Specific duties: friends or foes for developing exporters?

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Abstract

In this paper, we explore the impact of specific duties on the patterns of agricultural trade, i.e. trade values and trade prices (proxied by trade unit values). Specific duties are showed to encourage countries to export products with higher prices, leading to an "Alchian Allen effect" on unit values. Their restrictive effect is smaller for developed countries as compared to developing countries. It can be explained by the quality specialization of these countries, but also by the low level of quality differentiation of their exports. Our results highlight the discriminating nature of specific duties for low-income countries.

Introduction

Tariffs remain one of the trade policy instruments the most used, even if non-tariff barriers, more opaque and discretionary, are gradually replacing them. Generally, tariffs are *ad valorem* (percentage of the CIF price of the imported good) or specific (*ad pesum*, expressed as an amount of money per quantity unit). Other types of protectionist tools are used by importers, but they remain extremely rare and concern a minority of countries (Tariff Rate Quotas – here after TRQs –, entry prices…). The intrinsic difference between *ad valorem* and specific tariffs influences the structure of trade flows, through changes in relative prices, but also the prices of traded goods. Thus, the specific duties are a strong incentive for trading partners to export high quality goods as the translation of those duties into percentage lowers with the price of exports. Unsurprisingly, specific duties are often accused of discriminating exports from low-income countries, their producers being specialized in low quality segments and also in agricultural products, relatively more protected with specific tariffs than industrial goods.

The aim of this paper is to explore the impact of specific duties on the patterns of agricultural trade. We proceed in two steps. First, we estimate the impact of specific duties on trade prices, using unit values as a proxy. We showed that specific duties encourage countries to export products with higher prices. Hence, specific duties act as transport cost according to the Alchian-Allen conjecture. Secondly, we measure to what extend specific duties limit trade. If specific duties always act as a barrier to trade, we find that their restrictive effect is smaller for developed countries as compared to developing countries. By looking more deeply the impact of specific duties on trade, we see that the highest impact of specific duties on trade for developing countries can be explained by the quality specialization of these countries, but also by the low level of quality differentiation of their exports. These results highlight the discriminating nature of specific duties for low-income countries.

Our paper relies on three different strands of literature. The first one refers to papers looking at the consequences of trade policies instruments on trade patterns, including prices. For example, Bureau *et* ali (2007) focus on MERCOSUR's exports, subject to Tariff Rate Quotas, as well as specific or composite tariffs, when entering the European beef market. The authors design a partial equilibrium model to investigate the effects of a set of policy instruments on the composition of imports. Numerical simulations show that the structure of EU protection leads, in the beef market, to a significant positive impact on prices. The second stand of literature concerns papers analyzing the

determinants of trade prices. Among them, we can quote all the articles that test the Alchian-Allen conjecture by looking at the consequences of transportation costs on the unit values of exported goods (Hummels and Skiba (2004) Schott (2004, 2007) and Hummels et Klenow (2005), Martin (2012)). Finally, our article is part of the literature on specific duties, which is quite lean. Chowdhury (2008, 2009) studies the impact of specific duties on welfare of African countries, using a General Equilibrium model[1].

Still, to our knowledge, there is no existing literature that analyzes the impact of specific duties on trade patterns, and particularly trade prices. In this paper, we propose to estimate econometrically the impact of specific duties both on trade unit values and trade values.

This paper is organized as follows: section 1 presents the characteristics of specific duties. Section 2 quantifies the impact of specific duties on trade unit values (used as a proxy of trade prices). Section 3 goes further by empirically tests the impact of specific duties on the value of trade, distinguishing between developed and developing countries. Section 4 concludes

1. What is a specific duty?

Customs organizations have reviewed the advantages and the disadvantages of specific duties[2], as their consequences on trade differ from those of the more commonly used ad-valorem tariff. Economically, the use of specific duties allows importers to protect their market against low quality products (the value of specific component being a decreasing function in price, its translation into percentage decrease with the value of the imported goods). Moreover, as they do not vary with price imports, they also permit to stabilize tariff revenues. Besides, they isolate importer from a part of international volatility[3], which is a key issue for agricultural products.

From a more practical point of view, those duties may reduce the time dedicated to administrative procedures at the border (the determination of the weight can be easier than the estimation of a price). Drawbacks are also well-known: as a trade barrier, they reduce the volume of traded goods. On the customs' side, determining the weight of imported goods can, on the contrary, rise the time spent at the border and augment difficulties of conservation for agricultural products.

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[1] The author examines the consequences on Sub-Saharan African (SSA) countries' welfare coming from preferences granted by the European Union, finding that those instruments wash away more than half of the welfare benefits enjoyed by SSA countries.

[2] See « Changement du système de calcul des droits de douane à la lumière des avantages et des inconvénients respectifs des systèmes fondés sur le poids et sur la valeur » (Report on CER-CN 04.3435 of 8 october 2004) http://www.efd.admin.ch/dokumentation/zahlen/00578/01096/index.html?download=NHzLpZeg7t,lnp6I0NTU042l2Z6ln1ae2IZn4Z2qZpnO2Yuq2Z6gpJCDdXt6fGym162epYbg2c_JjKbNoKSn6A--&lang=fr

[3] See Bale79

In 2007[4], 70 countries[5] use specific duties, at least for one product. Countries' profiles are very heterogeneous and disentangling similarities between them remains difficult. However, one can see that rich countries (EU27, USA, EFTA, Canada…) all use these types of instruments. EFTA is a particular case with countries that almost exclusively protect their market with such instruments.[6] Insular countries constitute another bulk of the users of specific duties. In 2007, 26 islands used a tariff schedule defined on a per unit basis. They can be developed economies like Japan, Australia or New Zealand, but also small developing economies, like Vanuatu, Seychelles or Mauritius. Eventually, 18 of those 70 countries protect less than 2% of their products with specific duties (Australia and New Zealand, but also China, India or Turkey).

Table 1: Applied protection (%), by level of development and type of instruments (*ad valorem* and *ad valorem* equivalent (AVE) of specific duties), 2007

Importer	Exporter	Type	AVE (%)	Share of HS lines	Share of Trade (%)	Trade (billions of USD)
Developed Countries	Developed Countries	Ad valorem	20,8	35	24	39
		Specific	**12,9**	**12**	**19**	**31**
		TRQs	42,1	6	13	21
		Nul	0,0	47	45	74
	Developing Countries	Ad valorem	17,2	24	20	34
		Specific	**16,8**	**10**	**13**	**22**
		TRQs	46,8	6	11	19
		Nul	0,0	60	56	96
Developing Countries	Developed Countries	Ad valorem	24,1	82	66	82
		Specific	**27,4**	**2**	**5**	**7**
		TRQs	37,2	0	3	4
		Nul	0,0	15	25	31
	Developing Countries	Ad valorem	25,5	80	63	83
		Specific	**45,9**	**2**	**5**	**6**
		TRQs	31,6	0	0	1
		Nul	0,0	18	32	43

Source: MAcMap-HS6 2007, Authors' calculations.

Given their capacities to export more expensive goods, developed countries are less constrained by specific tariffs than developing countries, regardless of the destination market. Thus, the *ad valorem* equivalent they face is about 13% on their own markets while developing countries encounter a

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[4] It is MAcMap-HS6's most recent available year (tariffs dataset). 190 importing countries are present in the dataset.

[5] European Union being considered as a single entity. Considering industry, there 74 countries that use specific tariffs.

[6] The ratio (Number of lines protected by specific tariffs/Number of lines with positive duties) is 100% for Liechtenstein: 100%, 100% for Switzerland, 97% for Norway and 40% for Iceland.

protection of almost 17% on the same destination. For *ad valorem* duties, the hierarchy is reverse: due to preferences (the share of positive *ad valorem* HS6 lines faced by developing countries is less important: 24% versus 35%), the average *ad valorem* faced by developed countries (20.8%) is higher than the one encountered by the developing exporters (17.2%). Moreover, if the protection faced by rich countries on their own markets is clearly different between *ad valorem* and *ad valorem* equivalents of specific (7.9 percentage points), the difference between the two instruments only slightly varies for developing countries (less than 0.5 percentage points).

On developing markets, rich countries face an *ad valorem* equivalent of specific lower than developing countries (27.4% against 45.9%), as for *ad valorem* duties. The conversion in percentage therefore shows a significant advantage for rich countries compared to developing exporters. The difference in the *ad valorem* protection is relatively low: developing countries apply 24.1% to developed countries and 25.5% to their developing partners.

Regarding trade patterns, developed countries import more agricultural products, in value, than the rest of the world. They tend to import more from developing countries than rich countries. Specific tariffs clearly appear as important barrier to trade: acknowledging the fact that they may not concern the same products, they considerably reduce trade between countries, compared to a pure *ad valorem* duty. This is particularly the case for importers belonging to developing countries (13 billion USD are imported by developing countries under specific duties whereas 165 billion USD are imported under positive ad valorem tariffs).

Agriculture is our point of interest. Indeed, even if agricultural trade volumes are smaller than the ones of industry, specific duties remain of the first importance for this sector: In 2007, the share of specific HS lines is about 4% (less than 1% for industry) and the share of trade under those instruments is 13% (compared to 4% in industry). Finally, the average *ad valorem* equivalent on HS6 lines subject to specific duties is 17.5%, which is clearly greater than the AVE in the industry (8%), justifying our choice to focus on agriculture. Trade policies (and by extend, protectionist instruments) operating in the context of WTO, we use the WTO definition of agricultural products, as defined in Annex 1 of the Agreement on Agriculture[7].

Table 2 characterizes the sectoral use of specific tariffs in agricultural sector, in 2007, ranking them by decreasing order of the presence of such duties. It gives the share of specific HS lines over the number of lines of the sector (excluding null tariffs and TRQs), the ad valorem equivalent on those lines and the share of tariff peaks (ave - equal to or - greater than 100%) on those lines.

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[7] Thus, the HS definition of agricultural products does not exactly correspond to chapters 1-24.

Table 2: Sectoral use of specific duties, 2007.

HS2 Code	HS2 long Name	Share of HS6 lines (%)	AVE (%)	Share of Tariff Peaks (%)
22	Beverages. Spirits and Vinegar	22,7	21,3	30,6
17	Sugars and Sugar Confectionery	14,8	38,7	15,6
11	Products of the Milling Industry. Malt. Starches (…)	13,3	28,8	4,6
24	Tobacco and Manufactured Tobacco Substitutes	12,8	30,7	40,4
04	Dairy Produce. Birds Eggs. Natural Honey (…)	9,4	35,3	6,9
29	Organic Chemicals	9,3	27,8	
01	Live Animals	8,9	27,9	3,6
19	Preparations of Cereals. Flour Starch or Milk (…)	8,1	12,1	0,7
10	Cereals	7,5	16,2	2,4
20	Preparations of Vegetables, Fruit, Nuts (…)	7,0	12,2	3,4
16	Preparations of Meat, of Fish or of Crustaceans (…)	6,1	15,5	
15	Animal or Vegetable Fats and Oils (…)	5,8	15,2	3,7
02	Meat and Edible Meat Offal	5,5	13,5	2,8
21	Miscellaneous Edible Preparations	5,5	8,3	0,5
35	Albuminoidal Substances. Modified Starches. Glues (…)	5,1	10,2	1,3
23	Residues and Waste From the Food Industries.	4,3	8,0	7,9
07	Edible Vegetables and Certain Roots and Tubers.	4,3	11,7	2,8
18	Cocoa and Cocoa Preparations	3,9	17,3	
08	Edible Fruit and Nuts. Peel of Citrus Fruit or Melons.	3,7	10,6	0,3
12	Oil Seeds and Oleaginous Fruits. Miscellaneous.	3,4	8,0	10,7
38	Miscellaneous Chemical Products	3,3	9,1	
52	Cotton	1,7	10,2	
51	Wool Fine or Coarse Animal Hair. Horsehair (…)	1,3	1,1	
09	Coffee, Tea, Maté and Spices	1,2	5,6	
14	Vegetable Plaiting Materials. Vegetable Products N.E.S.	1,2	2,0	
06	Live Trees and other Plants. Bulbs Roots.	1,0	2,2	6,1
33	Essential Oils and Resinoids. Perfumery Cosmetics.	0,6	2,5	
05	Products of Animal Origin N.E.S.	0,5	16,4	
13	Lac. Gums Resins and othr Vegetable Saps and Extracts.	0,3	3,2	
53	Other Vegetable Textile Fibres.	0,1	0,1	
50	Silk	0,0	291,9	100,0

Source: MAcMap-HS6 2007, Authors' calculations.

The sectoral coverage of *ad pesum* duties also exhibits specificities. At the HS2 level, specific tariffs remain rare. Indeed, worldwide, none of any HS2 sectors contains more than a quarter of its HS6 lines covered by those instruments.

Four sectors HS2 contain more than 10% of their lines covered by specific tariffs. The most protected sector on those lines (in terms of shares) is the beverage, which contains, in addition, over 30% of tariff peaks. Sugar, the milling industry or tobacco and its manufactured substitutes (which is the sector containing the largest share of tariff peaks) are in the quartet head.

Some sectors appear relatively unaffected by the presence of specific duties, such as meat (5% of its HS lines covered by specific, with an average ave about 13.5%), for example. However, they contain other instruments that we exclude here the analysis, like TRQs.

The silk sector exhibits the highest average rate (almost 300% on average in this sector, but it only concerns a fraction of its HS lines). The sugar sector is further distinguished with an ave closed to 40%, followed by dairy produce (35%), tobacco (nearly 31%) and milling industry (29%).

2. The specific duties and the Alchian Allen Effect

2.1. The Alchian Allen Conjecture

The well-known Alchian-Allen conjecture (1964), also known as the "shipping the good apple out" effect, corresponds to the fact that exporters charge higher prices for remote destination. The transportation costs lead firms to export their higher priced/higher quality goods to distant partners, keeping their lower quality goods for closest or even domestic markets.

This prediction has been tested in a number of studies, some of them theoretically grounding the positive impact of distance on prices. Among those, Hummels and Skiba (2004) extend the initial model and prove that the relative strength of per unit and ad valorem costs matters. Baldwin and Harrigan (2011) propose a Melitz type model in which the heterogeneity of firms is not more productivity, but quality.

A variety of empirical articles looks at the consequences of transportation costs on the unit values of exported goods, through a quality upgrading effect. Schott (2004, 2007) and Hummels and Klenow (2005) examine the relationship between unit values and distance, at the country level. Martin (2012), Bastos and Silva (2010), Manova and Zhang (2009), using data on french exporting firm, find that firms charge higher F.O.B. unit values on exports to more remote countries.

The different analyses of the Alchian-Allen effect in the literature are always linked with the transportation costs, generally proxied by bilateral distance. Hummels and Skiba (2004) or Martin (2012) explore an alternative specification of transport costs by splitting them into an ad-valorem part (iceberg cost) and an additive part (per unit cost). The latter explains the Alchian-Allen effect. Indeed, its translation into percentage lowers with the value of the good, which makes an incentive for the firms to export more expensive goods.

However, as saw the previous section, the Alchian-Allen effect may also occurs in presence of other per-unit trade costs that are the specific duties. To our knowledge, nobody in the literature has

tested this effect for such duties. This is why we investigate whether the implementation of specific duties has a positive impact on trade prices. We test this hypothesis using data aggregated at the country level and use unit values as a proxy for trade prices. In the rest of the paper, we follow Schott (2008) and Fontagné et al (2008) by considering unit values as a proxy for the quality of products. We refer to Khandelwal (2010) for a discussion on the extraction of information on quality from prices or unit values.

2.2. Empirical test of the Alchian Allen effect of the specific duties

Empirical specification

To test the Alchian-Allen effect of specific duties by importing countries, we follow Hummels and Skiba (2004) or Martin (2009). We thus estimate an equation linking bilateral prices to the exporter's and importer's income, importers' tariffs and transport costs. Unlike Hummels and Skiba (2004), we do not have data on freight cost. The latter are approximated by the bilateral distance as in the empirical literature. One of the main differences from the quoted papers is that we consider the specific part of the tariffs, defined at the bilateral and product level[8].

$$\ln p_{ijkt} = \alpha \ln GDP/cap_{it} + \beta \ln GDP/cap_{it} + \gamma \ln dist_{ij} + \delta \ln Tspe_{ijkt} + \epsilon_{ijkt} \qquad (1)$$

Bilateral prices p_{ijkt} of imports of product k by country j from country i at time t are proxied by CIF import unit values, defined at the HS6 level, coming from the worldwide Trade Unit Value Database[9] of the CEPII. We use the GDP by capita of exporting and importing countries from the World Development Indicator of the World Bank, and the distance from the CEPII. Specific duties come from the MAcMap-HS6 dataset[10].

We restrict the sample of products to the agricultural sector[11], as we saw in the first section of the paper that this kind of protection mainly applies in this area. Equation (1) is estimated on years 2001, 2004, 2007, for which tariff data are available. Since unit values data are little noisy, we exclude extreme unit values, i.e. above 50 times the world median unit value for the product k and below 1/50 times the same median.

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[8] We also test an alternative specification, considering both *ad valorem* and specific part of the tariffs. Adding the *ad valorem* component of the tariff doesn't change the coefficient of the other variables. However, it raises problem when we instrument the specific duties because of multicolinearity of the two components of the tariffs.
[9] See Berthou and Emlinger (2012) for a description of the dataset
[10] See Guimbard, Jean, Mimouni and Pichot (2012) for a description of the dataset.
[11] According to the definition of agricultural products of the WTO

Bilateral unit values uv_{ijkt} and specific duties spe_{ijkt} are determined by a number of common observed and non-observed factors. To handle these simultaneity and endogeneity biases, we use two instruments for the specific duty. We first consider a variable equal to the mean export unit value of the importer j, by product k, that we cross with a dummy equal to 1 if the country j exports the product k, 0 otherwise. This export unit value is supposed to be a proxy of the price of the domestic products within the country. We assume that a country which products are expensive tends to implement higher specific duties than other countries, to protect its production from the competition of low price products. We use as second instrument a variable indicating whether the importing country is a net exporter of product k or not. Net exporters would tend more to use the specific duties instrument than net importers, which have less interest to protect their market from low quality products.

We estimate the equation (1) using exporter, importer, product and time fixed effects. As robustness checks, we use two alternatives specifications following Hummels and Skiba (2004). We first calculate variables means relative to product k and express all variables relative to this mean.

$$\ln uv_{ijkt} - \overline{\ln uv_k} = \alpha(\ln GDP_{it} - \overline{lnGDP_k}) + \beta (\ln GDP_{it} - \overline{lnGDP_k}) + \gamma (\ln dist_{ij} - \overline{\ln dist_k}) + \delta \left(\ln Tspe_{ijkt} - \overline{\ln Tspe_k}\right) + (\epsilon_{ijkt} - \overline{\epsilon_k}$$

$$) \qquad (2)$$

This specification allows to remove commodity-specific variations in price that can be unrelated to Alchian-Allen Effect (Hummels and Skiba (2004)). In a second alternative specification, we difference all the variables with respect to their mean by importer j and product k.

$$\ln uv_{ijkt} - \ln\left(uv_{jk}\right) = \alpha(\ln GDP_{it} - \overline{lnGDP_{jk}}) + \beta (\ln GDP_{it} - \overline{lnGDP_{jk}}) + \gamma (\ln dist_{ij} - \overline{\ln dist_{jk}}) + \delta \left(\ln Tspe_{ijkt} - \overline{\ln Tspe_{jk}}\right) + (\epsilon_{ijkt} - \overline{\epsilon_{jk}}$$

$$) \qquad (3)$$

Results

Table 1 reports the estimations of equation (1) using ordinary least square and instrumental variable estimator. The first two columns correspond to estimations on the full sample of observations. The two last columns report estimations on the sub-sample of observations that are not in free trade.

Table 1. Estimation on bilateral prices

	(1)	(2)	(3)	(4)
Distance	0.15***	0.13***	0.14***	0.15***
	(0.00)	(0.00)	(0.00)	(0.00)
GDP/cap importer	0.20***	0.21***	0.18***	0.21***
	(0.01)	(0.01)	(0.01)	(0.01)
GDP/cap exporter	0.14***	0.11***	0.14***	0.12***
	(0.01)	(0.01)	(0.01)	(0.01)
Specific duties	0.01***	0.23***	0.01***	0.24***
	(0.00)	(0.02)	(0.00)	(0.02)
number obs.	773 462	773 462	448 128	448 128
R2	0.603	0.555	0.585	0.514
IV	no	yes	no	yes
sargan p-value		0.421		0.445
Cragg Donald statistic		525.85		579.38

Standard errors in parentheses, * p<0.10, ** p<0.05, *** p<0.01

All the variables are in log. Exporter, importer, product and times fixed effects included

We find a significant and positive impact of specific duties on import unit values in all estimations, confirming the Alchian-Allen effect. Exporters tend to export at a higher price when they face specific duties, *ceteris paribus*. The coefficient is higher when accounting for endogeneity with an instrumental variable estimator. The Sargan and Cragg Donald statistic confirms that our instrumental variables are adequate. Alternative specification, using mean differentiated variables, give identical results (see in annex).

The other coefficients have the expected signs. We find the classic Alchian-Allen effect linked to transport cost with the positive coefficient of the distance. Exporters tend to export their most expensive product to distant importers. Both GDPs per capita have significant and positive impact. As shown in Schott (2001), prices increase with the exporter's income. They also positively vary with the importer's income.

In a second specification, we distinguish the impact of specific duties on unit values by level of income of the exporter. The results are reported in Table 2. In the first column, we use a dummy

"developing countries" equal to one if the exporting country is part of developing countries[12], zero otherwise. The negative coefficient on the cross variable indicates that the positive impact of specific duties on trade unit values is smaller for developing countries than for high income countries. This result is supported when we estimate the effect of specific duties on unit value, by deciles of GDP per capita of exporters: the higher the GDP per capita of the exporter, the higher is the coefficient. The Alchian-Allen effect of the specific duties depends on to the level of income of the exporting countries. Rich countries may have more possibilities to upgrade their quality when facing specific duties than poorest countries which range of quality by product is limited. The impact of specific duties implementation on developing countries exports will be further discussed in the next section of the paper.

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[12] The developing countries' group combines all the countries that are not high income countries according to the World Bank. EU27 is considered as developed.

Table 2. Estimation on bilateral prices according to exporter's level of development

	(1)	(2)
Distance	0.14***	0.15***
	(0.00)	(0.00)
GDP/cap importer	0.20***	0.20***
	(0.01)	(-0.01)
GDP/cap exporter	0.12***	0.11***
	(0.01)	(-0.01)
Specific duties	0.26***	0.07**
	(0.02)	-0.03
Specific duties*D(developing exporter)	-0.15***	
	(0.02)	
Specific duties*first decile of exporter GDP/cap		0.07**
		(0.03)
Specific duties*second decile of exporter GDP/cap		0.06***
		(0.02)
Specific duties*third decile of exporter GDP/cap		0.05***
		(0.02)
Specific duties*fourth decile of exporter GDP/cap		0.10***
		(0.02)
Specific duties*fifth decile of exporter GDP/cap		0.15***
		(0.02)
Specific duties*sixth decile of exporter GDP/cap		0.18***
		(0.02)
Specific duties*seventh decile of exporter GDP/cap		0.22***
		(0.02)
Specific duties*eigthth decile of exporter GDP/cap		0.24***
		(0.02)
Specific duties*ninth decile of exporter GDP/cap		0.29***
		(0.03)
Specific duties*tenth decile of exporter GDP/cap		0.35***
		(0.03)
number obs.	773 462	773462
R2	0.562	0.567
IV	yes	yes

Standard errors in parentheses, * p<0.10, ** p<0.05, *** p<0.01

3. The effect of specific duties on value of trade

In the previous section, we examined the impact of specific duties on unit values, highlighting the well-known Alchian-Allen effect of this kind of protection on trade prices. We now investigate the impact of specific duties on trade values. As a specific duty is a per unit trade cost, its impact on trade is supposed to be negative. However, the upgrading quality effect of specific duties may reduce the negative impact of specific duties on trade values, but only for countries that can increase their quality/prices according to the destination of their exports.

Empirical specification

We estimate a classical gravity equation that explains bilateral trade, at the product level, by importer and exporter's incomes, tariffs and bilateral variables as proxies of transport costs (distance, *colony*[13], *Border*[14] and *language*[15]). Countries and product fixed effects are added to take into account the multilateral resistance terms (Anderson and van Wincoop 2004).

$$\ln v_{ijkt} = \alpha \ln GDP_{it} + \beta \ln GDP_{it} + \gamma \ln dist_{ij} + \delta \ln Tspe_{ijkt} + \mu \ln Tadv_{ijkt} + colony_{ij} + Border_{ij} + language_{ij} + \lambda_i + \lambda_j + \lambda_k + \lambda_t + \epsilon_{ijkt}$$

$$(4)$$

Trade data come from the BACI database[16] and are defined at the HS6 digits commodity level. Tariffs[17], GDP and distance data come from the same bases that used in the previous section. Bilateral dummies (*colony, contig* and *language*) come from the CEPII's geodist[18] dataset.

Results

Table 3 reports the regression results of equation (4), using OLS. The negative impact of the specific duties on the value of trade is clearly confirmed. Despite their positive impact on trade unit values, specific duties still act as a trade barriers.

Other variables of the equation (4) have significant coefficients, with the expected sign. Distance and ad-valorem duties negatively impact on trade values, and sharing a border or a language, having a colonial links, marginally offset this effect. Trade increases with exporter and importer's GDP.

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[13] dummy equal to one is the two trading partners have a colonial history in common and zero otherwise
[14] dummy equal to one if the two countries share a border, zero otherwise
[15] dummy equal to one if the two countries have a common official language, zero otherwise
[16] See Gaulier and Zignago (2011)
[17] We use the power of the ad valorem part of the tariff, i.e. log(1+advalorem) in equation (4)
[18] See Mayer and Zignago (2011)

Table 3. Estimations on trade values

	(1)
Importer GDP	0.27***
	(0.01)
Exporter GDP	0.17***
	(0.01)
Distance	-0.38***
	(0.00)
Common Border	0.52***
	(0.01)
Common Official Language	0.12***
	(0.01)
Colonial History	0.04***
	(0.01)
Ad valorem duties	-1.13***
	(0.02)
Specific duties	-0.07***
	(0.00)
number obs.	1 546 527
r2	0.236

Standard errors in parentheses, * p<0.10, ** p<0.05, *** p<0.01
All the variables are in log, exporter, importer, product and times fixed effects included

In the previous section, we saw that the Alchian-Allen effect of the specific duties is smaller for developing countries and decreases with exporters' GDP per capita. We are now investigating whether the impact of this kind of duties on trade value is different according to the level of development of the country. To do so, we follow the same strategy as in the previous section and use cross variables with specific duties (see Table 4). Specific duties appear to have higher impact on trade values for developing countries than for the others (cross variables are negative and significant). Moreover, this impact decreases with the GDP per capita of the exporting country. For lowest income countries, the coefficients of the cross variable is not significant or negative, while they are positive for countries which GDP per capita is under the world median income, that means that the negative effect of specific duties on trade is lower for high income countries. This result is in line with those concerning unit values. Developed countries' exports are less constrained than the developing countries'.

Table 4. Estimations on trade values by level of exporter's income

	(1)	(2)
Importer GDP	0.27***	0.27***
	(0.01)	(0.01)
Exporter GDP	0.17***	0.16***
	(0.01)	(0.01)
Distance	-0.38***	-0.38***
	(0.00)	(0.00)
Common Border	0.52***	0.52***
	(0.01)	(0.01)
Common Official Language	0.11***	0.12***
	(0.01)	(0.01)
Colonial History	0.04***	0.04***
	(0.01)	(0.01)
Ad valorem duties	-1.12***	-1.12***
	(0.02)	(0.02)
Specific duties	-0.05***	-0.12***
	(0.00)	(0.01)
Specific duties*developing exporter	-0.04***	
	(0.00)	
Specific duties*first decile of exporter GDP/cap		0.01
		(0.02)
Specific duties*second decile of exporter GDP/cap		0.00
		(0.00)
Specific duties*third decile of exporter GDP/cap		-0.02*
		(0.01)
Specific duties*fourth decile of exporter GDP/cap		-0.01
		(0.01)
Specific duties*fifth decile of exporter GDP/cap		0.06***
		(0.01)
Specific duties*sixth decile of exporter GDP/cap		0.05***
		(0.01)
Specific duties*seventh decile of exporter GDP/cap		0.06***
		(0.01)
Specific duties*eigthth decile of exporter GDP/cap		0.06***
		(0.01)
Specific duties*ninth decile of exporter GDP/cap		0.08***
		(0.01)
Specific duties*tenth decile of exporter GDP/cap		0.07***
		(0.01)
number obs.	1 546 527	1 546 527
r2	0.236	0.236

Standard errors in parentheses, * p<0.10, ** p<0.05, *** p<0.01

All the variables are in log, exporter, importer, product and times fixed effects included

Quality specialization of developing countries and the impact of specific duties

The strengthened effect of specific duties on developing countries' exports may be explained by two factors: firstly, for each product these countries may have a relatively narrow range of prices, and consequently less possibility to do pricing-to-market. Secondly, developing countries usually export products at low prices; they are consequently more sensitive to specific duties than developed countries' exports.

Table 5 provides some descriptive statistics on the quality specialization of developing countries. For each country and product, we compute the relative price index RP_{ikt} that is equals to the mean export unit value uv_{ikt} by exporter i, product k and year t, relative to the world mean export unit value uv_{kt} by product k and year t. Greater than unity, it means that the country i exports the product k at higher price that the world price average, i.e. that it exports higher quality products.[19] At the opposite, an index inferior to unity corresponds to a specialization on low quality segment for the product k for country i. Table 5 reports the mean and median relative price index UV for all products and all exporters, for each group of exporting countries, classified by decile of GDP per capita. Those indicators confirm that developing countries tend to export, on average, at a lower price than the world. They also show that the top exporters, ranked by level of income, have a high quality specialization for each product they exports. In the second column of the table, we present the average coefficient of variation of export unit values computed by exporter i, product k and year t. It appears that, in average, high income countries have higher coefficient of variation of export price than developing countries. These latest have consequently a weaker quality range for each product, as compared to other countries.

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[19] For a discussion on this index and its relation with the quality of product, see Berthou and Emlinger 2010.

Table 5. Export trade prices according to GDP per capita

Decile of GDP per capita of exporting countries	$RP_{ikt} = \frac{uv_{ikt}}{uv_{kt}}$ relative price index		Price variation coefficient by product and year	
	Mean	Median	Mean	Median
1	0.76	0.58	54.17	47.75
2	0.79	0.62	64.95	57.65
3	0.84	0.67	62.89	54.94
4	0.82	0.69	68.97	59.63
5	0.95	0.79	68.65	59.78
6	1.04	0.92	83.11	71.43
7	1.11	0.93	83.83	73.62
8	1.27	1.10	95.33	84.23
9	1.13	1.02	100.81	89.25
10	1.23	1.07	96.53	84.74

Authors'calculation from the Trade Unit Value database, 2001, 2004, 2007

In order to see whether the quality specialization can explain the larger impact of specific duties on the exports of developing countries, we estimate the effect of specific values using the two indicators defined above (table 6). In the first column, we estimate the effect of specific duties according to the relative price index RP_{ikt} of the exporting country. The positive coefficient shows that having a higher relative price index reduces the effect of specific duties on trade. Furthermore, as expected, a higher relative price index induces a higher level of trade for exporting countries. Thus, the quality specialization of the exporter affects the sensitivity of exports to specific duties. Being specialized in a higher segment of quality minimizes the effect of specific duties on trade.

In the second column of table 6, we estimate the effect of specific duties on trade with respect to the coefficient of variation of the exporting price, computed by product. It appears that having a larger range of price reduce the effect of specific duties on trade. Quality differentiation within the same product category allows exporting countries to avoid the restrictive impact of specific duties on trade. At the opposite, countries that do not have a large range of quality suffer more from the implementation of specific duties by destination countries. They have difficulties to do pricing-to-market by exporting quality products to countries with specific duties and/or high transport costs and lower quality product to more accessible markets. In other words, they cannot select "good" or "bad" apple according to their export destination, as they usually produce only one kind of apple.

Table 6. Estimations on trade values according to quality specialization indicators.

	(1)	(2)
Importer GDP	0.26***	0.27***
	(0.01)	(0.01)
Exporter GDP	0.15***	0.17***
	(0.01)	(0.01)
Distance	-0.38***	-0.38***
	(0.00)	(0.00)
Common Border	0.52***	0.52***
	(0.01)	(0.01)
Common Official Language	0.11***	0.11***
	(0.01)	(0.01)
Colonial History	0.04***	0.04***
	(0.01)	(0.01)
Ad valorem duties	-1.13***	-1.12***
	(0.02)	(0.02)
Specific duties	-0.09***	-0.10***
	(0.00)	(0.00)
Specific duties*RP_{ikt}	0.01***	
	(0.00)	
RP_{ikt}	0.12***	
	(0.02)	
Specific duties*Variation coefficient of price		0.05***
		(0.00)
Variation coefficient of price		0.13***
		(0.05)
number obs.	1 546 524	1 546 527
r2	0.236	0.236

Standard errors in parentheses, * $p<0.10$, ** $p<0.05$, *** $p<0.01$

All the variables are in log, exporter, importer, product and times fixed effects included

4. Conclusion

In this paper, we examined the impact of specific duties on unit values, highlighting the well-known Alchian-Allen effect. However, the possibility to increase exportations of more expansive products also depends on the level of development of the countries, their exporters being considered less capable of producing high quality goods.

The consequences of specific tariffs on trade confirm this fact: Quality differentiation within the same product category allows exporting countries to avoid the restrictive impact of specific duties on trade. On the contrary, countries that do not have a large range of quality suffer more from the implementation of specific duties by destination countries.

If specific duties protect from low quality products, they clearly penalized exporters from developing countries. Thus, the conversion of specific duties into *ad valorem*, as discussed under the Doha proposal, would possibly enhance trade of developing countries, but its magnitude will depend on the modalities of conversion into percentage (regarding the choices of official unit values, for example). The sinking of multilateral proposals and, thus, the *statu quo* on the use of specific duties can also obligate such countries to increase their products qualities. Unfortunately, the path to development is dotted with obstacles. If the presence of specific duties may be positive for exporters, forcing them to improve the quality of their products, it can also, by reducing their current trade (and thus their income and investment), locking them in a specialization in low quality which is far away from welfare creation and development.

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6. Annexes

Annex 1. Robustness checks estimation on bilateral prices.

1.1. Estimation on bilateral prices, using commodity differenced variables

	(1)	(2)
Distance	0.11***	0.11***
	(0.00)	(0.00)
GDP/cap importer	0.15***	0.14***
	(0.00)	(0.01)
GDP/cap exporter	0.16***	0.16***
	(0.00)	(0.00)
Specific duties	0.02***	0.09***
	(0.00)	(0.02)
number obs.	773 462	773 462
R2	0.137	0.127
IV	no	yes

All the variables are commodity differenced

Standard errors in parentheses, * $p<0.10$, ** $p<0.05$, *** $p<0.01$

1.2. Estimation on bilateral prices, using exporter commodity differenced variables

	(1)	(2)
Distance	0.13***	0.13***
	(0.00)	(0.00)
GDP/cap importer	0.14***	0.14***
	(0.00)	(0.01)
GDP/cap exporter	0.25***	0.25***
	(0.01)	(0.01)
Specific duties	0.02***	0.03*
	(0.00)	(0.02)
number obs.	773 462	773 462
R2	0.091	0.091
IV	no	yes

All the variables are exporter commodity differenced

Standard errors in parentheses, * p<0.10, ** p<0.05, *** p<0.01