UCD CENTRE FOR ECONOMIC RESEARCH

WORKING PAPER SERIES

2017

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WP17/03

January 2017

UCD SCHOOL OF ECONOMICS
UNIVERSITY COLLEGE DUBLIN
BELFIELD DUBLIN 4

The Infant Industry Argument:Tariffs, NTMs and Innovation*

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January 30, 2017

Abstract

One rationale for the infant industry argument is that, by protecting domestic firms from foreign competition, this increases rents and investment in innovation and other growth enhancing measures. Using data on 4,750 firms across 13 developing countries, we examine whether protection via tariffs or non-tariff measures (SPS and TBT specifically) increase innovation in either products or processes. We find no such evidence; instead we find a small negative impact of protection, particularly tariffs and TBTs, on innovation.

JEL classification: F13, H57, F12

Keywords: Non-Tariff Measures; Technical Barriers to Trade; Innovation; Infant Industry.

*We thank Madhi Ghodsi, Oliver Rieter, and Robert Stehrer for kindly providing the NTM data. This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 613504. All errors are our own.

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1 Introduction

The infant industry argument (IIA) in favor of trade protection is built upon the notion that by reducing import competition, a domestic industry can grow to achieve sufficient productivity so as to profitably operate without continued protection. As discussed by Slaughter (2004), this growth can result from returns to scale (i.e. when average costs are declining in output), reduced competition (which generates profits, permitting the firm to invest in profit-enhancing investments), and/or learning by doing. In particular, this argument has been used to support maintainable of trade barriers in developing countries where firms are arguably clearly behind the productivity frontier compared to their developed country counterparts. Although intuitively appealing, the literature has shown that the theoretical support for the IIA is perhaps best described as qualified, relying on many assumptions regarding market structure, technology, and political economy (Tybout, 2000). Furthermore, the bulk of the empirical evidence indicates a failure of the IIA to achieve its productivity enhancing goals. For example, there is evidence that tariffs increase the rents enjoyed by protected firms, these do not seem to translate into increased investment or productivity gains.[1] Furthermore, there is a good deal of evidence that, as would be anticipated using a Melitz (2003) model of heterogenous firms, protection lowers average firm productivity.[2]

In this paper, we build on the existing literature by analyzing how protection affects a firm's choice to innovate, a key feature of the reduced competition justification for the IIA. Specifically, we use 2005 World Bank data on 4,750 firms across 13 developing countries and examine how their choice to undertake two types of innovation – product (where the firm introduces a new or improved product) and process (where the firm introduces a new technology or production method) – is affected by its country's protection in its main product. In particular, we consider three types of protection: tariffs, sanitary and phytosanitary standards (SPSs), and technical barriers to trade (TBTs). We do so for two reasons. First,

[1] Tybout (2000) provides a large literature review.

[2] See Roberts and Tybout (1997) for a survey of this work.

while average tariffs have declined over time, there has been remarkable growth in the use of non-tariff measures (NTMs) including SPSs and TBTs. Given these policy shifts, it is important to understand the potentially different impacts these have on innovation and therefore on the support for the IIA. Such a possibility is particularly relevant given the work of the World Bank (1997), Edwards (1998), and Kim (2000), all of whom find that quotas (one type of NTM) tend to lower productivity more than do tariffs. Second, whereas tariffs are explicitly protectionist, SPSs and TBTs are often geared towards reallocating production towards safer, better products, i.e. they may have non-protectionist goals at their heart. This is particularly relevant for innovation since in order for domestic firms to meet non-discriminatory NTMs, they may be required to alter their product mix and/or production processes, i.e. to innovate.

Theoretically, it is not clear what effect such protection should have on innovation. On the one hand, the pro-IIA argument would argue that by generating additional rents for domestic firms, protected industries should have deeper pockets and be more able to innovate. On the other, without the need to compete against innovating imports, domestic innovation rates may find it less necessary to innovate themselves, evidence of which can be found in Bertschek (1995).[3] Across a variety of robustness checks, our results find no evidence for a pro-innovation impact of protection. Instead, we find that TBTs tend to reduce product innovation whereas SPSs have no effect on either product or process innovation. Tariffs, on the other hand, tend to lower both types of innovation. All of these effects, however, are economically small. In any case, our evidence is in line with the existing work suggesting that the IIA is unlikely to be an effective strategy for improving growth in developing countries.

In section 2, we discuss our data and empirical approach. Section 3 presents our results, including our various robustness checks. Section 4 concludes.

[3]Although our data is cross-sectional and we therefore cannot discuss dynamic changes from protection, the Melitz (2003) model would suggest that protection would permit the survival of low-productivity firms. This provides another argument against using trade policy to enhance domestic productivity.

2 Data and Empirical Approach

In this section, we describe our data and empirical approach. In particular, we devote attention to the various measures of NTMs.

2.1 Firm Level Data

Our unit of observation is an individual firm where the data comes from the World Enterprise Survey (World Bank, 2015). These surveys are repeated cross-sections, with different countries being covered in different years. For our purposes, we are only able to use the surveys carried out in 2005 because for that year only, two questions on innovation were asked of firms. The first of these asked whether the firm "introduced new or significantly improved products or services" in the past year (question e7 on the survey). This was used to construct a dummy variable called *Product Innovation* if the firm answered this question in the affirmative. In addition, the survey asked whether the firm had "introduced any new or significantly improved production processes" (question e8). This was used to create a dummy variable *Process Innovation* equal to one if the firm answered yes.[4]

In addition to this information, the surveys provide a variety of other information about the firm that we make use of. Specifically, we control for the size of the firm (*Size* measured as the log of the number of full time employees), labour productivity (*Productivity* measured as the log of sales per employee), and the logged age of the firm (*Age*). In addition, we control for several dummy variables indicating whether the firm has an international quality certificate (*Quality*), exports (*Exporter*), imports intermediate inputs (*Importer*), is a multi-product firm (*Multi*), licenses a foreign technology (*License*), and/or has at least a 10% foreign-ownership share (i.e. whether it would be classified as a foreign-controlled firm, *Foreign*). For all of these, the relevant variable equals one if the description applies to the firm and zero otherwise. We chose this set of control variables due to their use in other studies of

[4]Note that for both of these, some firms were listed as no response and others had missing values. We do not use these observations.

firm behaviour (e.g. Davies and Jeppesen, 2015). In addition, Becker and Egger (2013) find that product innovation is linked to export propensity with a weaker relationship in process innovation. Finally, the surveys report the firms ISIC Rev3.1 classification for itself at the two digit level and the four digit classification for its main product. We restrict ourselves to firms in manufacturing, that is those with ISIC codes between 15 and 37 inclusive. Note that it is nevertheless possible that these firm's main products may fall outside this range.

2.1.1 NTMs and Tariffs

The measurement of NTMs is notoriously challenging due to the myriad of policies that can be classified as NTMs and their often non-quantifiable nature. As an example of the challenges posed by the first of these is the issue of whether a policy should be classified as an NTM if it affects trade (such as a safety regulation that applies to domestic- and foreign-produced products alike) or only if its primary purpose is to impact trade (i.e. it is discriminatory such as an anti-dumping duty). Even setting this issue aside, while some NTMs such as quantity restrictions are quantifiable, others such as technical barriers are not. Thus, using dummy variable indicators for the presence of an NTM can miss important variation in the severity of the NTM and therefore its impact on economic behaviour. Finally, as discussed by Bagayev and Davies (2017), when aggregating NTM data, the aggregation process itself can affect the predicted effect of the NTM.

With this in mind, we utilize five different NTM measures in our analysis in order to gauge the sensitivity of our findings to different measurements. Two of these begin with six digit NTM notifications made to the WTO and compiled by Ghodsi, Reiter, and Stehrer (2015).[5] At the six digit level, we therefore know whether a country has notified the WTO about its use of an NTM and the number of such NTMs. We acknowledge that this measure is imperfect for two reasons: it relies on self-notification and these are measures that apply to imports of the product from all sources (i.e. is a worldwide NTM and excludes those that apply

[5]See Ghodsi, M., J. Gruebler, and R. Stehrer (2016a), Ghodsi, M., J. Gruebler, and R. Stehrer (2016b), or Disdier, Fontagne, and Mimouni (2008) for examples working with such data.

only to some trade partners, e.g. antidumping duties). Therefore we proceed acknowledging these caveats.[6] It should be noted because we utilize those that apply on a worldwide basis, most of these notifications would fall under either sanitary and phytosanitary measures or technical barriers to trade (Chapter B).

From this, in order to match our four digit product level for the firm's main product, we can proceed in two ways. The first is to construct the *NTM Average*, that is, the average number of NTMs across the six digit products in a four digit category. We do this for 2004 and 2005 since the year of the survey is 2005 but the question applies to the firm's activities in the prior year. Note that endogeneity in the NTM variable are potentially reduced as we find it unlikely that government policy is based on the innovation decision of a single firm.

A downside of the NTM average is that it assumes that each six digit product is equally important in constructing the NTM measure. An alternative is the *NTM Coverage* which is the import share-weighted average of the number of NTMs across the six digit products within the four digit category. For this, we are forced to use the information for 2008, which is the only year for which six-digit import information was available to us. In order to aid in comparison, we also construct NTM averages for 2008.

Finally, all of these measures do not account for the severity of the NTM, i.e. its impact on trade. Therefore as a final measure we use the *NTM Equivalence* which is the ad valorem tariff equivalence constructed by Kee, et. al (2008, 2009). As with the NTM coverage this is for a later year than our innovation data and we therefore face a tradeoff between having an arguably better measure of NTMs and a less applicable time frame.

In addition to issues regarding the measurement of NTMs in a sector, there is a possibility that different NTMs may have different effects. For example, some may be solely protectionist whereas others may require innovation if a firm is going to meet the standards the policy lays out. With that in mind, we use two measures of NTMs, SPSs (Chapter A

[6]The self-reporting issue can be mitigated somewhat by including trade concerns from the WTO, i.e. an exporter raising concerns with the WTO about the use of an NTM by a given importer. We do not make use of these in our data for two reasons. First, there are very few in our set of countries. Second, just as not all NTMs will be notified by the importer, not all concerns by exporters are valid.

of the UNCTAD classification, UNCTAD (2015)) and TBTs (Chapter B), where for each of these within a given specification we apply one of the five construction methods. We have no *a priori* assumptions on which should have a larger effect on innovation.

As an alternative measure of protection, we use two measures of a country's tariffs on a four digit product. The first is the average across six digit product codes, i.e. comparable to our NTM average variable. When using the 2004 NTM average, we use the 2004 average tariff. For other specifications, we use the 2005 average tariff with one exception; when we use NTM coverages, we use the trade-weighted average in 2005 to better match the NTM measure. These data come from the World Bank's WITS database (World Bank, 2016).

One final note is that these data are often plagued with missing information. In particular, WTO notifications are exactly that – a notification that a NTM is in place. If there is nothing reported, this could be that there are no NTMs or an indication that the country does not feel compelled to notify the WTO of a policy that could be considered as an NTM because there is no trade. In the first case, the data should clearly be coded as "no NTM". In the second, however, it very much depends on why there is no trade. If this is because the product is simply not traded (due to high shipping costs or price for example), in one sense one could again code the data as "no NTM" since the NTM does not affect trade. However, if the reason that there is no trade is that the NTM is prohibitive, this would be inaccurate. Unfortunately, in the data, we have no way of knowing which of these is in fact the case. Therefore, we have assumed that no notification implies no NTM while being aware of the potential inaccuracies this can cause. Put differently, our NTM measure potentially reports less restrictive policies than are actually applied. Thus, while we are burdened by the same data shortcomings faced by the rest of the literature, we nevertheless proceed with our analysis bearing such concerns in mind. Beyond this, not all NTM measures are available for a given country-sector. Rather than introduce variation in the sample used across these measures, we restrict our sample to those where all variables are available for

all specifications.[7]

Table 1 presents the countries in our sample, including the number of firms in our data and the percentage of firms undertaking the two forms of innovation. In particular note that Mexico makes up roughly 25% of the sample and has lower innovation rates. That nation aside, innovation rates of both types are roughly similar across countries, although Uganda does have a somewhat lower process innovation rate. Table 2 reports the number of firms in each of our two digit sectors. There is significant variation across sectors. Apparel has the highest innovation rate of both types. At the other end of the scale, Communications Equipment has the lowest product innovation rate and, although it is also low in process innovation, Motor Vehicles and Furniture both have lower process innovation rates. Table 3 presents our summary statistics.

2.2 Regression Specification

Our baseline specification for firm i from country c in two-digit sector s producing a product p as its main product is:

$$\begin{aligned} Innovation_i = f(&NTM_{p,c}, Productivity_i, Size_i, Age_i, Quality_i, Exporter_i, Importer_i, \\ &Multi_i, License_i, Foreign_i, \beta_c, \beta_s) + \varepsilon_i \end{aligned} \tag{1}$$

where $Innovation$ is either product or process innovation, $NTM_{p,c}$ is one of the above discussed NTM measures, the βs are dummy variables for country (c) and sector (s), and ε_i is the error term. This is then modified by interacting the NTM measure with firm characteristics in order to explore heterogenous innovation responses under NTMs.

Given the dichotomous nature of our dependent variable, we use three estimators. First, we use the logit estimator where, since the firm either does or does not innovate the issue

[7]When not doing so, we find largely similar results although the significance of the tariff measures are somewhat lower. These results are available on request.

of irrelevant alternatives does not arise. Second, we use the probit estimator. The reason that this is not our baseline estimator is that, as discussed by Greene (2004), the inclusion of too many dummy variables can bias the estimates. Finally, since both of these non-linear estimators make interpretation of magnitudes and interaction effects difficult, we use a linear probability model despite its failure to restrict the estimated probability to the unit interval. In each case, we cluster our errors at the country-sector level.

3 Results

3.1 Product Innovation

In Tables 4, 5, and 6, we estimate the probability of a firm undertaking a product innovation using logit, probit, and OLS respectively. As can be seen, the overall picture is consistent across the different estimation methodologies. Beginning with the firm-level controls, regardless of how we measure the protection in the firm's main product, we find that productivity, firm age, and exporting have no significant impact on product innovation. However, larger firms are more likely to introduce a new product. Similarly, importers and firms that license a foreign technology are more likely to product innovate.[8] Unsurprisingly, multi-product firms are more likely to introduce a new product. In unreported results, we omitted the multi-product dummy out of concern that it might be endogenous; this had no impact on our results. While firms with a quality certificate are also more likely to innovate, the significance of this relationship is somewhat tenuous. Foreign-owned firms are found to be significantly less likely to undertake product innovation than their domestically-owned counterparts.

Turning to our protection measures, we see evidence that although the sign of the estimated effect remains consistent across columns, the choice of year seems to have a large

[8]In unreported results, we omitted the *License* variable since one might worry that it is endogenous, i.e. firms planning to introduce a new product license a foreign technology in order to produce it. This increased significance of the *Quality* coefficient but had no other meaningful effects.

impact on their significance with significant coefficients primarily when we use their 2004 and 2005 values, i.e. those most relevant to the year of the survey. On the whole, we find limited evidence of impacts from SPSs, with a significant coefficient only in column (1) where we use the 2004 protection measures. It turns out, however, that if we omit the 5 observations in Peru's most protected product (where the SPS measures is the maximum in the sample), this alone is sufficient to eliminate significance of the SPS measure. For the TBT measure, we only find significance when using the 2004 or 2005 values, but not when using the 2008 average or coverage measures.[9] Thus, this points to the importance of roughly contemporary TBTs in the innovation decision. However, it should be noted that this effect is rather small; at the marginal effect under logit is just -0.008. Using the linear estimates where interpretation is most straightforward, one additional TBT reduces the probability of product innovation by 0.006 (Table 6, column (2)), or relative to the sample mean, a reduction in the probability of .001 percentage point, i.e. a .1% fall in the probability.

Tariffs seem to matter, but only when using the 2005 measure, with little difference between using the average tariff or the trade-weighted tariff in column (4). The size of this effect is, however, even smaller than that of TBTs. Finally, when using the 2008 ad valorem equivalence of the NTMs, as with the other 2008 measures of these variables, we find no significant effect.

In summary, we find a small anti-innovation effect from protection via TBTs in the years surrounding the survey and for tariffs in the year of the survey, with no robust effect from SPSs. These results run counter to the pro-IIA arguments in which restricting imports shelters domestic industry, allowing them the needed space to grow and become competitive. Instead, at least for TBTs and tariffs, it suggests that by limiting competition from potentially more innovative imports, domestic firms feel less pressure to innovate themselves.

[9]This is true even when omitting the extreme Peruvian observations.

3.2 Process Innovation

In Tables 7, 8, and 9, we again use logit, probit, and OLS respectively but now do so to estimate the probability that a firm undertakes a process innovation. Again, we see that the results are similar regardless of which estimation method we use. Once again starting with the control variables, we find that much like with product innovation, larger firms are more likely to innovate. In addition, firms that are domestic, import, license a foreign technology, and have a quality certificate are more likely to process innovate (with this last effect more significant than before).[10] In contrast to the product estimates, however, we find that exporters are more likely to innovate whereas multi-product firms are no different from their single product counterparts.

Also different from the product innovation results, we find no evidence that NTMs, be they SPSs or TBTs, have an impact on innovation. However, we continue to find a significantly negative impact of tariff protection which, although significant for the 2004 estimates as well, is now marginally significant. Furthermore, as in the product innovation results, the size of this coefficient indicates an effect that is rather small. Therefore, although we find some evidence that tariffs may impede innovation, this effect is of small importance. Thus, in contrast to the product innovation results, we find no evidence indicative of the pro-IIA or anti-IIA arguments.

3.3 The Impact of Mexico

Since as noted above Mexico makes up a quarter of the sample and has much lower reported innovation rates, in Table 10 we exclude this country and estimate the logit specification using the 2005 averages for the NTMs and tariff.[11] As can be seen, although we maintain the same sign on our coefficients, their significance falls as the number of observations declines.

[10] In unreported results, we omitted *License* out of concerns that it may be endogenous with the process innovation coming because the firm may have access to (superior) foreign technology. This had no impact on our results.

[11] Results are comparable for probit and OLS, the results of which are omitted for brevity.s

Nevertheless, we continue to find that firms protected by TBTs tend to have lower product innovation rates.

3.4 Heterogenous Responses

In Tables 11 and 12 we explore the data further by looking for heterogenous effects of protection across different firms' innovations by interacting the protection variables with each of our control variables in turn (with column (1) doing so for productivity, column (2) doing so for age, etc.). In each, we present only the logit results (with comparable results found when using probit or OLS) and use the 2005 averages for our protection variables (column (2) of the preceding tables). As can be seen in Table 11, across the bulk of the specifications, we again find a negative impact of TBTs and tariffs on innovation. That said, we find little in the interactions with the sole significant coefficient suggesting that TBTs lower innovation less in exporting firms than in non-exporters.

In the process innovation results of table 12 we again find a negative effect from tariffs. Unlike the baseline results, we also find two positive and significant coefficients for TBTs. None of our interaction effects are significant. Thus, these results find little in the way of heterogenous effects for the control variables we use.

As a final check, in Table 13 we interact the average years of schooling for those 25 and over from Barro and Lee (2013) with our three protection measures (note that the uninteracted education effect is captured by the country dummies). We do so to investigate whether the innovation impact of protection differs in relatively skill-abundant developing countries. This might be the case if in these countries, due to the availability of skill used to innovate, the extra rents caused by protection allows firms to innovate more easily than in nations without such workers. Nevertheless, as the results indicate, we find no such effect.

4 Conclusion

The goal of this paper has been to ask whether protection by tariffs or NTMs has an impact on innovation by protected firms. In short, we find no positive effect and, if anything, a small negative impact. This argues against the reduced competition motive for the infant industry argument as a method of encouraging innovation and growth.[12]

[12]Note that other interpretations, such as the counter-selection the Melitz (2003) would predict, can also yield a negative relationship between protection and average sector productivity.

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Table 1: Countries in Sample

Country	Obs.	Product Innovation	Process Innovation
Argentina	502	77.5	69.5
Bolivia	131	69.5	77.9
Chile	478	69.2	67.4
Colombia	504	71.2	68.1
El Salvador	398	70.9	67.6
Guatemala	310	74.8	71.3
Honduras	219	75.3	77.6
Mexico	1,024	27.5	27
Nicaragua	292	50.3	59.2
Paraguay	237	68.8	61.2
Peru	340	77.9	75.1
Uganda	169	63.9	56.8
Uruguay	146	74.7	67.8

Notes: Product and process innovation indicate the percentage of a country's firms that indicate the relevant innovation.

Table 2: Sectors in Sample

Sector	Obs.	Product Innovation	Process Innovation
Food Products and Beverages	1,323	64.6	64.4
Tobacco	3	63.9	59.7
Textiles	380	51.3	49.1
Apparel	1,064	81.8	74.4
Leather Products	44	75.4	72.3
Wood Products	76	62.1	59.5
Paper and Paper Products	11	60.5	56.8
Publishing and Printing	6	68.2	59.1
Basic Chemicals	643	48.1	45.4
Rubber and Plastic Products	154	62.2	75.6
Glass and Glass Products	293	53.9	61.8
Iron and Steel	45	73.8	72.3
Fabricated Metal	232	70	70
Machinery and Equipment	281	50	50
Electrical Machinery	75	58.7	54.7
Communication Equipment	36	41.7	36.1
Medical Equipment and Clocks	9	54.5	18.2
Motor Vehicles	10	55.6	55.6
Furniture	65	66.7	33.3

Notes: Product and process innovation indicate the percentage of a two-digit sectors's firms that indicate the relevant innovation.

Table 3: Summary Statistics

	Obs.	Mean	Std. Dev.	Min	Max
Product Innovation	4750	0.6153684	0.4865593	0	1
Process Innovation	4745	0.5936776	0.4911979	0	1
Productivity	4750	9.666629	1.41562	3.359647	17.5871
Age	4750	2.811754	0.827771	0	5.147494
Size	4750	3.384307	1.348651	0	9.798127
Exporter	4750	0.3151579	0.4646276	0	1
Importer	4750	0.3282105	0.4696113	0	1
Foreign	4750	0.0907368	0.2872648	0	1
Multi	4750	0.5402105	0.498433	0	1
License	4750	0.128	0.334125	0	1
Quality	4750	0.1867368	0.3897412	0	1
SPS (2004)	4750	0.5060567	1.31436	0	12.125
TBT (2004)	4750	1.529537	3.20925	0	26
SPS (2005)	4750	0.6092767	1.473044	0	13.34722
TBT (2005)	4750	1.735223	3.597961	0	28
SPS (2008)	4750	0.900667	2.188309	0	21.08974
TBT (2008)	4750	2.844778	4.895058	0	38.71429
SPS Coverage (2008)	4750	0.02553	0.0664226	0	0.5
TBT Coverage (2008)	4750	0.0433438	0.0777465	0	1
Ad Valorem (2008)	4750	0.1883461	0.2105041	0	1.004059
Tariff (2004)	4750	21.0072	13.57592	0	128.08
Tariff (2005)	4750	21.58096	14.7746	0	129.08
Weighted Tariff (2005)	4750	20.92017	15.60121	0	136.38

Table 4: Product Innovation: Logit Estimates

	(1)	(2)	(3)	(4)	(5)
NTM Measure=	2004 Average	2005 Average	2008 Average	2008 Coverage	Ad Valorum
SPS	0.0611*	0.0317	0.0328	0.916	
	(0.0354)	(0.0316)	(0.0221)	(0.755)	
TBT	-0.0242**	-0.0330***	-0.00929	-0.305	
	(0.0115)	(0.0112)	(0.0103)	(0.779)	
Tariff	-0.00173	-0.00802***	-0.00800***	-0.00770***	-0.00756***
	(0.00336)	(0.00249)	(0.00256)	(0.00240)	(0.00258)
AVE					-0.107
					(0.360)
Productivity	-0.0108	-0.0114	-0.00861	-0.00564	-0.00580
	(0.0426)	(0.0428)	(0.0429)	(0.0432)	(0.0428)
Age	0.0279	0.0271	0.0262	0.0273	0.0255
	(0.0610)	(0.0609)	(0.0611)	(0.0612)	(0.0607)
Size	0.252***	0.256***	0.255***	0.259***	0.257***
	(0.0563)	(0.0566)	(0.0565)	(0.0558)	(0.0560)
Exporter	0.197	0.196	0.189	0.182	0.178
	(0.139)	(0.137)	(0.137)	(0.135)	(0.134)
Importer	0.460***	0.465***	0.466***	0.468***	0.469***
	(0.113)	(0.113)	(0.113)	(0.113)	(0.113)
Foreign	-0.466**	-0.474**	-0.477**	-0.487***	-0.473**
	(0.187)	(0.188)	(0.187)	(0.187)	(0.187)
Multi	0.387***	0.384***	0.386***	0.392***	0.393***
	(0.110)	(0.110)	(0.110)	(0.108)	(0.108)
License	0.758***	0.753***	0.754***	0.763***	0.753***
	(0.186)	(0.186)	(0.185)	(0.188)	(0.186)
Quality	0.258*	0.264*	0.258*	0.249*	0.249*
	(0.151)	(0.150)	(0.150)	(0.150)	(0.151)
Constant	-0.255	0.0574	-0.190	-0.339	-0.236
	(0.454)	(0.454)	(0.486)	(0.509)	(0.498)
Observations	4,750	4,750	4,750	4,750	4,750
Pseudo R-squared	0.189	0.190	0.190	0.190	0.189

Notes: ***, **, and * on coefficients denote significance at the 1%, 5%, and 10% levels respectively. Robust standard errors clustered by country-sector in parentheses. All specifications include country and 2-digit sector dummies.

Table 5: Product Innovation: Probit Estimates

	(1)	(2)	(3)	(4)	(5)
NTM Measure=	2004 Average	2005 Average	2008 Average	2008 Coverage	Ad Valorum
SPS	0.0349*	0.0182	0.0184	0.599	
	(0.0203)	(0.0181)	(0.0125)	(0.445)	
TBT	-0.0140*	-0.0191***	-0.00469	-0.221	
	(0.00735)	(0.00706)	(0.00638)	(0.469)	
Tariff	-0.00123	-0.00473***	-0.00473***	-0.00455***	-0.00451***
	(0.00206)	(0.00151)	(0.00155)	(0.00146)	(0.00158)
Ad Valorum Equiv.					-0.0765
					(0.217)
Productivity	-0.00813	-0.00818	-0.00651	-0.00491	-0.00496
	(0.0251)	(0.0251)	(0.0252)	(0.0254)	(0.0252)
Age	0.0155	0.0148	0.0144	0.0150	0.0138
	(0.0361)	(0.0360)	(0.0361)	(0.0362)	(0.0358)
Size	0.148***	0.150***	0.149***	0.151***	0.151***
	(0.0329)	(0.0330)	(0.0329)	(0.0324)	(0.0325)
Exporter	0.121	0.119	0.115	0.112	0.109
	(0.0805)	(0.0796)	(0.0793)	(0.0788)	(0.0780)
Importer	0.267***	0.268***	0.270***	0.270***	0.271***
	(0.0655)	(0.0654)	(0.0655)	(0.0650)	(0.0650)
Foreign	-0.286***	-0.291***	-0.291***	-0.297***	-0.288***
	(0.106)	(0.107)	(0.106)	(0.106)	(0.107)
Multi	0.231***	0.229***	0.231***	0.234***	0.235***
	(0.0655)	(0.0649)	(0.0649)	(0.0638)	(0.0640)
License	0.439***	0.436***	0.435***	0.440***	0.434***
	(0.100)	(0.101)	(0.100)	(0.101)	(0.100)
Quality	0.146*	0.150*	0.147*	0.141*	0.143*
	(0.0864)	(0.0855)	(0.0854)	(0.0849)	(0.0858)
Constant	-0.113	0.0612	-0.0900	-0.167	-0.101
	(0.274)	(0.274)	(0.292)	(0.298)	(0.291)
Observations	4,750	4,750	4,750	4,750	4,750
Pseudo R-squared	0.188	0.190	0.189	0.189	0.189

Notes: ***, **, and * on coefficients denote significance at the 1%, 5%, and 10% levels respectively. Robust standard errors clustered by country-sector in parentheses. All specifications include country and 2-digit sector dummies.

Table 6: Product Innovation: Linear Probability Estimates

	(1)	(2)	(3)	(4)	(5)
NTM Measure=	2004 Average	2005 Average	2008 Average	2008 Coverage	Ad Valorum
SPS	0.0104*	0.00511	0.00559	0.159	
	(0.00609)	(0.00549)	(0.00396)	(0.135)	
TBT	-0.00439*	-0.00595**	-0.00133	-0.0581	
	(0.00234)	(0.00228)	(0.00203)	(0.150)	
Tariff	-0.000423	-0.00149***	-0.00148***	-0.00145***	-0.00142***
	(0.000660)	(0.000490)	(0.000504)	(0.000467)	(0.000505)
Ad Valorum Equiv.					-0.0244
					(0.0707)
Productivity	-0.00132	-0.00121	-0.000799	-0.000290	-0.000257
	(0.00812)	(0.00812)	(0.00814)	(0.00816)	(0.00812)
Age	0.00409	0.00397	0.00383	0.00395	0.00366
	(0.0118)	(0.0118)	(0.0118)	(0.0118)	(0.0118)
Size	0.0445***	0.0452***	0.0448***	0.0453***	0.0451***
	(0.0101)	(0.0101)	(0.0101)	(0.00991)	(0.00992)
Exporter	0.0372	0.0368	0.0355	0.0342	0.0335
	(0.0251)	(0.0247)	(0.0247)	(0.0245)	(0.0243)
Importer	0.0819***	0.0819***	0.0829***	0.0830***	0.0833***
	(0.0208)	(0.0207)	(0.0208)	(0.0207)	(0.0206)
Foreign	-0.0747**	-0.0753**	-0.0757**	-0.0774**	-0.0750**
	(0.0309)	(0.0308)	(0.0307)	(0.0308)	(0.0308)
Multi	0.0727***	0.0720***	0.0724***	0.0732***	0.0736***
	(0.0198)	(0.0195)	(0.0195)	(0.0192)	(0.0193)
License	0.114***	0.112***	0.112***	0.113***	0.112***
	(0.0279)	(0.0281)	(0.0280)	(0.0284)	(0.0281)
Quality	0.0365	0.0370	0.0359	0.0348	0.0348
	(0.0240)	(0.0237)	(0.0238)	(0.0237)	(0.0239)
Constant	0.481***	0.533***	0.486***	0.465***	0.484***
	(0.0880)	(0.0890)	(0.0939)	(0.0951)	(0.0936)
Observations	4,750	4,750	4,750	4,750	4,750
R-squared	0.230	0.232	0.231	0.231	0.231

Notes: ***, **, and * on coefficients denote significance at the 1%, 5%, and 10% levels respectively. Robust standard errors clustered by country-sector in parentheses. All specifications include country and 2-digit sector dummies.

Table 7: Process Innovation: Logit Estimates

	(1)	(2)	(3)	(4)	(5)
NTM Measure=	2004 Average	2005 Average	2008 Average	2008 Coverage	Ad Valorum
SPS	0.0309	0.00875	0.0188	-0.451	
	(0.0510)	(0.0422)	(0.0263)	(0.765)	
TBT	-0.00317	-0.00901	0.00351	0.165	
	(0.0131)	(0.0100)	(0.0108)	(0.598)	
Tariff	-0.00585*	-0.00464*	-0.00473**	-0.00453*	-0.00487*
	(0.00334)	(0.00242)	(0.00237)	(0.00244)	(0.00257)
Ad Valorum Equiv.					-0.378
					(0.311)
Productivity	0.0619	0.0631	0.0645	0.0650	0.0655
	(0.0428)	(0.0431)	(0.0430)	(0.0430)	(0.0428)
Age	0.0186	0.0174	0.0166	0.0165	0.0143
	(0.0580)	(0.0577)	(0.0579)	(0.0574)	(0.0572)
Size	0.271***	0.276***	0.274***	0.275***	0.277***
	(0.0527)	(0.0526)	(0.0530)	(0.0527)	(0.0526)
Exporter	0.279**	0.278**	0.275**	0.272**	0.268**
	(0.120)	(0.119)	(0.118)	(0.118)	(0.117)
Importer	0.214*	0.217*	0.220*	0.220*	0.216*
	(0.122)	(0.122)	(0.122)	(0.121)	(0.121)
Foreign	-0.355**	-0.358**	-0.360**	-0.354**	-0.351**
	(0.149)	(0.149)	(0.149)	(0.151)	(0.150)
Multi	0.171	0.171	0.172	0.173	0.176
	(0.111)	(0.111)	(0.112)	(0.111)	(0.110)
License	0.710***	0.705***	0.704***	0.703***	0.706***
	(0.191)	(0.192)	(0.192)	(0.193)	(0.191)
Quality	0.408***	0.406***	0.403***	0.401***	0.399***
	(0.147)	(0.149)	(0.149)	(0.148)	(0.148)
Constant	-1.295***	-1.249***	-1.419***	-1.326***	-1.201***
	(0.453)	(0.472)	(0.497)	(0.445)	(0.456)
Observations	4,745	4,745	4,745	4,745	4,745
Pseudo R-squared	0.172	0.172	0.172	0.172	0.172

Notes: ***, **, and * on coefficients denote significance at the 1%, 5%, and 10% levels respectively. Robust standard errors clustered by country-sector in parentheses. All specifications include country and 2-digit sector dummies.

Table 8: Process Innovation: Probit Estimates

	(1)	(2)	(3)	(4)	(5)
NTM Measure=	2004 Average	2005 Average	2008 Average	2008 Coverage	Ad Valorum
SPS	0.0195	0.00641	0.0116	-0.217	
	(0.0291)	(0.0245)	(0.0157)	(0.458)	
TBT	-0.00237	-0.00585	0.00192	0.0931	
	(0.00754)	(0.00576)	(0.00637)	(0.364)	
Tariff	-0.00362*	-0.00293**	-0.00298**	-0.00283*	-0.00306*
	(0.00200)	(0.00148)	(0.00145)	(0.00149)	(0.00157)
Ad Valorum Equiv.					-0.220
					(0.187)
Productivity	0.0378	0.0387	0.0395	0.0400	0.0403
	(0.0251)	(0.0253)	(0.0252)	(0.0252)	(0.0251)
Age	0.0117	0.0106	0.00999	0.0100	0.00839
	(0.0339)	(0.0338)	(0.0338)	(0.0337)	(0.0335)
Size	0.158***	0.161***	0.160***	0.161***	0.161***
	(0.0305)	(0.0304)	(0.0306)	(0.0304)	(0.0303)
Exporter	0.172**	0.171**	0.169**	0.167**	0.164**
	(0.0712)	(0.0708)	(0.0700)	(0.0704)	(0.0699)
Importer	0.126*	0.128*	0.130*	0.130*	0.127*
	(0.0723)	(0.0721)	(0.0722)	(0.0715)	(0.0715)
Foreign	-0.216**	-0.217**	-0.218**	-0.215**	-0.212**
	(0.0872)	(0.0869)	(0.0868)	(0.0879)	(0.0876)
Multi	0.102	0.103	0.104	0.105	0.107
	(0.0670)	(0.0672)	(0.0676)	(0.0672)	(0.0667)
License	0.402***	0.397***	0.397***	0.396***	0.398***
	(0.107)	(0.107)	(0.107)	(0.108)	(0.107)
Quality	0.233***	0.233***	0.231***	0.229***	0.228***
	(0.0833)	(0.0846)	(0.0845)	(0.0841)	(0.0841)
Constant	-0.764***	-0.736***	-0.838***	-0.791***	-0.714***
	(0.269)	(0.279)	(0.293)	(0.265)	(0.271)
Observations	4,745	4,745	4,745	4,745	4,745
Pseudo R-squared	0.172	0.172	0.172	0.172	0.172

Notes: ***, **, and * on coefficients denote significance at the 1%, 5%, and 10% levels respectively. Robust standard errors clustered by country-sector in parentheses. All specifications include country and 2-digit sector dummies.

Table 9: Process Innovation: Linear Probability Estimates

	(1)	(2)	(3)	(4)	(5)
NTM Measure=	2004 Average	2005 Average	2008 Average	2008 Coverage	Ad Valorum
SPS	0.00500	0.000823	0.00304	-0.0998	
	(0.00883)	(0.00754)	(0.00492)	(0.148)	
TBT	-0.000836	-0.00202	0.000569	0.0375	
	(0.00257)	(0.00198)	(0.00210)	(0.117)	
Tariff	-0.00121*	-0.000936*	-0.000947**	-0.000913*	-0.000985*
	(0.000662)	(0.000484)	(0.000478)	(0.000485)	(0.000510)
Ad Valorum Equiv.					-0.0759
					(0.0634)
Productivity	0.0127	0.0130	0.0132	0.0134	0.0135
	(0.00834)	(0.00838)	(0.00835)	(0.00835)	(0.00830)
Age	0.00286	0.00264	0.00254	0.00255	0.00206
	(0.0117)	(0.0117)	(0.0117)	(0.0117)	(0.0116)
Size	0.0494***	0.0504***	0.0499***	0.0502***	0.0503***
	(0.00962)	(0.00960)	(0.00969)	(0.00960)	(0.00957)
Exporter	0.0570**	0.0570**	0.0565**	0.0558**	0.0550**
	(0.0229)	(0.0228)	(0.0225)	(0.0227)	(0.0225)
Importer	0.0418*	0.0419*	0.0427*	0.0427*	0.0416*
	(0.0239)	(0.0238)	(0.0238)	(0.0237)	(0.0236)
Foreign	-0.0621**	-0.0621**	-0.0625**	-0.0613**	-0.0606**
	(0.0262)	(0.0260)	(0.0260)	(0.0263)	(0.0262)
Multi	0.0338	0.0340	0.0342	0.0343	0.0350*
	(0.0212)	(0.0212)	(0.0213)	(0.0212)	(0.0210)
License	0.114***	0.112***	0.112***	0.112***	0.113***
	(0.0305)	(0.0307)	(0.0307)	(0.0310)	(0.0307)
Quality	0.0636***	0.0631**	0.0626**	0.0620**	0.0621**
	(0.0239)	(0.0243)	(0.0243)	(0.0242)	(0.0242)
Constant	0.277***	0.285***	0.252***	0.266***	0.291***
	(0.0882)	(0.0918)	(0.0957)	(0.0879)	(0.0906)
Observations	4,745	4,745	4,745	4,745	4,745
R-squared	0.213	0.212	0.212	0.212	0.213

Notes: ***, **, and * on coefficients denote significance at the 1%, 5%, and 10% levels respectively. Robust standard errors clustered by country-sector in parentheses. All specifications include country and 2-digit sector dummies.

Table 10: Excluding Mexico

	(1) Product Innovation	(2) Process Innovation
SPS	0.0226	-0.0112
	(0.0328)	(0.0418)
TBT	-0.0369***	-0.00704
	(0.0108)	(0.0126)
Tariff	7.47e-05	0.00170
	(0.00282)	(0.00220)
Productivity	0.00382	0.0726
	(0.0480)	(0.0466)
Age	-0.00296	-0.0179
	(0.0598)	(0.0564)
Size	0.270***	0.309***
	(0.0642)	(0.0598)
Exporter	0.0952	0.186
	(0.127)	(0.117)
Importer	0.392***	0.149
	(0.119)	(0.127)
Foreign	-0.512***	-0.315**
	(0.197)	(0.160)
Multi	0.353***	0.108
	(0.105)	(0.103)
License	0.419***	0.361**
	(0.144)	(0.145)
Quality	0.205	0.331**
	(0.171)	(0.163)
Constant	-0.0425	-1.381***
	(0.491)	(0.490)
Observations	3,728	3,723
Pseudo R-squared	0.0795	0.0757

Notes: ***, **, and * on coefficients denote significance at the 1%, 5%, and 10% levels respectively. Estimated using logit and 2005 averages for SPS, TBT, and Tariff. Robust standard errors clustered by country-sector in parentheses. All specifications include country and 2-digit sector dummies.

Table 11: Product Innovation: Heterogenous Effects

X=	(1) Productivity	(2) Age	(3) Size	(4) Exporter	(5) Importer	(6) Foreign	(7) Multi	(8) License	(9) Quality
SPS	0.324	-0.0359	0.0266	0.0347	0.0320	0.0214	0.0915*	0.0355	0.0385
	(0.200)	(0.118)	(0.0627)	(0.0322)	(0.0294)	(0.0296)	(0.0539)	(0.0321)	(0.0319)
TBT	-0.125	-0.00122	-0.0486**	-0.0514***	-0.0324***	-0.0347***	-0.0313**	-0.0321**	-0.0350***
	(0.107)	(0.0266)	(0.0218)	(0.0118)	(0.0119)	(0.0116)	(0.0141)	(0.0132)	(0.0115)
Tariff	-0.0149	-0.0111	-0.0117	-0.00987***	-0.00943***	-0.00798***	-0.00824	-0.00847***	-0.00794***
	(0.0200)	(0.00796)	(0.00773)	(0.00306)	(0.00308)	(0.00244)	(0.00517)	(0.00259)	(0.00271)
SPS*X	-0.0287	0.0234	0.00103	0.00145	0.00210	0.122	-0.0970	-0.0466	-0.0308
	(0.0191)	(0.0338)	(0.0158)	(0.0517)	(0.0496)	(0.0999)	(0.0614)	(0.0694)	(0.0559)
TBT*X	0.00896	-0.0105	0.00433	0.0378***	-0.00267	0.00983	-0.000368	-0.00945	0.00801
	(0.0104)	(0.00902)	(0.00479)	(0.0115)	(0.0131)	(0.0166)	(0.0128)	(0.0430)	(0.0161)
Tariff*X	0.000717	0.00115	0.00118	0.00797	0.00581	0.000407	0.000294	0.00637	-0.000593
	(0.00200)	(0.00254)	(0.00247)	(0.00600)	(0.00643)	(0.00857)	(0.00602)	(0.00746)	(0.00719)
Productivity	-0.0223	-0.0118	-0.0112	-0.0122	-0.0115	-0.0122	-0.0121	-0.0116	-0.0107
	(0.0573)	(0.0425)	(0.0425)	(0.0422)	(0.0427)	(0.0427)	(0.0429)	(0.0424)	(0.0430)
Age	0.0255	0.00901	0.0265	0.0249	0.0265	0.0283	0.0241	0.0276	0.0276
	(0.0610)	(0.0955)	(0.0609)	(0.0605)	(0.0607)	(0.0608)	(0.0605)	(0.0610)	(0.0609)
Size	0.260***	0.256***	0.220***	0.255***	0.256***	0.256***	0.257***	0.256***	0.256***
	(0.0568)	(0.0568)	(0.0822)	(0.0565)	(0.0569)	(0.0566)	(0.0565)	(0.0568)	(0.0567)
Exporter	0.195	0.196	0.195	-0.0476	0.197	0.193	0.196	0.197	0.195
	(0.137)	(0.137)	(0.137)	(0.213)	(0.138)	(0.137)	(0.138)	(0.138)	(0.137)
Importer	0.456***	0.463***	0.467***	0.464***	0.347*	0.462***	0.470***	0.465***	0.464***
	(0.115)	(0.113)	(0.113)	(0.113)	(0.178)	(0.114)	(0.113)	(0.113)	(0.114)
Foreign	-0.483**	-0.474**	-0.480**	-0.489***	-0.478**	-0.578**	-0.474**	-0.476**	-0.476**
	(0.188)	(0.187)	(0.188)	(0.187)	(0.188)	(0.270)	(0.188)	(0.188)	(0.189)
Multi	0.383***	0.384***	0.382***	0.387***	0.381***	0.385***	0.439***	0.381***	0.383***
	(0.109)	(0.109)	(0.110)	(0.110)	(0.109)	(0.110)	(0.144)	(0.109)	(0.110)
License	0.758***	0.754***	0.755***	0.758***	0.754***	0.761***	0.740***	0.673***	0.753***
	(0.182)	(0.185)	(0.185)	(0.183)	(0.186)	(0.185)	(0.186)	(0.261)	(0.185)
Quality	0.261*	0.261*	0.259*	0.260*	0.264*	0.261*	0.262*	0.265*	0.276
	(0.151)	(0.150)	(0.150)	(0.151)	(0.149)	(0.151)	(0.150)	(0.151)	(0.200)
Constant	0.132	0.113	0.179	0.151	0.0913	0.0749	0.0229	0.0615	0.0455
	(0.628)	(0.487)	(0.459)	(0.440)	(0.446)	(0.447)	(0.457)	(0.452)	(0.456)
Observations	4,750	4,750	4,750	4,750	4,750	4,750	4,750	4,750	4,750
Pseudo R-squared	0.191	0.191	0.190	0.191	0.190	0.191	0.191	0.190	0.190

Notes: ***, **, and * on coefficients denote significance at the 1%, 5%, and 10% levels respectively. Estimated using logit and 2005 averages for SPS, TBT, and Tariff. Robust standard errors clustered by country-sector in parentheses. All specifications include country and 2-digit sector dummies.

Table 12: Process Innovation: Linear Probability Estimates

X=	(1) Productivity	(2) Age	(3) Size	(4) Exporter	(5) Importer	(6) Foreign	(7) Multi	(8) License	(9) Quality
SPS	0.252	0.109	0.0469	0.0308	0.0233	0.0233	0.0883**	0.0132	0.00654
	(0.174)	(0.114)	(0.0680)	(0.0350)	(0.0372)	(0.0422)	(0.0440)	(0.0464)	(0.0484)
TBT	-0.00558	0.0605***	0.0454**	-0.00455	0.000665	-0.00336	-0.00996	-0.00901	0.00106
	(0.0581)	(0.0231)	(0.0184)	(0.0123)	(0.0100)	(0.0111)	(0.0176)	(0.00956)	(0.0114)
Tariff	-0.00940	-0.00899	-0.00416	-0.00648*	-0.00439	-0.00562**	-0.00184	-0.00487**	-0.00435
	(0.0187)	(0.00750)	(0.00906)	(0.00332)	(0.00329)	(0.00268)	(0.00605)	(0.00244)	(0.00271)
SPS*X	-0.0237	-0.0336	-0.00869	-0.115**	-0.0745	-0.116	-0.127***	-0.0521	0.00185
	(0.0167)	(0.0353)	(0.0160)	(0.0553)	(0.0552)	(0.0953)	(0.0426)	(0.0845)	(0.0615)
TBT*X	-9.07e-05	-0.0219***	-0.0143***	-0.00481	-0.0275*	-0.0315	0.00492	-0.000771	-0.0367**
	(0.00526)	(0.00625)	(0.00420)	(0.0154)	(0.0150)	(0.0198)	(0.0207)	(0.0317)	(0.0165)
Tariff*X	0.000485	0.00159	-0.000182	0.00731	-0.00111	0.0105	-0.00465	0.00346	-0.00187
	(0.00193)	(0.00266)	(0.00273)	(0.00687)	(0.00652)	(0.00939)	(0.00734)	(0.0100)	(0.00724)
Productivity	0.0677	0.0637	0.0637	0.0670	0.0640	0.0640	0.0626	0.0633	0.0615
	(0.0552)	(0.0429)	(0.0431)	(0.0432)	(0.0434)	(0.0431)	(0.0435)	(0.0431)	(0.0432)
Age	0.0164	0.0539	0.0180	0.0158	0.0140	0.0141	0.0142	0.0177	0.0155
	(0.0579)	(0.0848)	(0.0575)	(0.0577)	(0.0578)	(0.0575)	(0.0572)	(0.0574)	(0.0581)
Size	0.279***	0.279***	0.319***	0.279***	0.278***	0.275***	0.278***	0.276***	0.277***
	(0.0526)	(0.0524)	(0.0764)	(0.0527)	(0.0525)	(0.0531)	(0.0525)	(0.0529)	(0.0527)
Exporter	0.281**	0.283**	0.279**	0.188	0.281**	0.284**	0.276**	0.278**	0.279**
	(0.120)	(0.119)	(0.120)	(0.197)	(0.120)	(0.120)	(0.120)	(0.120)	(0.120)
Importer	0.212*	0.206*	0.211*	0.219*	0.329	0.220*	0.226*	0.217*	0.223*
	(0.123)	(0.124)	(0.121)	(0.123)	(0.212)	(0.123)	(0.122)	(0.122)	(0.122)
Foreign	-0.360**	-0.366**	-0.344**	-0.343**	-0.345**	-0.416	-0.359**	-0.360**	-0.347**
	(0.148)	(0.148)	(0.148)	(0.146)	(0.149)	(0.254)	(0.149)	(0.149)	(0.149)
Multi	0.169	0.166	0.179	0.172	0.170	0.170	0.342**	0.169	0.172
	(0.111)	(0.110)	(0.112)	(0.111)	(0.110)	(0.111)	(0.164)	(0.111)	(0.111)
License	0.705***	0.715***	0.701***	0.702***	0.701***	0.697***	0.693***	0.668**	0.695***
	(0.191)	(0.190)	(0.194)	(0.191)	(0.193)	(0.191)	(0.193)	(0.279)	(0.193)
Quality	0.405***	0.399***	0.420***	0.407***	0.419***	0.413***	0.404***	0.406***	0.541**
	(0.149)	(0.149)	(0.148)	(0.149)	(0.149)	(0.150)	(0.149)	(0.150)	(0.215)
Constant	-1.340**	-1.386***	-1.443***	-1.286***	-1.302***	-1.263***	-1.361***	-1.251***	-1.262***
	(0.591)	(0.467)	(0.478)	(0.466)	(0.463)	(0.470)	(0.483)	(0.467)	(0.471)
Observations	4,745	4,745	4,745	4,745	4,745	4,745	4,745	4,745	4,745
Pseudo R-squared	0.172	0.173	0.173	0.173	0.173	0.173	0.173	0.172	0.173

Notes: ***, **, and * on coefficients denote significance at the 1%, 5%, and 10% levels respectively. Estimated using logit and 2005 averages for SPS, TBT, and Tariff. Robust standard errors clustered by country-sector in parentheses. All specifications include country and 2-digit sector dummies.

Table 13: Education Interactions

	(1) Product	(2) Process
SPS	0.0396	-0.147
	(0.199)	(0.227)
TBT	0.0743	0.337
	(0.374)	(0.289)
Tariff	-0.000617	-0.00147
	(0.0102)	(0.00864)
SPS*Educ.	-0.000934	0.0204
	(0.0239)	(0.0288)
TBT*Educ.	-0.0117	-0.0382
	(0.0408)	(0.0313)
Tariff*Educ.	-0.00113	-0.000450
	(0.00156)	(0.00135)
Productivity	-0.0114	0.0619
	(0.0426)	(0.0432)
Age	0.0280	0.0171
	(0.0607)	(0.0565)
Size	0.255***	0.273***
	(0.0570)	(0.0530)
Exporter	0.198	0.290**
	(0.137)	(0.118)
Importer	0.462***	0.215*
	(0.112)	(0.121)
Foreign	-0.469**	-0.344**
	(0.184)	(0.147)
Multi	0.384***	0.165
	(0.109)	(0.110)
License	0.749***	0.694***
	(0.186)	(0.191)
Quality	0.262*	0.402***
	(0.149)	(0.146)
Constant	0.123	-1.180**
	(0.453)	(0.473)
Observations	4,750	4,745
Pseudo R-squared	0.190	0.173

Notes: ***, **, and * on coefficients denote significance at the 1%, 5%, and 10% levels respectively. Estimated using logit and 2005 averages for SPS, TBT, and Tariff. Robust standard errors clustered by country-sector in parentheses. All specifications include country and 2-digit sector dummies.

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