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Examining the Trade Effect of Certain Customs and Administrative Procedures

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EXAMIING THE TRADE EFFECT OF CERTAIN CUSTOMS AND ADMINISTRATIVE PROCEDURES

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by Norbert Wilson

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ABSTRACT

Recent research at OECD provides new evidence that customs and administrative procedures have substantial effects on trade flows. Although customs and administrative procedures are necessary for the smooth application of trade and other policies, they can "thicken" the borders between trading partners if the customs and administrative procedures are more stringent than necessary or inefficient. We use metrics of customs and administrative procedures from the World Bank "Doing Business" survey (2005) to estimate gravity models to estimate the effects of the customs and administrative procedures on trade flows between bilateral trade partners.

The results show that all countries can benefit from more efficient customs and administrative procedures, with the greatest benefits accruing to those countries with the least efficient customs and administrative procedures. To gain the greatest benefit from improving customs and administrative procedures, both trade partners need to make efforts, even if these efforts are not equivalent. Additionally, the model suggests that some procedures have a greater effect on trade flows than others.

ACKNOWLEDGMENTS

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The Working Party of the OECD Trade Committee discussed this report and agreed to make the findings more widely available through declassification on its responsibility. The study is available on the OECD website in English and French: http://oecd.org/tad**.**

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EXECUTIVE SUMMARY

As part of OECD's work on non-tariff measures (NTMs), this analysis provides quantitative evidence of the effects of NTMs on trade flows. Recent research at OECD suggests that customs and administrative procedures have substantial effects on trade flows. Although customs and administrative procedures are necessary for the smooth application of trade and other policies, they can "thicken" the borders between trading partners if the customs and administrative procedures are more stringent than necessary or inefficient. In the present analysis we use statistical models with simple simulations to assess more precisely how metrics of customs and administrative procedures influence trade flows.

The World Bank survey "Doing Business" (2005) develops six metrics for customs and administrative procedures. The metrics provide indicators of the time spent at the border of the exporter and the importer, the number of signatures necessary to export or import products, and the number of documents needed to cross the border of the importer and exporter. In practice, the ranking of the metrics for importers and for exporters is similar across metrics. Among the country groups considered, OECD countries have the least number of restrictions in terms of number of documents, number of signatures and days at the border, while Sub-Saharan Africa has the most. According to these metrics, this result suggests that countries in Sub-Saharan Africa have the thickest borders.

We use these metrics in different formulations to estimate, in a gravity model, the effect of the customs and administrative procedures on trade flows between bilateral trade partners. We use the days-at-the-border metric to create a new proxy for trade costs (or distance in the gravity model). We use the estimates from the gravity model in simple simulations to suggest the extent of reform necessary to generate a 10% increase in trade flows between trade partners.

The results show that all countries can benefit from more efficient customs and administrative procedures, with the greatest benefits accruing to those countries with the least efficient customs and administrative procedures. To gain the greatest benefit from improving customs and administrative procedures, both trade partners need to make efforts, even if these efforts are not equivalent. Greater reductions are needed from those partners with less efficient customs and administrative procedures. Lower income trading partners require greater reductions in the number of days to attain similar percentage increases in exports. The greatest benefits accrue from improving those procedures relevant for moving products that are most sensitive to cumbersome and long customs and administrative procedures. Additionally, depending on the cost of reduction, it would seem that reducing the number required documents or signatures generates greater benefits than similar reductions in the numbers of days. These results are indicative of the direction and relative importance of different customs and administrative procedures in affecting trade. The results do not provide evidence of the actual amount that will be gained from improved customs.

EXAMINING THE TRADE EFFECT OF CERTAIN CUSTOMS AND ADMINISTRATIVE PROCEDURES

Introduction

1. The Trade Directorate has developed an extensive body of work analyzing non-tariff measures (NTMs). Much of this work has looked at specific NTMs, such as custom fees and charges, quantitative restrictions, etc. Some papers have provided a broader perspective, e.g. by assessing NTMs of concern to developing countries. Much of this work has been qualitative; however, some quantitative research has been undertaken using available business surveys. All of this research provides insights into the nature and function of NTMs (see OECD (2005b)).

2. Despite their recognised importance as trade barriers today, NTMs have not so far assumed a significant role in the Doha Development Agenda (DDA). The main exception is trade facilitation, which addresses a particular type of NTM and figures prominently in the DDA negotiations. Nevertheless, in future rounds of trade negotiations NTMs will very likely play an increasingly important role. Negotiations now and then will benefit from a better understanding of the trade and economic effects of NTMs.

3. In general, efforts to understand the quantitative effects of NTMs have been relatively unsuccessful so far. The Secretariat commissioned Michael Ferrantino, an external consultant to the OECD, to review these efforts in his paper "Quantifying the trade and economic effects of non-tariff barriers" [TD/TC/WP(2005)26/FINAL] (OECD, 2005c). That paper provided an analytical review of "the state of the art" for assessing the quantitative effects of NTBs, in order to serve as a point of departure for possible further efforts to deepen understanding in this area. The Secretariat subsequently proposed in scoping paper TD/TC/TWP(2006)1 to follow this up with efforts to improve understanding in some particular areas (i.e. through the "handicraft" method of analysis), starting with certain aspects of customs and administrative procedures.

4. The study "Analysis of non-tariff barriers of concern to developing countries" (OECD, 2004a) [TD/TC/WP(2004)47/FINAL] identified customs and administrative procedures as one of the most problematic NTBs that developing countries contend. The cumbersomeness of customs and administrative procedures has been a challenge for developing countries in exporting to developed countries but also to other developing countries. As pointed out in the chapter "Overview of NTBs: Findings from Existing Business Surveys," developed countries also find customs and administrative producers cumbersome (OECD, 2005b) Understanding better the trade effects of customs and administrative procedures is important to many developing countries. The current research provides quantitative evidence that excessive customs and administrative procedures are inhibitors to trade.

5. One way to consider the effect of customs and administrative procedures is to say that they "thicken" the borders of countries. Customs and administrative procedures are necessary, but requirements beyond what is necessary to move a product through the border in a manner consistent with local policy objectives may unnecessarily hinder trade by "thickening" the border. The metrics discussed below serve as metrics of the thickness of borders. If this thickness matters to trade, then reducing this thickness will increase trade flows.

6. In the following analysis, we present metrics, produced by the World Bank, of customs and administrative procedures. We compare regions of the world based on these metrics and show that developing countries have relatively thicker borders than developing countries. Then we use these metrics in statistical models. From the results of the models, we run simulations to indicate the extent of reform in customs and administrative procedures to increase trade flows.

Effects of Customs and Administrative Procedures on Trade

7. The current research is based on metrics derived from the World Bank survey called "Doing Business: Benchmarking Business Regulations." In the 2005 survey, a new section was added called "Trading across Borders," which looks at "procedural requirements for exporting and importing a standardized cargo of goods." (World Bank, 2005) The goods considered are coffee, tea, cocoa, spices and manufactures thereof; textile yarn, fabrics, made-up articles; and articles of apparel and clothing accessories The survey contacted local freight forwarders, shipping lines, customs brokers and port officials on the necessary documents, signatures and time to cross the border.

8. For both exports and imports, three types of metrics are available from the World Bank survey: The documentation measure (*Number of Documents*) is the number of documents needed to cross the border. The documents considered include port filing documents, customs declaration and clearance documents and official documents exchanged between the concerned parties. The signature metric (*Number of Signatures*) represents the total number of signatures, stamps or other approvals necessary to satisfy one or more formal procedures. The time metric (*Days at the Border*) is the number of calendar days needed for a product to cross the border.

9. The survey generates a metric for the burdensomeness of customs and administrative procedure for the 156 countries that responded to the survey. Figures 1 and 2 and Table 1 below provide summary statistics for the major regions of the world (see Table 1). The ranking of the metrics for imports and exports is similar across metrics. OECD countries have the least number of restrictions in terms of number of documents, number of signatures and days at the border, while Sub-Saharan Africa has the most. This result indicates that countries in Sub-Saharan Africa have the thickest borders according to these metrics.

10. The differences between Sub-Saharan Africa and OECD countries are large. Consider the coefficients of variation[1] (CV) for the different metrics. The greatest dispersion is in the number of signatures. The least disperse is the number of documents. An implication of the large CVs for *Number of Signatures*$_{Export}$ and *Number of Signatures*$_{Import}$ are that there is greater space, relative to that of the other metrics, for improvements.

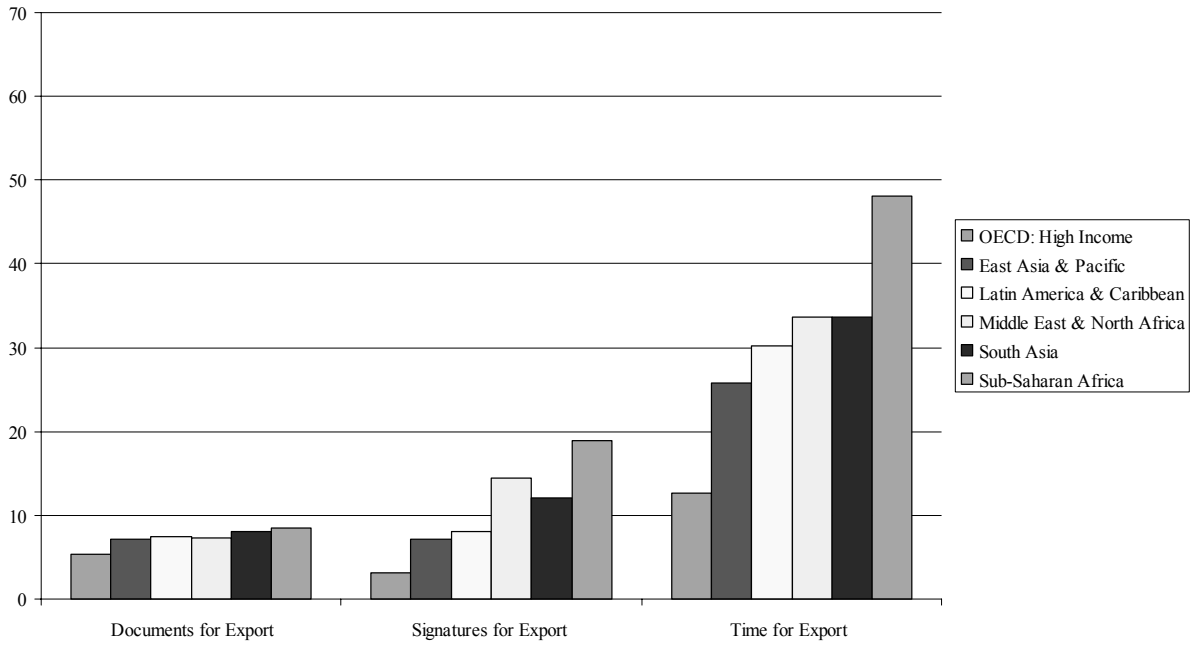
11. These metrics are highly correlated with one another. Consider the correlation coefficients for the *Number of Signatures*$_{Export}$ and *Number of Signatures*$_{Import}$ (0.94) and *Days at the Border*$_{Export}$ and *Days at the Border*$_{Import}$ the number of days for the exporter and importer (0.95). These results suggest that countries tend to treat imports and exports in a similar manner, even though the metrics are statistically different for the exporters and importers. An interesting result is that the number of signatures and days at border are highly correlated with the lowest coefficient of 0.78 for *Number of Signatures*$_{Import}$ and *Days at the Border*$_{Export}$. The correlation suggests that the days or the signatures tend to be similar.[2] The *Number of Documents*$_{Export}$ and *Number of Documents*$_{Import}$ are not as highly correlated with each other and the other

1. The coefficient of variation is a standardised, unit-less measure of dispersion. It is the standard deviation divided by the mean.

2 . Since the data are not time series, we are not able to assert that a change in one metric tends to generate a similar change in the other metrics.

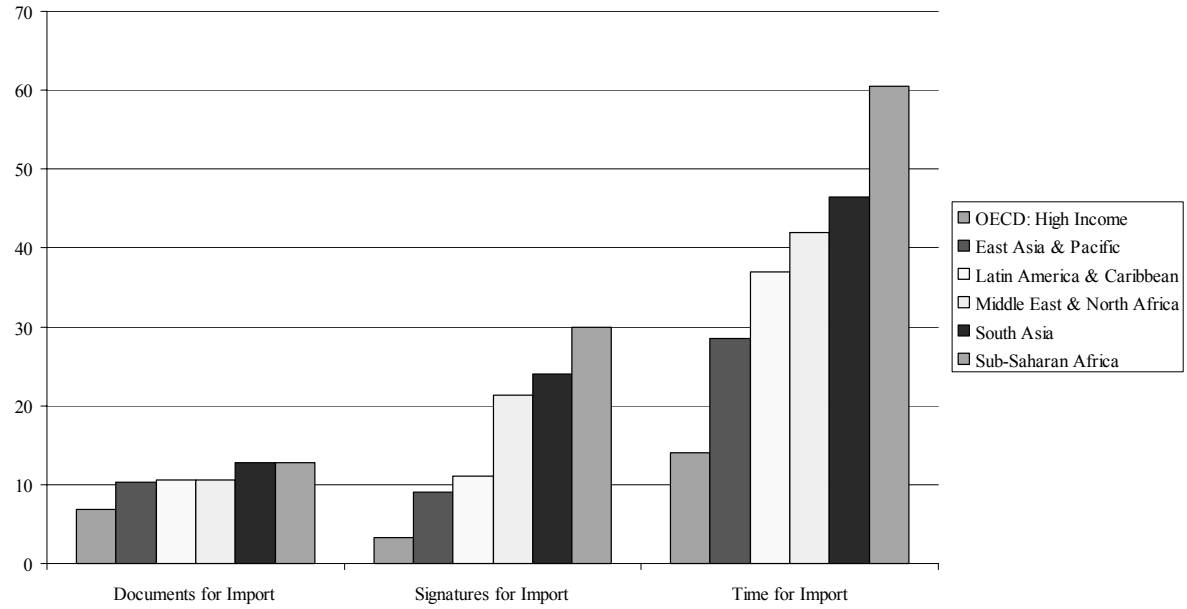
metrics as are the other metrics. Overall, the large coefficients of correlation suggest that countries with thick borders typically have large values for all the metrics for both exports and imports.

Figure 1. Regional Averages of Trading Across Borders Metrics for Exports



Source: World Bank (2005)

Figure 2. Regional Averages of Trading Across Borders Metrics for Imports



Source: World Bank (2005)

Table 1. Regional Averages of Trading Across Borders Metrics

Region or Economy	Number of $Documents_{Export}$	Number of $Signatures_{Export}$	Days at the $Border_{Export}$	Number of $Documents_{Import}$	Number of $Signatures_{Import}$	Days at the $Border_{Import}$
	Regional Averages					
East Asia & Pacific	7.1	7.2	25.8	10.3	9.0	28.6
Latin America & Caribbean	7.5	8.0	30.3	10.6	11.0	37.0
Middle East & North Africa	7.3	14.5	33.6	10.6	21.3	41.9
OECD: High Income	5.3	3.2	12.6	6.9	3.3	14.0
South Asia	8.1	12.1	33.7	12.8	24.0	46.5
Sub-Saharan Africa	8.5	18.9	48.1	12.8	29.9	60.5
	World Summary Statistics					
Average	7.4	11.0	31.6	10.8	16.4	39.8
Standard Deviation	2.2	10.4	19.9	3.9	16.5	26.8
Coefficient of Variation	0.3	1.0	0.6	0.4	1.0	0.7

Source: World Bank (2005)

Table 2. Correlations of Metrics for Customs and Administrative Procedures

	Number of $Documents_{Export}$	Number of $Signatures_{Export}$	Days at the $Border_{Export}$	Number of $Documents_{Import}$	Number of $Signatures_{Import}$	Days at the $Border_{Import}$
Number of $Documents_{Export}$	1.00					
Number of $Signatures_{Export}$	0.52	1.00				
Days at the $Border_{Export}$	0.61	0.80	1.00			
Number of $Documents_{Import}$	0.68	0.56	0.61	1.00		
Number of $Signatures_{Import}$	0.52	0.94	0.78	0.55	1.00	
Days at the $Border_{Import}$	0.61	0.81	0.95	0.64	0.81	1.00

Source: Author's Calculations

12. We now use these metrics in a gravity model to estimate the effect of the corresponding customs and administrative procedures on trade. This method is influenced by the work of Hausman et al. (2005). The gravity model is a common model for trade analysis, and a number of OECD studies show the usefulness of the gravity model (Nicoletti, et al. (2003) [ECO/WKP(2003)13]; OECD (2004c) [COM/TDAGR/WP(2004)45]; OECD (2005d) [TD/TC/WP(2005)34]; among others). This analysis is particularly relevant for understanding the effects of NTBs on trade in goods; it uses an approach similar to that used for the analysis of logistics services (see OECD (2006) [TD/TC/WP(2006)3/REV1)]).[3]

3 . In fact, that project and the current project share the same data base but are different analyses. In OECD (2006), the Secretariat uses a probit model to determine the likelihood of trading given the time it takes for products to cross the border. We look only at trade flows not the probability of trading.

13. We present a preliminary analysis using the metrics described above in the context of a gravity model. The preliminary models regress the 2004 exports of the three products[4] of the World Bank survey on the typical gravity model variables (GDPs for each country, distance, membership in a regional trade agreement (RTA) or preferential trade agreement (PTA), common language, and colonial ties) and the customs metrics. In this preliminary analysis we use only the metrics for imports. That is, we investigate how exports are affected by the customs and administrative procedures of importers. We hypothesize that the metrics should have a negative effect on exports. The gravity model variables are hypothesized to follow the typical pattern: The variables for GDP, language and colonial ties should be positive. Some if not all of the indicator variables for regional (or preferential) trade agreements RTAs (or PTAs) should be positive. The distance variable and the dummy variables for landlocked exporter and importer should be negative. More details of the model are available in Appendix 2.

14. Consider the estimated elasticities, from the preliminary regressions, of each metric to trade flows (see Table 3). These elasticities indicate the effect of a percentage change in the metric on trade flows. For example, a 10% reduction in the time at the border of the importer may increase trade by 6.3% hypothetical. A 10% reduction in the number of signatures required by the importer may increase trade by 9.9% in trade, while a 10% reduction in the number of documents required by the importer may generate an 11.1% increase in trade.

Table 3. Estimated Elasticities of Metrics on Trade Flows

	Estimated Elasticity	Increase in Trade Flows from a 10% Decrease in the Metric
Days at the $\text{Border}_{\text{Imports}}$	-0.63	6.3%
Number of $\text{Signatures}_{\text{Imports}}$	-0.99	9.9%
Number of $\text{Document}_{\text{Imports}}$	-1.11	11.1%

Source: Author's estimates

15. Table 1 presents the regional for the metrics. As was pointed out, several of the regions of mostly developing countries have metrics that are above the average. The significance of this can be understood by considering what percentage reduction in the metric is necessary to take the region to the world average, and then the trade increase that would follow from such a reduction in the metric. The reduction in the metric would represent improvements in the customs and administrative procedures in the importing region. For example, if Sub-Saharan Africa were to reduce the average number of signatures to the world average, there would need to be a reduction of 82.48%, a substantial reduction. Such a reduction would lead to an 81.48% increase in trade flows (see Table 4). [5]

4. The products, as listed by their SITC code, are 07 (coffee, tea, cocoa, spices and manufactures thereof), 65 (textile yarn, fabrics, made-up articles) and 84 (articles of apparel and clothing accessories).

5 . Estimated elasticities are believed to hold for small changes around the mean. Therefore, the large changes presented here need to be interpreted cautiously.

Table 4. Change in Trade Flows with Improvement in Import Metrics

	Days at the Border$_{Import}$	Number of Signatures$_{Import}$	Number of Document$_{Imports}$
	percentage reduction to world average[a]		
East Asia & Pacific			
Latin America & Caribbean			
Middle East & North Africa	-5.41	-30.00	
OECD: High Income			
South Asia	-16.98	-46.48	-18.71
Sub-Saharan Africa	-52.20	-82.49	-18.71
	percentage increase in imports if regional average fell to world average[b]		
East Asia & Pacific			
Latin America & Caribbean			
Middle East & North Africa	3.40	29.63	
OECD: High Income			
South Asia	10.67	45.91	20.66
Sub-Saharan Africa	32.80	81.48	20.66

a. Empty cells indicate averages that are below the world average

b. An implicit assumption is that the elasticities hold everywhere, not just at the average. Additionally, elasticities are typically considered for small changes. At such large changes as those suggested in this table, substantial bias could exist in the estimate of the trade effect.

Source: Author's estimates

Trade Effects of Time-Adjusted Distance

16. In the traditional gravity model, the distance between countries, typically measured as the distance between the capitols or major cities, is used as a proxy for travel costs. As the distance between countries increases, one would expect that the travel costs would increase similarly. However, a reasonable assumption would be that the same distance between two developed countries and two developing counties would not have the same travel costs. Consider the bilateral trade partners presented in Table 5. The distance between Greece and Ethiopia, which ranks second by shortest distance, is similar to the distance between Portugal and Finland, which ranks third by shortest distance. However, the difference between these trading partners in the time necessary for a product to leave the exporting country and enter into the importing country is substantial, a difference of 63 days in total. For time-sensitive products like apparel and clothing accessories, such a time difference may exclude the product from a market (OECD, 2006). Also if there is a cost of storage or refrigeration, these extra days could substantially raise the travel cost. Therefore, we have incorporated the time metric into the distance metric to construct a new metric of distance, *Distance Weighted*.[6] With this new metric we see a different ranking of distances. With the new distance, the trading partners Portugal and Finland are now the closest partners of those in Table 4, while Greece and Ethiopia are now the most far apart in Table 5.

17. The metric of time-weighted distance needs to be used with caution. The adjusted distance is limited to the three products categories and the year for which the time metrics were derived. The time at the border may vary even within the products considered and destination. The metrics for time may actually overestimate the time because there could be time savings for trades of larger sizes or frequently traded products. For these reasons, the new, adjusted distance metric does not obviate the use of the simple distance; however, for this application, the adjusted distance may help us develop better estimates of the cost of customs and other administrative procedures.

6. We also incorporate a measure for remoteness of the exporter, which is discussed in Appendix 2.

Table 5. Distances and Times for Select Bilateral Trade Partners

Exporter	Importer	Distance[a] (in km)	Ranked by Distance[b]	Rank by Distance Adjusted for Days at the Border and Remoteness[b]	Number of Days at the $Border_{Export}$ [b]	Number of Days at the $Border_{mport}$ [b]
Brazil	Bolivia	2,381	1	2	39	49
Brazil	Peru	3,455	5	3	39	31
Bulgaria	Uzbekistan	3,756	6	8	26	139
Canada	Kyrgyzstan	10,058	9	4	12	127
Greece	Ethiopia	3560	2	9	29	57
Kenya	Nigeria	3,806	7	6	45	53
Portugal	Finland	3,363	3	1	18	7
Russia	Afghanistan	3,368	4	7	29	97
Singapore	Denmark	9,978	8	5	6	5

a. The distance variable comes from CEPII (see Gaulier,. Mayer and S. Zignago, (2004)).

b. The distances are ranked from the shortest to the longest distance.

c. The adjusted distance is the distance multiplied by the natural log of the product of the numbers of days to export and import divided by the measure of remoteness. Remoteness is the inverse of the sum of the distance between the exporter and all its importing partners divided by the GDP of the importer.

Source: *Doing Business* (2005)

18. With this adjusted distance variable, we estimate the similar equations (see Table A2.2 in the Appendix 2) as in the preliminary models. The changes are that we include the new time-adjusted distance. For each metric, we use the product of the metric for the importer and exporter, where previously, we only used the metric for the importer. This new version will permit us to see how the changes in the metric will affect exporters and importers separately.

19. The new regressions give us new elasticities for the metrics (see Appendix 2 for the calculation of the new elasticities). The new estimates of the elasticities for the metrics are presented in table 6. The new elasticises are smaller than the old elasticities. Therefore, the new estimates suggest that traders are less responsive to changes in the metrics. Put another way, the new elasticities suggest that traders will have perform greater reforms to get the same level of benefit. The new elasticities are close to the pervious estimates, a result that suggests the robustness of our results. Before considering specific trading partners, let us reconsider the regional effects of efforts to reduce the time at the border: in particular, what reductions in the importers' and exporters' total number of days at the border are sufficient to generate a 10% increase in trade flows based on the regional averages as presented in Table 1?

Table 6. Elasticities for the Metrics under Different Measures of Distance

	Estimated Elasticity (Simple Distance)	Estimated Elasticity (Time-Adjusted Distance)
$Days\ at\ the\ Border_{Imports}$	-0.63	-0.60
$Number\ of\ Signatures_{Imports}$	-0.99	-0.88
$Number\ of\ Document_{Imports}$	-1.11	-0.96

Source: Author's Calculations

20. We present in Table 7 the elasticity of bilateral trade between trading regions and the number of days at the border. This elasticity is generally more responsive for exports from the OECD (read along the highlighted row) and imports into the OECD (read down the highlighted column). The greater responsiveness of the OECD countries is the result of their lower times at the border as exporters and importers. By the same token, Sub-Saharan Africa is the least responsive to changes in trade because of the long times at the border for exports and imports. The relatively less elastic response indicates that greater efforts to reduce the number of days at the border are necessary to achieve the same increase in

trade. It is interesting to note the different elasticities across the regional pairs. When Sub-Saharan Africa exports to the OECD, the elasticity is -0.62. However, when Sub-Saharan Africa exports to itself, the elasticity is smaller -0.59. This difference indicates the differential amounts of adjustment needed by pairs of traders to generate similar percentage improvements in trade.

Table 7. Estimated Elasticities for Days at the Border

Exporter \ Importer	East Asia & Pacific	Latin America & Caribbean	Middle East & North Africa	OECD	South Asia	Sub-Saharan Africa
East Asia & Pacific	-0.61	-0.61	-0.60	-0.64	-0.60	-0.60
Latin America & Caribbean	-0.61	-0.60	-0.60	-0.63	-0.60	-0.60
Middle East & North Africa	-0.61	-0.60	-0.60	-0.63	-0.60	-0.59
OECD	-0.64	-0.63	-0.63	-0.67	-0.63	-0.62
South Asia	-0.61	-0.60	-0.60	-0.63	-0.60	-0.59
Sub-Saharan Africa	-0.60	-0.59	-0.59	-0.62	-0.59	-0.59

Source: Author's Estimations

21. In Table 8, we explore the necessary reductions in the number of days to increase trade by 10%. Using OECD as a benchmark, we see that to increase trade by 10% for exports from the OECD to the OECD, the OECD would have to reduce the number of days at the border for the OECD exporter by 1.08 days. Likewise, to increase imports from OECD to itself, importers would need to reduce the days at the border by 1.20 days. Consider another example: To increase exports from Sub-Saharan Africa to Middle East and North Africa by 10%, Sub-Sahara African exporters would have to reduce the days at the border by 4.74 days, while the Middle Eastern and North African importers would have reduce the number of days at their border by 4.13 days.

22. These results indicate nothing of the costs of implementing border time reductions. Assuming diminishing marginal returns, a reduction of 1.08 days at the border of most OECD countries would be more costly given their relatively efficient customs and administrative procedures, as compared to the cost of a reduction of 4.74 days for Sub-Saharan Africa. For more on the cost of implementing trade facilitation see (OECD 2004b).

Table 8. Necessary Reduction in the Days at the Border to Achieve 10% Increase in Trade

	East Asia & Pacific	Latin America & Caribbean	Middle East & North Africa	OECD	South Asia	Sub-Saharan Africa
			for exporters[a]			
East Asia & Pacific	2.42	2.46	2.47	2.32	2.46	2.48
Latin America & Caribbean	2.87	2.91	2.92	2.76	2.92	2.94
Middle East & North Africa	3.20	3.24	3.26	3.08	3.25	3.27
OECD	1.14	1.15	1.16	1.08	1.16	1.17
South Asia	3.21	3.25	3.27	3.09	3.26	3.28
Sub-Saharan Africa	4.66	4.71	4.74	4.50	4.73	4.76
			for importers[b]			
East Asia & Pacific	2.69	3.52	4.01	1.26	3.82	4.47
Latin America & Caribbean	2.71	3.55	4.04	1.27	3.85	4.51
Middle East & North Africa	2.72	3.57	4.06	1.28	3.87	4.53
OECD	2.58	3.39	3.86	1.20	3.68	4.31
South Asia	2.72	3.57	4.06	1.28	3.87	4.53
Sub-Saharan Africa	2.77	3.62	4.13	1.31	3.93	4.60

a. The reduction in export times is read for export regions on the far left column to import regions across the top row.

b. The reduction in import times is read for import regions across the top row to export regions on the far left column.

Source: Author's Estimation

By Bilateral Pairs

23. Let us now consider bilateral, country pairs to understand better the effect of reductions in the days at the border for the exporter and importer on trade between partners we use the results from Table A2.2. Table 10 presents aggregate trade across the three products for a select group of trading partners. Once again, we consider a reduction in the number of days to achieve a 10% increase in trade and a reduction in the metrics to achieve a 10% increase in trade. Table 9 presents the number of days at the border, the number of signatures and the number of documents for a product to depart an exporting country and enter an importing country.

Table 9. Days at the Border and Number of Signatures for Trade

Exporter	Importer	Days at the Border	Number of Documents	Number of Signatures	Days at the Border	Number of Documents	Number of Signatures
		for the exporter[a]			*for the importer*[a]		
Brazil	Bolivia	39	7	8	49	9	16
Brazil	Peru	39	7	6	31	13	13
Bulgaria	Uzbekistan	26	7	5	139	18	32
Canada	Kyrgyzstan	12	6	2	127	18	27
Greece	Ethiopia	29	7	6	57	13	45
Kenya	Nigeria	45	8	14	53	3	71
Portugal	Finland	18	6	4	7	13	1
Russia	Afghanistan	29	8	8	97	10	57
Singapore	Denmark	6	5	2	5	3	1

a. Each represents averages across all countries. These metrics do not represent the bilateral relationships.

Source: *Doing Business* (2005)

24. From Table 10, we can see the necessary reduction in the number of days to increase trade by 10% between bilateral trade partners. We assume that each partner reduces the number of days by the same percentage (see Appendix 2). The disaggregation, by trade partners, highlights the significant differences amongst the countries in the data. For example if Brazil had reduced the time to export by nearly four days and Bolivia had reduced the export time by nearly five days on average, Brazil could have seen a USD 2.717 million increase in trade to Bolivia. If, at the same time, Peru had reduced the days to import products by nearly three days on average, Brazil could have earned an extra USD 4.0528 million in exports to Peru, for a total of USD 6.760 million. Table 11 considers the necessary reduction in the number of signatures to spur a 10% increase in trade. Considering the same country pairs, had Brazil, Bolivia and Peru reduced the number of signatures or documents by one, Brazil would have exported an additional USD 6.760 million to its two trade partners. Had both partners reduced the number of signatures by one, the increase in trade would have been the same.

25. Another pair of countries to consider is Portugal and Finland. For the three products, exports from Portugal and Finland in 2004 totalled over USD 64.768 million. For Portugal to have exported an extra USD 6.477 million to Finland, Portugal would have had to cut the number of days to export by nearly 1.5 days and Finland 0.58 days (13.9 hours). In terms of the number of signatures, Portugal would have had to cut one signature while Finland would have had to cut one signature.

26. These results point to the benefits of all countries improving customs and administrative procedures. In this experiment had only Brazil decreased it time or signatures, it would have earned only USD 3.877 million, which is just over half of the increase in trade had all partners reduced the time to trade. Similar results can be found with other country pairs.

Table 10. The Necessary Reduction in the Number of Days at the Border to Increase Trade by 10%

Exporter	Importer	Total Exports (in 1 000 USD)[a]	Elasticity for Days at the Border	Reduction in Days at the Border$_{Exporter}$	Reduction in Days at the Border$_{Importer}$
Brazil	Bolivia	27,166.64	-0.59	3.83	4.81
Brazil	Peru	40,527.61	-0.60	3.75	2.98
Bulgaria	Uzbekistan	0.70	-0.57	2.62	14.01
Canada	Kyrgyzstan	4.98	-0.59	1.17	12.36
Greece	Ethiopia	1,044.75	-0.59	2.83	5.57
Kenya	Nigeria	33.68	-0.59	4.46	5.26
Portugal	Finland	64,768.45	-0.69	1.50	0.58
Russia	Afghanistan	1,462.39	-0.58	2.89	9.68
Singapore	Denmark	51,910.47	-0.81	0.42	0.35

a. Total exports include trade of coffee, tea, spices, etc.; textile yarn and fabrics, and apparel and accessories for 2004. Some country pairs do not trade all three products.

Source: Author's Calculations

Table 11. The Necessary Reduction in the Number of Signatures to Increase Trade by 10%

Exporter	Importer	Elasticity for Number of Signatures	Reduction in Signatures for Exporter[a]	Reduction in Signatures for Importer[a]	Elasticity for Number of Documents	Reduction in Documents for Exporter[a]	Reduction in Documents for Importer[a]
Brazil	Bolivia	-0.88	1	1	-0.96	1	1
Brazil	Peru	-0.88	1	1	-0.96	1	1
Bulgaria	Uzbekistan	-0.88	1	2	-0.96	1	1
Canada	Kyrgyzstan	-0.88	1	2	-0.96	1	1
Greece	Ethiopia	-0.88	1	3	-0.96	1	1
Kenya	Nigeria	-0.88	1	5	-0.96	1	1
Portugal	Finland	-0.88	1	1	-0.96	1	1
Russia	Afghanistan	-0.88	1	4	-0.96	1	1
Singapore	Denmark	-0.88	1	1	-0.96	1	1

a. The value was rounded up to one if the value was greater than zero.

Source: Author's Calculations

By Product

27. These results are assumed to hold across all three product groups in the data set. However, some products may be more sensitive to customs and administrative procedures than other products. In the final model specification, we disaggregate the effect of each customs metric for each product in the data set. The model results can be seen in Table A2.3 in Appendix 2. All three products are sensitive to customs and administrative procedures because of the statistically significant results. However some products are more sensitive than others.

Table 12. The Necessary Reductions in the Days at the Border to Increase Trade by 10%

Exporter	Importer	Total Exports (in 1 000 USD)	Elasticity for Days at the Border	Reduction in *Days at the Border*$_{Exporter}$	Reduction in *Days at the Border*$_{Importer}$
			Coffee, Tea and Spices		
Brazil	Bolivia	4599.85	-0.70	2.90	3.65
Brazil	Peru	735.28	-0.71	2.86	2.27
Kenya	Nigeria	1901.66	-0.69	3.38	3.98
			Textile Yarn, Fabrics and Made-up Articles		
Brazil	Bolivia	22675.71	-0.50	4.14	5.20
Brazil	Peru	38956.38	-0.51	4.04	3.21
Kenya	Nigeria	27.99	-0.49	4.83	5.69
Portugal	Finland	30491.19	-0.60	1.58	0.61
			Clothing and Accessories		
Brazil	Bolivia	4490.93	-0.62	3.30	4.14
Brazil	Peru	835.95	-0.63	3.24	2.57
Kenya	Nigeria	4490.93	-0.61	3.84	4.52
Portugal	Finland	34277.26	-0.72	1.44	0.56

Source: Author's Calculations

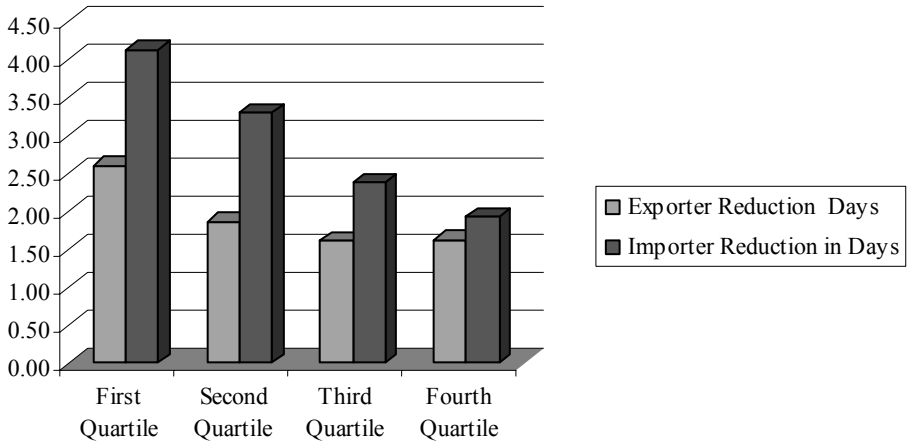
28. A particular case can be seen by looking at the *Days at the Border* and its effect on the trade of the three product groups between Brazil and Bolivia, Brazil and Peru, Kenya and Nigeria, and Portugal and Finland. Textile yarn, fabrics and made-up products appear to be the least sensitive to time for both partners because of the relatively larger reductions in border time necessary to increase trade by 10% for this product group. For trade between Brazil and Peru, a reduction in the number of days by 2.86 and 2.27 would increase trade of coffee, tea and spices by 10%, but trade in textile yarn, fabrics and made-up articles (which had a larger export value to Brazil), would need a greater reduction in days at border 4.04 and 3.21 in order to achieve a 10% increase in trade. A similar result holds for Kenyan exports to Nigeria. This disaggregation shows that to reap the greatest benefits, reductions should be based on those products which are most sensitive to NTMs.

By Income Quartile

29. Another perspective is to consider how these different metrics affect trade flows by income quartiles. We would expect that higher income trading partners would need smaller reductions in the number of days at the border than lower income trading partners. We divide trading partners (pairs of countries) into quartiles, from lower to higher income partners based on per capita income. From the regressions, which are described in more detail in Appendix 2, we find evidence in support of our hypothesis: higher income partners require smaller reductions in the number of days to attain a 10% increase in trade compared to lower income partners (see Figure 3).

Figure 3. The Necessary Reduction in the Number of Days at the Border to Achieve 10% Increase in Trade

by per capita income quartiles[a]



a. The per capita income quartiles represent the distribution of the per capita income for the sum of the square of the logarithm of the per capita income for exporters and importers. The first quartile represents the lowest quartile, and the fourth quartile represents the highest income quartile.

Source: Author's Estimations

Conclusions

30. These results generate a series of questions: What does it mean for a country to eliminate one document or one signature? Does removing a signature reduce the amount of time that a product waits at the border? Does one fewer document hamper the ability customs authorities to process a product? Would one less signature increase the risk of importing dangerous goods? How much control does a government have to lower the days at the border if private firms are involved in some part of customs clearance? These questions prompt us to interpret the results with great caution, and we must consider these results as indicative of the direction and relative importance of different customs and administrative procedures on trade. The results do not provide evidence of the actual amount that will be gained from improved customs.

31. Nevertheless, we find evidence that improving the efficiency of NTMs such as customs and administrative procedures can facilitate trade. The statistical models, with their attendant simulations, show that all countries can benefit from more efficient customs and administrative procedures, with the greatest benefits accruing to those countries that seem to have less efficient customs and administrative procedures. To gain the greatest benefit from improving customs and administrative procedures, both trade partners need to make efforts, even if these efforts are not equivalent. Greater reductions are needed from those partners with less efficient customs and administrative procedures. The Brazilian examples provide evidence to support these claims. Lower income trading partners require greater reductions in the number of days to attain similar percentage increases in exports. The greatest benefits accrue from improving those procedures relevant for moving products that are most sensitive to cumbersome and long customs and administrative procedures. In the Portugal and Finland examples, we see that reducing the number of days by the 11.58 and 0.61 days would have generated the greatest gains. Additionally, depending on the cost of reduction, it would seem that reducing the number required documents or signatures generates greater benefits than similar reductions in the numbers of days. The results and

questions presented here suggest the need for further research, especially research that links these benefits to the cost of reducing the different metrics.

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APPENDIX 1. DETAILS OF THE WORLD BANK SURVEY "DOING BUSINESS"

For the sake of comparable data several assumptions were made in the World Bank survey about the business and the traded goods:

- The business
    - Has 100 or more employees.
    - Is located in the country's most populous city.
    - Is a private, limited liability company, formally registered and operating under commercial laws and regulations of the country. It does not operate within an export processing zone or an industrial estate with special export or import privileges.
    - Is domestically owned with no foreign ownership.
    - Exports more than 10% of its sales to international markets.
- The traded goods travel in a dry-cargo, 20-foot, full container load. The product
    - Is not hazardous nor does it include military arms or equipment.
    - Does not require refrigeration or any other special environment.
    - Does not require any special phytosanitary or environmental safety standards other than accepted international standards. The following Standard International Trade Classification (SITC) Revision 3 categories are considered by the respondents:
    - SITC 07: coffee, tea, cocoa, spices and manufactures thereof.
    - SITC 65: textile yarn, fabrics, made-up articles
    - SITC 84: articles of apparel and clothing accessories.

Source: World Bank (2005)

APPENDIX 2. THE MODEL SPECIFICATIONS

The Preliminary Model

In the preliminary models, we use the basic gravity model. The gravity model is broadly based on Newton's equation for gravity. The economic analogue is that the economic mass of the two countries, as measured by GDP, is hypothesised to have a positive influence on the bilateral trade between the countries. The distance between the countries, which represents travel costs, is hypothesised to have a negative effect on trade. From there, economists have added a number of other policy variables to explain further trade flows. In the preliminary model we have included indicator variables: *Common Language*; *Shared Colonial Link*, which indicates a shared coloniser; *Colonial History*, which indicates a coloniser and former colony; *Shared Border*; $Landlocked_{Exporter}$; $Landlocked_{Importer}$; and RTA indicators. Our concern is the effect of different measures of customs and administrative procedures on trade flows, so we incorporate the variables: $Days\ at\ the\ Border_{Importer}$, $Number\ of\ Signatures_{Importer}$ and $Number\ of\ Documents_{Importer}$. Because of the high correlation amongst these variables, we estimate separate equations for each of these variables. It should be noted that these variables are not bilateral that is we do not have the number of days for an importer to receive products for a particular exporter. The variables representing customs and administrative producers are averages over all exporters. They serve, at best, as proxies for actual values.

The dependant variable used in these equations and the ones that follow are bilateral trade of coffee, tea, cocoa, spices and manufactures thereof (SITC 07); textile yarn, fabrics, made-up articles (SITC 65); and articles of apparel and clothing accessories (SITC 84). We chose these products because the metrics of customs and administrative procedures were based on these products. The survey was conducted in 2004 so we only use data for that trade year. Even though we only have one year of data, the data are still in panels because of the different exporters, importers and products. Therefore, we use estimation techniques to manage panels. Following previous OECD studies (2005a and 2005d) and the work of Anderson and van Wincoop (2004), we use a fixed effects model. In this model we have indicator variables for exports, importers and products. We suppress the presentation of these variables in the Table A2.1.

The results of these preliminary regressions indicate that two of the three variables representing customs and administrative procedures are the right sign and statistically significant ($Days\ at\ the\ Border_{Importer}$ and $Number\ of\ Signatures_{Importer}$). In a random effects model, $Number\ of\ Documents_{Importer}$ was the right sign and statistically. Nevertheless because of the statistically insignificant coefficient in all of the fixed effects equations in Table A2.1 and those that follow, we exclude *Number of Documents* from further discussions.
Distance Adjusted for Time

As discussed in the paper, we construct a new variable for the distance because we feel that time at the border may have a substantial affect on the travel cost of products and can substantially affect trade costs. The new distance variable is the following:

$$Distance\,Weighted_{Exporter,\,Importer} = Distance_{Exporter,\,Importer} * \ln(Days\ at\ Border_{Exporter} * Days\ at\ Border_{Importer}) * Remoteness_{Exporter,\,Importer}.$$

The distance is "the geodesic distances following the great circle formula, which uses latitudes and longitudes of the most important cities/agglomerations, in terms of population" (Gaulier, Mayer and Zignago, 2004, p. 3). Additionally, we adjusted the distance by the remoteness, which Anderson and van Wincoop (2004) argue helps reduce bias in the estimation. The remoteness adjustment is based in part on Head (2003).

$$Remoteness_{Exporter,\,Importer} = \frac{1}{\frac{Distance_{Exporter,\,Importer1}}{GDP_{Importer1}} + \frac{Distance_{Exporter,\,Importer2}}{GDP_{Importer2}} + \ldots \frac{Distance_{Exporter,\,Importerj}}{GDP_{Importerj}}}$$

In the three equations in Table A2.2, we include a different measure of the customs and administrative procedure variables. We use the natural logarithm of product of the variables for the importer and the exporter. For *Number of Signatures*$_{Exporter}$* *Number of Signatures*$_{Importer}$ and *Number of Document*$_{Exporter}$* *Number of Documentss*$_{Importer}$, the elasticity is simply the coefficient from the regression. The elasticities are the same for the exporter and the importer. Because of the interaction between the variables for the distance and days at the border, the elasticity for *Days at the Border*$_{Exporter}$*Days at the *Border*$_{Importer}$ $\left(\varepsilon_{Days\ at\ Border,\ Exports}\right)$ for exporter and importer is the following:

$$\varepsilon_{Days\ at\ Border,\ Exports} = \frac{Coefficient\ of\ \ln(Distance\ Weighted)}{\ln\left(Days\ at\ Border_{Exporter} * Days\ at\ Border_{Importer}\right)} + Coefficient\ of\ \ln(Days\ at\ Border_{Exporter} * Days\ at\ Border_{Importer})$$

We use the estimated elasticity to calculate the necessary reduction in the number of days to achieve a 10% increase in trade. The percentage change in the number of days $\left(\hat{T}\right)$ to achieve the 10% increase in trade is $\hat{T} = \frac{-0.1}{\varepsilon_{Days\ at\ Border,\ Exports}}$. The *Days at Border* is the product of *Days at the Border*$_{Exporter}$ and *Days at the Border*$_{Importer}$. To attain the necessary reduction in the product of the days at the border, we assume that both factors are reduced by *z*, so that

$$\overline{Days\ at\ Border} = \left(Days\ at\ Border_{Exporter} z\right) * \left(Days\ at\ Border_{Importer} z\right).$$

If *z* equals one, then no reduction occurs. If *z* is between zero and one, then some or absolute reduction in the number of *Days at the Border* will occur. To obtain the appropriate factor *z*, we equate the following:

$$\overline{Days\ at\ Border} = \left(Days\ at\ Border_{Exporter} z\right) * \left(Days\ at\ Border_{Importer} z\right) = \left(1 + \hat{T}\right) Days\ at\ Border$$

$$= Days\ at\ Border_{Exporter} * Days\ at\ Border_{Importer} z^2 = \left(1 - \frac{0.10}{\varepsilon}\right) Days\ at\ Border$$

$$z^2 = \left(1 - \frac{0.10}{\varepsilon}\right)$$

$$z = \sqrt{\left(1 - \frac{0.10}{\varepsilon}\right)}.$$

By Product Group

In the third specification, we consider the effect of the different measures on each product. We constructed product specific variable by multiplying the product indicator variables with the different metrics of customs and administrative procedures. These new variables permit us to see how the different metrics affect each product differently. As seen in Table A2.3, many of the product specific variables are statistically significant suggesting that the products are affected differentially by the different metrics of customs and administrative procedures.

By Income Quartiles

In the final specification, we consider the sensitivity of levels of per capita income to the three metrics of customs and administrative procedures. We created a measure of income by summing the natural logarithms of the per capita GDPs for the trading pairs. We divided the trading pairs into quartiles. We then created a indicator variable for the quartiles and multiple the indicator variable with the different metrics. The results are presented in Table A2.4. All of the interacted metrics are statistically significant. When the elasticities and the number of days necessary to increase trade are calculated, the result is higher income partners would require less reform in their customs and administrative procedures.

Table A2.1 Preliminary Models of Customs Administration on Trade Flows

Dependent / Independent	ln(*Exports*) Fixed Effects	ln(*Exports*) Fixed Effects	ln(*Exports*) Fixed Effects
ln (*Days at the Border*$_{Importer}$)	**-0.63****		
	(0.19)		
ln (*Number of Signatures*$_{Importer}$)		**-0.99*****	
		(0.19)	
ln (*Number of Documents*$_{Importer}$)			**1.11*****
			(0.26)
ln (*GDP exporter*)	0.61**	0.61***	0.61***
	(0.015)	(0.015)	(0.015)
ln (*GDP importer*)	0.77***	0.47***	0.52***
	(0.064)	(0.078)	(0.10)
ln (*Distance*Remoteness*)	-1.35***	-1.35***	-1.35***
	(0.075)	(0.075)	(0.075)
Common Language	0.29**	0.29**	0.29**
	(0.11)	(0.11)	(0.11)
Shared Colonial Link	0.83***	0.83***	0.83***
	(0.17)	(0.17)	(0.17)
Colonial History	1.00***	1.00***	1.00***
	(0.14)	(0.14)	(0.14)
Shared Border	0.41***	0.41***	0.41***
	(0.15)	(0.15)	(0.15)
Member of NAFTA	1.019**	1.019**	1.019**
	(0.47)	(0.47)	(0.47)
Member of EBA	0.54	0.54	0.54
	(0.36)	(0.36)	(0.36)
Member of COMESA	0.48	0.48	0.48
	(0.40)	(0.40)	(0.40)
Member of EU	0.67***	0.67***	0.67***
	(0.18)	(0.18)	(0.18)
Member of ASEAN	-0.53	-0.53	-0.53
	(0.40)	(0.40)	(0.40)
Member of CARICOM	0.59	0.59	0.59
	(0.76)	(0.76)	(0.76)
Member of EFTA	0.59	0.59	0.59
	(0.36)	(0.36)	(0.36)
Member of ECOWAS	1.076	1.076	1.076
	(0.89)	(0.89)	(0.89)
Member of CAN	1.49***	1.49***	1.49***
	(0.26)	(0.26)	(0.26)
Member of MERCOSUR	0.71	0.71	0.71
	(0.51)	(0.51)	(0.51)
Member of CIS	1.92***	1.92***	1.92***
	(0.52)	(0.52)	(0.52)
Member of SADC	1.87***	1.87***	1.87***
	(0.67)	(0.67)	(0.67)
Member of GSP EU	-0.031	-0.031	-0.031
	(0.21)	(0.21)	(0.21)
Member of EURO MED	-0.13	-0.13	-0.13
	(0.26)	(0.26)	(0.26)
Member of AGOA	-1.18**	-1.18**	-1.18**
	(0.54)	(0.54)	(0.54)
Constant	-8.56	-1.11	-2.81
	(2.35)	(2.73)	(2.98)
R^2	0.58	0.58	0.58
n	16662	16662	16662

NB: Significance at 1% alpha level=***, at 5% alpha level=*** and at 10% alpha level=*. The standard errors are in parentheses below the estimated coefficient.

A2.2 Models of Customs Administration on Trade Flows

with Distance adjusted by time at the borders

Dependent / Independent	ln(*Exports*) Fixed Effects	ln(*Exports*) Fixed Effects	ln(*Exports*) Fixed Effects
ln (*Days at the Border$_{Exporter}$*Days at the Border$_{Importer}$*)	**-0.41****		
	(0.19)		
ln (*Number of Signatures$_{Exporter}$* Number of Signatures$_{Importer}$*)		**-0.88*****	
		(0.19)	
ln (*Number of Document$_{Exporter}$* Number of Documentss$_{Importer}$*)			**-0.96****
			(0.38)
ln (*GDP exporter*)	0.50**	0.38***	0.54***
	(0.038)	(0.044)	(0.017)
ln (*GDP importer*)	0.77***	0.47***	0.48***
	(0.063)	(0.078)	(0.12)
ln (*Distance Weighted*)	-1.35***	-1.35***	-1.35***
	(0.076)	(0.076)	(0.076)
Common Language	0.29**	0.29**	0.29**
	(0.12)	(0.12)	(0.12)
Shared Colonial Link	0.84***	0.84***	0.84***
	(0.18)	(0.18)	(0.18)
Colonial History	1.014***	1.014***	1.014***
	(0.15)	(0.15)	(0.15)
Shared Border	0.41***	0.41***	0.41***
	(0.15)	(0.15)	(0.15)
Constant	-2.82	8.68**	3.45
	(3.33)	(3.89)	(4.29)
R^2	0.58	0.58	0.58
n	16424	16424	16424

NB: Significance at 1% alpha level=***, at 5% alpha level=*** and at 10% alpha level=*. The standard errors are in parentheses below the estimated coefficient.

A2.3 Models of Customs Administration on Trade Flows

with Distance weighted by time variables and product specific effects

Dependent / Independent	ln(*Exports*) Fixed Effects	ln(*Exports*) Fixed Effects	ln(*Exports*) Fixed Effects
ln (*Days at the Border for Coffee, Tea and Spices*)	**-0.52*****		
	(0.19)		
ln (*Days at the Border for Yarn and Fabric*)	**-0.32***		
	(0.19)		
ln (*Days at the Border for Clothing and Accessories*)	**-0.44****		
	(0.19)		
ln (*Number of Signatures for Coffee, Tea and Spices*)		**-1.034*****	
		(0.20)	
ln (*Number of Signatures for Yarn and Fabric*)		**-0.74*****	
		(0.19)	
ln (*Number of Signatures for Clothing and Accessories*)		**-0.94*****	
		(0.19)	
ln (*Number of Documents for Coffee, Tea and Spices*)			**-1.14*****
			(0.38)
ln (*Number of Documents for Yarn and Fabric*)			**-0.83****
			(0.38)
ln (*Number of Documents for Clothing and Accessories*)			**-1.013*****
			(0.38)
ln (*GDP exporter*)	0.49***	0.38***	0.54***
	(0.038)	(0.044)	(0.017)
ln (*GDP importer*)	0.77***	0.47***	0.47***
	(0.064)	(0.076)	(0.12)
ln (*Distance Weighted*)	-1.34***	-1.34***	-1.34***
	(0.075)	(0.075)	(0.075)
Common Language	0.29**	0.29**	0.29**
	(0.12)	(0.11)	(0.12)
Shared Colonial Link	0.83***	0.82***	0.83***
	(0.18)	(0.18)	(0.18)
Colonial History	1.0091***	1.0074***	1.011***
	(0.15)	(0.15)	(0.15)
Shared Border	0.42***	0.42***	0.41***
	(0.15)	(0.15)	(0.15)
Constant	-2.025	9.44**	4.38
	(3.25)	(3.79)	(4.28)
R^2	0.58	0.58	0.58
N	16424	16424	16424

NB: Significance at 1% alpha level=***, at 5% alpha level=*** and at 10% alpha level=*. The standard errors are in parentheses below the estimated coefficient.

A2.4 Modes of Customs Administration on Trade Flows

with income quartiles and distance adjusted by time at the borders

Dependent Independent	ln(*Exports*) Fixed Effects	ln(*Exports*) Fixed Effects	ln(*Exports*) Fixed Effects
ln (*Days at the Border*$_{Exporter}$* *Days at the Border*$_{Importer}$)*Income1	**-0.40**** **(0.18)**		
ln (*Days at the Border*$_{Exporter}$* *Days at the Border*$_{Importer}$)*Income2	**-0.42**** **(0.19)**		
ln (*Days at the Border*$_{Exporter}$* *Days at the Border*$_{Importer}$)*Income3	**-0.40**** **(0.19)**		
ln (*Days at the Border*$_{Exporter}$* *Days at the Border*$_{Importer}$)*Income4	**-0.40**** **(0.19)**		
ln (*Number of Signatures*$_{Exporter}$* *Number of Signatures*$_{Importer}$)*Income1		**-0.87***** **(0.19)**	
ln (*Number of Signatures*$_{Exporter}$* *Number of Signatures*$_{Importer}$)*Income2		**-0.91***** **(0.19)**	
ln (*Number of Signatures*$_{Exporter}$* *Number of Signatures*$_{Importer}$)*Income3		**-0.90***** **(0.19)**	
ln (*Number of Signatures*$_{Exporter}$* *Number of Signatures*$_{Importer}$)*Income4		**-0.91**** **(0.19)**	
ln (*Number of Document*$_{Exporter}$* *Number of Documentss*$_{Importer}$)*Income1			**-0.93**** **(0.38)**
ln (*Number of Document*$_{Exporter}$* *Number of Documentss*$_{Importer}$)*Income2			**-0.95**** **(0.37)**
ln (*Number of Document*$_{Exporter}$* *Number of Documentss*$_{Importer}$)*Income3			**-0.92**** **(0.38)**
ln (*Number of Document*$_{Exporter}$* *Number of Documentss*$_{Importer}$)*Income4			**-0.91**** **(0.38)**
ln (*GDP exporter*)	0.50*** (0.041)	0.39*** (0.045)	0.53*** (0.022)
ln (*GDP importer*)	0.77*** (0.063)	0.46*** (0.077)	0.47*** (0.12)
ln (*Distance Weighted*)	-1.35*** (0.075)	-1.35*** (0.075)	-1.35*** (0.076)
Common Language	0.29** (0.12)	0.30** (0.11)	0.30*** (0.11)
Shared Colonial Link	0.84*** (0.18)	0.83*** (0.18)	0.82*** (0.18)
Colonial History	1.014*** (0.15)	1.015*** (0.15)	1.018*** (0.15)
Shared Border	0.41*** (0.15)	0.40*** (0.15)	0.41*** (0.15)
Constant	-2.84 (3.33)	8.63** (3.87)	3.74 (4.29)
R^2	0.58	0.58	0.58
n	16424	16424	16424