impo	**70%**	**76%**	**46%**	**75%**	**61%**
Source: Own estimates					

Annex

Gravity model. Results from negative binomial estimates								
	Total manufactures				Food.Bev. &Tob.	Textiles	Vehicles	Machinery
Variable	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
ln Tariffs	-0.921	---	-0.97	-0.849	1.737	-0.364	-1.504	-4.107
	(2.62)**	---	(2.67)**	(2.61)**	(2.71)**	-0.46	-1.55	(6.40)**
ln Port Efficiency exporter	1.157	1.139	---	1.131	0.164	2.259	2.109	0.904
	(5.23)**	(5.11)**	---	(5.00)**	-0.44	(8.11)**	(4.39)**	(3.02)**
ln Port Efficiency importer	1.566	1.456	1.434	---	1.986	1.351	1.372	1.345
	(6.68)**	(6.16)**	(6.41)**	---	(5.42)**	(3.96)**	(3.61)**	(3.06)**
ln Corruption exporter	1.191	1.241	---	1.349	1.515	2.096	-0.751	5.774
	(3.22)**	(3.29)**	---	(3.30)**	(3.87)**	(3.55)**	-1.39	(7.15)**
ln Corruption importer	0.334	0.36	0.228	---	0.961	-0.309	-1.974	0.698
	-1.15	-1.25	-0.76	---	(2.14)*	-0.55	(3.41)**	-1.5
ln Custom Environment exp.	0.676	0.656	---	0.562	-0.132	1.338	3.55	-0.064
	(2.08)*	(2.01)*	---	(1.68)+	-0.35	(2.12)*	(5.35)**	-0.12
ln Custom Environment imp.	-1.03	-1.09	-1.05	---	-0.815	0.375	-0.275	-0.698
	(3.83)**	(4.08)**	(3.83)**	---	(1.79)+	-0.82	-0.65	(1.77)+
ln Service Sector Infr. exp.	0.748	0.743	---	0.711	0.098	-0.137	-1.894	-0.056
	(1.96)+	(1.95)+	---	(1.82)+	-0.14	-0.27	(1.99)*	-0.09
ln Service Sector Infr. imp.	0.628	0.961	0.721	---	-0.823	1.14	1.96	1.252
	(1.74)+	(2.99)**	(1.99)*	---	(1.70)+	(2.37)*	(3.63)**	(1.99)*
ln GDP exporter	1.048	1.047	1.066	1.059	0.861	1.156	1.316	1.633
	(37.78)**	(37.66)**	(41.11)**	(38.78)**	(18.95)**	(27.01)**	(19.48)**	(30.95)**
ln GDP per capita exporter	-0.408	-0.409	0.098	-0.402	-0.557	-1.01	-0.239	-0.351
	(6.72)**	(6.76)**	(2.77)**	(6.45)**	(5.52)**	(8.76)**	-1.62	(2.65)**
ln GDP importer	0.792	0.791	0.782	0.805	0.726	0.641	0.554	0.807
	(35.15)**	(34.87)**	(34.42)**	(37.00)**	(18.92)**	(14.67)**	(11.55)**	(25.67)**
ln GDP per capita importer	-0.087	-0.048	-0.07	0.134	-0.33	-0.451	0.135	-0.014
	-1.55	-0.9	-1.23	(4.14)**	(3.79)**	(4.37)**	-1.16	-0.17
ln Distance	-1.146	-1.149	-1.167	-1.105	-0.86	-1.047	-1.225	-1.171
	(25.99)**	(25.72)**	(26.43)**	(23.42)**	(13.28)**	(16.54)**	(14.18)**	(15.25)**
Dummy Adjacency	0.621	0.617	0.511	0.54	0.646	0.827	0.546	0.883
	(4.18)**	(4.17)**	(3.41)**	(3.72)**	(3.10)**	(4.73)**	(2.37)*	(3.70)**
Dummy ASEAN	0.724	0.748	0.806	0.974	0.574	-0.214	1.511	1.561
	(3.57)**	(3.68)**	(4.29)**	(4.85)**	(2.29)*	-0.79	(3.85)**	(4.03)**
Dummy NAFTA	0.173	0.145	-0.144	0.107	0.449	0.089	1.352	-0.516
	-0.54	-0.46	-0.52	-0.34	-1.5	-0.16	(3.53)**	-1.45
Dummy LAIA	0.642	0.608	0.576	0.4	0.749	0.735	1.522	0.188
	(3.04)**	(2.87)**	(2.91)**	(1.90)+	(2.59)**	(2.80)**	(4.91)**	-0.53
Dummy AUNZ	1.464	1.493	1.497	1.507	2.104	1.703	2.082	1.148
	(6.46)**	(6.52)**	(8.48)**	(5.75)**	(8.20)**	(7.26)**	(5.22)**	(3.74)**
Dummy MERCOSUR	0.343	0.343	0.188	0.567	0.271	0.445	-0.471	-1.101
	-0.65	-0.65	-0.43	-1.12	-0.54	-0.95	-1.11	(2.56)*
Dummy EU	0.32	0.345	0.444	0.283	0.691	-0.124	0.486	0.269
	(3.17)**	(3.48)**	(4.47)**	(2.73)**	(5.30)**	-0.74	(2.41)*	(2.04)*
Dummy English	0.794	0.794	0.871	0.837	1.038	0.676	0.365	0.979
	(7.81)**	(7.70)**	(8.55)**	(8.32)**	(6.83)**	(4.80)**	(2.32)*	(5.95)**
Dummy French	-0.34	-0.331	-0.032	-0.238	0.514	-0.91	-0.822	-0.741
	(2.04)*	(1.98)*	-0.15	-1.56	(1.86)+	(2.86)**	(1.69)+	(3.77)**
Dummy Spanish	0.26	0.271	0.024	0.288	0.93	0.048	-0.857	0.292
	(2.23)*	(2.30)*	-0.21	(2.45)*	(5.91)**	-0.24	(3.53)**	-1.49
Dummy Arabic	-2.768	-2.797	-2.249	-2.204	-2.913	-3.208	-4.64	-2.808
	(16.93)**	(17.43)**	(14.95)**	(14.83)**	(10.72)**	(13.36)**	(17.57)**	(10.86)**
Dummy Chinese	1.139	1.154	1.393	1.237	0.852	1.196	-0.784	1.016
	(5.50)**	(5.59)**	(6.21)**	(6.45)**	(2.74)**	(3.03)**	(2.04)*	(3.49)**
Dummy German	0.469	0.461	0.467	0.461	0.388	0.25	0.308	0.35
	(2.77)**	(2.77)**	(2.76)**	(3.27)**	-1.49	-0.72	-0.79	(1.80)+
Dummy Russian	0.952	1.008	1.114	1.171	1.756	0.67	1.194	1.356
	(5.64)**	(5.96)**	(5.27)**	(7.15)**	(5.48)**	(2.12)*	(3.18)**	(5.65)**
Dummmy Portuguese	-0.266	-0.221	-0.335	-0.526	1.291	-0.157	-0.256	-0.781
	-0.9	-0.74	-1.24	(3.23)**	(2.75)**	-0.84	-0.91	(2.80)**

Gravity model. Results from negative binomial estimates (cont)								
	Total manufactures				Food.Bev. &Tob.	Textiles	Vehicles	Machinery
Variable	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Cross terms with industrialized countries (1)								
ln Tariffs	1.718		1.444	2.711	1.08	3.072	-0.749	1.182
	-0.91		-0.78	-1.33	-1.35	(3.37)**	-0.65	-1.33
ln Port Efficiency exporter	0.263	0.204		0.433	1.651	-2.197	4.31	-2.069
	-0.51	-0.4		-0.78	(2.31)*	(2.85)**	(4.73)**	(3.39)**
ln Port Efficiency importer	0.775	0.903	1.074		1.493	0.379	2.28	0.71
	-1.11	-1.28	-1.46		(1.74)+	-0.38	-1.62	-0.57
ln Corruption exporter	-1.92	-1.897		-1.736	-6.995	-4.118	-3.644	-6.867
	(2.49)*	(2.45)*		(1.93)+	(7.73)**	(3.32)**	(3.10)**	(6.49)**
ln Corruption importer	-0.775	-0.898	-1.017		0.122	-5.024	-1.557	-2.25
	-0.79	-0.91	-0.97		-0.12	(3.73)**	-0.61	(1.77)+
ln Custom Environment exp.	-3.162	-3.193		-3.366	6.421	-4.514	-10.267	-1.584
	(4.78)**	(4.87)**		(4.35)**	(7.63)**	(3.51)**	(8.42)**	(2.06)*
ln Custom Environment imp.	0.839	0.9	1.019		0.494	5.358	3.162	1.98
	-0.99	-1.06	-1.1		-0.49	(5.05)**	(1.74)+	(1.73)+
ln Service Sector Infr. exp.	0.507	0.551		0.29	-0.125	1.194	2.797	3.817
	-0.82	-0.89		-0.42	-0.13	-1.17	(2.36)*	(5.05)**
ln Service Sector Infr. imp.	-0.625	-0.978	-0.699		-0.552	-0.229	-3.382	0.173
	-1.09	(1.78)+	-1.15		-0.77	-0.27	(3.41)**	-0.18
ln GDP exporter	-0.229	-0.229	-0.089	-0.239	-0.242	-0.243	-0.329	-0.73
	(5.17)**	(5.14)**	(2.45)*	(5.03)**	(3.68)**	(3.46)**	(3.93)**	(11.06)**
ln GDP per capita exporter	0.018	0.019	-0.24	-0.014	0.578	0.128	-0.138	0.529
	-0.28	-0.3	(4.26)**	-0.2	(6.08)**	-1.32	-1.13	(5.76)**
ln GDP importer	0.018	0.014	0.007	0.05	0.05	0.234	0.06	0.054
	-0.4	-0.32	-0.15	-1.41	-0.93	(3.25)**	-0.68	-0.84
ln GDP per capita importer	-0.216	-0.226	-0.218	-0.212	-0.475	-0.172	-0.032	-0.283
	(3.28)**	(3.53)**	(3.20)**	(3.74)**	(6.01)**	(1.65)+	-0.26	(3.12)**
ln Distance exporter	0.213	0.209	0.358	0.259	-0.257	-0.007	0.46	0.178
	(4.65)**	(4.56)**	(6.94)**	(5.33)**	(4.05)**	-0.09	(5.49)**	(2.41)*
Dummy Adjacency exporter	-0.315	-0.325	0.071	-0.236	-0.51	-0.238	0.308	-0.764
	(1.74)+	(1.81)+	-0.38	-1.37	(1.98)*	-0.75	-1.26	(3.08)**
ln Distance importer	0.197	0.209	0.228	0.123	0.519	-0.069	-0.049	0.191
	(4.18)**	(4.23)**	(4.50)**	(2.62)**	(7.35)**	-1.02	-0.48	(2.08)*
Dummy Adjacency importer	-0.097	-0.068	-0.146	-0.071	0.463	-0.354	-0.698	-0.223
	-0.53	-0.37	-0.78	-0.41	(1.81)+	-0.96	(2.22)*	-0.86
Constant	6.341	6.084	0.55	3.204	6.207	12.569	0.652	-1.092
	(6.72)**	(6.45)**	-0.72	(3.73)**	(4.11)**	(7.11)**	-0.33	-0.69
# observations	5375	5375	5375	5375	5291	5313	5265	5322
Robust t statistics in parentheses								
+ significant at 10%; * significant at 5%; ** significant at 1%								
(1) Each variable for exporter was multiplied by a dummy that equals 1 when the exporter was an industrialized country								
Each variable for importer was multiplied by a dummy that equals 1 when the importer was an industrialized country								
Source: Own estimates								