

Multinational Retailers and Home Country Exports *

Angela Chepea^{†‡} Charlotte Emlinger[§] Karine Latouche[¶]

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(Preliminary. Comments welcomed)

Abstract

This paper questions whether the overseas expansion of a country's retailers fosters overall bilateral exports towards these host markets. To address this question, we consider an empirical trade model, where the foreign sales of multinational retailers reduce the fixed and variable trade costs of their co-national firms towards the same destination markets. We test our model with data on bilateral exports on a large panel of countries and the foreign sales of world's largest one hundred retailers over the 2001-2010 decade. For compatibility of data on exports and retailer's sales, we focus only on trade in agri-food products that are sold in most of retail outlets. We use an instrumental variables approach in order to control for a simultaneity and an endogeneity bias, both bilateral exports and retailers' sales being determined by a number of common observed and non-observed factors. Bilateral retail investments arise only for a small share of country pairs in our data. In order to address this feature of the data, we use alternative generated instruments that take into account the partially discrete distribution of retailers' sales abroad. We find a strong positive effect of the overseas presence of a country's retailers on its exports to those markets. This outcome is far from being trivial, as most products sold in retailers foreign outlets are locally-produced. It testifies that the overseas presence of a country's retail companies contributes to the reduction of trade costs towards these very markets for other origin country firms. Our result is robust to different specifications, the use of different sets of instrumental variables and econometric approaches.

Keywords: International Trade, Multinational Retailers, Heterogeneous Firms.

JEL classification codes: F10, F12, F14, F23.

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[†]INRA, UMR1302 SMART, F-35000 Rennes, France (Angela.Chepea@rennes.inra.fr)

[‡]Agrocampus Ouest, UMR1302 SMART, F-35000 Rennes, France

[§]CEPII Paris, France (charlotte.emlinger@cepii.fr).

[¶]INRA, UR LERECO, F-44000 Nantes, France (Karine.Latouche@nantes.inra.fr).

1 Introduction

All the worlds' largest retailers have established and multiplied their outlets in foreign countries. This trend has accelerated over the last decade and the struggle for new markets remains on the top of these firms' agenda. The overseas expansion of these multinationals can shape international trade (of home and host countries) in multiple ways. The literature on this subject is new and covers only a limited number of issues.

The pronounced internationalization of major world retailers over the last two decades has given rise to a growing recent literature on this subject. There are four different strands of economic literature focusing on retailers that invest in foreign markets and the resulting impacts on home and host economies.

First, the very process of internationalization in the retail sector is investigated by the literature on managerial sciences and economic geography. The main questions addressed are why do we observe retail internationalization, what forms does it take, how is it different from product globalization (Traill, 2006; Dawson, 2007; Coe & Wrigley, 2007). To answer them, a strategic management and a retail management perspective is adopted.

The overseas expansion of retailers is also studied in industrial economics. This literature focuses on retailers' market power, the degree of sector concentration, and the consequences in terms of competition and employment in host and origin markets. It consists mainly of theoretical papers that try to understand the underlying economic mechanisms (Girma et al., 2008; Eckel, 2009; Raff & Schmitt, 2009, 2011).

Third, the results of the wide literature on foreign direct investments (FDI) can be extrapolated, extended to the retail sector. Helpman (2006) represents an illustrative attempt in this sense. Javorcik & Li (2008), Javorcik et al. (2008), Iacovone et al. (2011) represent other significant contributions.

Finally, multinational retailers have been at the origin of a very recent (and still narrow) stand of international trade literature. For example, Basker & Van (2008) link economies of scale in retail to economies of scale in importing to explain why larger retail chains import disproportionately more than smaller ones from low-cost remote countries. Differently, Nordås et al. (2008) and Head et al. (2010) study how the arrival of multinational retailers shapes host country exports. This literature is closely linked to that on intermediaries in international trade (Antràs & Costinot, 2010; Bernard et al., 2010; Blum et al., 2010; Basker & Van, 2010; Ahn et al., 2011; Antràs & Costinot, 2011).

Multinational retailers have been compared to, or even considered as a form of, intermediaries.

Still, most of the existing literature focuses on the process of internationalization *per se*, the forms it may take, and the ways it may impact host countries, its firms, employees and consumers. In this paper we adopt a different angle of approach and investigate the mechanisms through which retailers that invest abroad contribute to the export competitiveness of their origin countries.

The current paper explores the link between globalization of the retail sector and international trade activities. More precisely, we analyze and measure to what extent domestic exports to a given market are impacted by the implantation of a domestic retailer in this given country. We investigate this relationship empirically using data on bilateral exports for a large panel of countries and data on the foreign sales of the top one hundred world's retailers over the 2000-2010 decade. We use an instrumental variables approach in order to control for a simultaneity and an endogeneity bias, both bilateral exports and retailers' sales being determined by a number of common observed and non-observed factors. Bilateral retail investments arise only for a small share of country pairs in our data. In order to address this feature of the data, in addition to the traditional instrumental-variables approach used in most of the empirical trade literature, we use generated instruments (Wooldridge, 2001, 2010, computed following) that take into account the specific distribution (partially continuous and partially discrete) of our endogenous variable.

We find confirmation of the positive effect of the overseas presence of a country's retailers on its exports to those markets. The effect increases in magnitude with the volume of retailers' sales in the importing country. Note that this outcome is far from being trivial, since most retailers sell locally-produced goods in their foreign outlets. It reveals that when a country's retailers establish or intensify operations abroad, domestic firms exporting to those markets experience a drop in their trade costs.

Our finding can be explained by four mechanisms or intuitions. First, retailers implanted in another country may choose to continue to work with their domestic suppliers. Second, domestic exports can benefit from informational externalities. Third, retailers implanted abroad can also influence consumer demands on foreign markets. Fourth and more globally, the implantation of domestic retailers abroad may also impact the global image of the domestic country in the destination country and then improve sales of domestic exporters (not only retailer suppliers).

The paper is structured as follows. The next section discusses stylized facts relative to the world's largest retailer companies. The empirical model is detailed in section 3. Employed data, the econometric approaches and main results are discussed in section 4. In section 4.4 we perform two

robustness checks: we test our results (i) using different sets of instrumental variables, and (ii) replacing importer and exporter fixed effects with countries' GDPs and approximations of multilateral resistance terms. The last section resumes our conclusions.

2 Stylized facts

The internationalization of retail companies is not a recent phenomenon. Carrefour established its first outlet in Belgium in 1969 and Wal-mart arrived in Mexico in 1991. However, foreign investment in the retail sector experienced an acceleration during the last decade. The main drivers of this process cited in the literature are the overall globalization, the development of emerging economies and the saturation of retailers' domestic markets (Evans et al., 2008; Reardon et al., 2003). Figure 1 draws the evolution of world sales by multinational retailers whose sales abroad increased by at least 150% between 2000 and 2010.¹ This trend was only slightly inferior to that of food exports of retailers' origin countries.

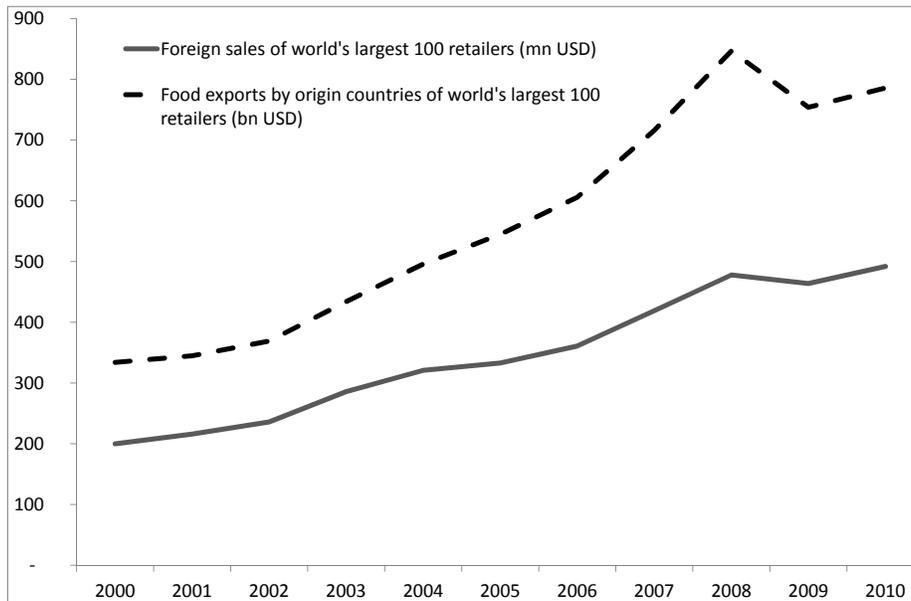


Figure 1: World retail sales in foreign markets

Source: Authors's calculation using data from Planet Retail. Figures on the vertical axis are in mn USD.

The internationalization of the retail sector concerns companies of few geographical origins.

¹Domestic sales of these companies increased on average by 110% over the same period.

Table 1 presents descriptive statistics about state of art in the retail sector in 2010, using data from the Planet Retail database. This database provides data on the sales of world' top one hundred retailers in domestic and foreign markets, at company level.² The database covers the period from 2000 to 2010 and retailer's sales in each market where it operates. Even if the information from Planet Retail is not exhaustive, since the retail sector is highly concentrated (Reardon et al., 2003), we can consider our dataset as almost exhaustive. This assumption is particularly verified with respect to internationalization, a process that concerns essentially the largest firms in the sector. From these data we conclude that half of retailers' sales in the foreign markets are made by German and French companies. Moreover, these retailers are characterized by a high degree of internationalization, with over 40% of their total sales coming from abroad. The overall leading position of American retail companies (27% of world sales) is due essentially to the US domestic market. Indeed, only 9 out of 21 US retailers in the database have outlets in foreign markets, and their sales in these outlets represent only 17% of US retailers' total sales. Some smaller countries, such as the Netherlands, Belgium and Hong Kong, have highly internationalized retail companies with more than 60% of the turnover resulting from sales in foreign markets.

American and German retail companies have increased their shares of the world market over the last decade (excluding sales in domestic markets, Figure 2). Retailers of these two origins have either increased the number of their outlets in foreign market, or their sales in existing outlets. At the same time, French companies have maintained their overall market share, while Dutch and Belgian companies lost market share in foreign markets.

The overseas expansion of multinational retailers is a phenomenon involving mainly rich countries: 76% of sales of the world's largest retail companies are made in high-income countries (Table 2). Still, the share of sales in outlets located in the main five emerging countries (Brazil, Russia, India, China and South Africa - abbreviated BRICS) increased continuously: it doubled from 2000 to 2010 to reach 12%. With the increasing liberalization of the retail sector in these countries, especially in India, we expect this trend to continue in the years to come. Developing countries represented about 12% of the foreign sales of retail companies in 2010, only two percentage points more than a decade earlier. Finally, least developed countries (LDC) lag behind other destination markets, absorbing less than one percent of the foreign sales in retailing. This indicates that LDC are literally excluded from the internationalization of the retail sector.

²The origin, or the nationality, of retail companies have been added using information available on companies' websites. Mergers and acquisitions are taken into account only if it implies a change of the the name of outlets. We consider only firms with a single origin country.

Table 1: Internationalization of world’s largest retailers, by country of origin

Origin country of retail companies	Sales in foreign markets, USD	Share of sales in foreign markets	Share of the world market (excluding sales in domestic markets)	Number of retail companies	Number of retailers operating abroad
Germany	134	45%	27%	7	7
France	113	41%	23%	6	6
USA	84	17%	17%	21	9
Netherlands	44	78%	9%	2	2
United Kingdom	28	20%	6%	7	4
Belgium	26	63%	5%	3	3
Japan	16	10%	3%	6	5
Hong Kong	9	72%	2%	2	2
Portugal	6	58%	1%	1	1
Chile	5	56%	1%	1	1
Australia	5	5%	1%	3	3
Austria	5	46%	1%	1	1
Ireland	4	48%	1%	1	1
Denmark	4	17%	1%	3	1
Norway	4	18%	1%	2	1
Slovakia	3	70%	1%	1	1
Korea	2	11%	0%	2	2
South Africa	1	8%	0%	2	2
Finland	1	4%	0%	2	2
China	0.4	2%	0%	2	1
Switzerland	0.2	1%	0%	2	1
Spain	0.1	0%	0%	3	1
Italy	0.1	0%	0%	3	2
Russian Federation	0.03	0%	0%	1	1
Sweden	0.001	0%	0%	1	1
Canada	-	0%	0%	3	
New Zealand	-	0%	0%	1	
United Arab Emirates	-	0%	0%	1	
Puerto Rico	-	0%	0%	1	
Total	492	26%	100%	91	61

Source: Authors’s calculation using data from Planet Retail.

Table 2: Destination of sales of world’s largest retailers

	High income countries	BRICS	Developing countries	LDCs	Total
Share in 2000	85%	6%	10%	0.04%	100%
Share in 2010	76%	12%	12%	0.06%	100%
Sales growth rate	121%	452%	204%	236%	147%

Source: Authors’s calculation using data from Planet Retail.

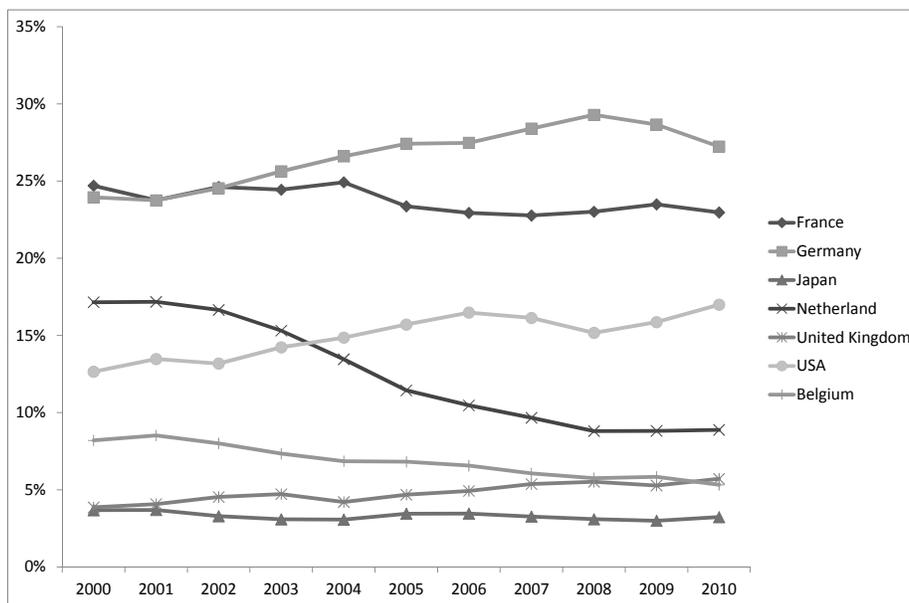


Figure 2: Shares of the world market in the retail sector, by the origin country of retailers
 Source: Authors's calculation using data from Planet Retail.

When we look at the specific host countries targeted by different multinational retailers, we see a clear geographical specialization (Table 3). Thus, most of the foreign outlets of retailers from Germany, Belgium and the Netherlands are in high income countries, mainly in Europe. On the contrary, a significant share of French and American companies' sales come from the BRICS and other developing countries. In particular, Brazil and China constitute two strategic markets for French retailers, with respectively 19 and 7% of their sales abroad. The same is also true for US retailers, even if their sales in the neighbor Mexican market account for 20% of their sales. We note that French retailers are the only ones to establish operations in least developed countries and North Africa, mainly due to their common colonial past. The stylized facts emphasized in this section suggest that both geographical and strategic components determine the decision of retailers to open outlets and increase sales in foreign markets. The high income growth of emerging countries is one of the factors explaining the increasing internationalization of retailers.

3 The empirical model

We consider a trade structure with a differentiated good and n_{it} varieties produced in each country i . Product differentiation can be at country or firm level. Consumer preferences are homothetic and

Table 3: Host countries of foreign retail establishment, by level of income and companies' origin

	High income countries	BRICS	Developing countries	LDCs	Total
Belgium	100%	0%	0.4%	0%	100%
France	56%	31%	13%	0.10%	100%
Germany	92%	4%	3%	0%	100%
Japan	81%	8%	11%	0%	100%
Netherland	87%	5%	8%	0%	100%
United Kingdom	78%	5%	17%	0%	100%
USA	58%	14%	28%	0%	100%

Source: Authors's calculation using data from Planet Retail.

represented by a CES utility function. The difference in the price of the same good in two different locations is entirely explained by the difference in trade costs to these locations. For simplicity we assume an *iceberg* trade costs function: the price to country j consumers of a good produced in i , p_{ijt} , is the product of its mill price p_{it} and the corresponding trade cost τ_{ijt} . Consumers of each country j spend a total amount E_{jt} on domestic and foreign products and choose quantities that maximize their utility function under the budget constraint. Country j 's total demand for country i products at time t is similar to the one obtained by Anderson & van Wincoop (2003) and Anderson & van Wincoop (2004):

$$m_{ijt} \equiv x_{ijt}p_{ijt} = a_{ij}^{\sigma-1} \left(\frac{p_{it}\tau_{ijt}}{P_{jt}} \right)^{1-\sigma} n_{it}E_{jt}, \quad (1)$$

$$\text{where} \quad P_{jt} \equiv \left[\sum_k a_{kj}^{\sigma-1} (p_{kt}\tau_{kjt})^{1-\sigma} n_{kt} \right]^{\frac{1}{1-\sigma}} \quad (2)$$

is a price index of the importing country j nonlinear with respect to the elasticity of substitution (unknown parameter) σ . The estimation of equations (1)-(2) is possible only for particular values of the substitution elasticity σ . But even then, the presence of a non linear price index P_{jt} , and the difficulty of measuring the number of varieties produced in each country limit the accuracy of results.

Consumer preferences can also be expressed as a function of bilateral variables, similar to trade costs. However, we have no means to disentangle the impact of the same variable on preferences from its impact on trade costs. Estimated coefficients on the latter will actually reflect the global effect on both trade costs and consumer preferences. For simplicity, we assume throughout the rest of the paper identical preferences for all products and consumers and interpret any increase

(drop) in the term (τ_{ijt}/a_{ij}) as a reduction (raise) of trade costs. Alternatively, one could consider that an identical equally-priced good from source country s is perceived differently by consumers in country i and consumers in country j . A strong (weak) taste for good s leads consumers to overvalue (undervalue) the virtues of the product and shifts their demand function upward (downward). Thus, the actual price to which consumers in country j respond is $a_{sj}^{\sigma-1}p_{sjt}$ rather than p_{sjt} .

The trade specification to be estimated is derived directly from (1) by grouping i and j terms of the equation and taking logarithms on both sides:³

$$\ln m_{ijt} = FE_{it} + (1 - \sigma) \ln \tau_{ijt} + FM_{jt}, \quad (3)$$

Country fixed effects are used as proxies for price-adjusted supply and demand terms of the equation with $FE_{it} \equiv \ln(n_{it}p_{it}^{1-\sigma}) + \ln(a_{ij}^{\sigma-1})$, and $FM_{jt} \equiv \ln(E_{jt}P_{jt}^{\sigma-1})$.

We adopt the following trade costs equation:

$$\ln \tau_{ijt} = \delta \ln d_{ij} + b_1 contig_{ij} + b_2 colony_{ij} + b_3 landlock_i + b_4 landlock_j + c \ln SALES_{ijt} \quad (4)$$

d_{ij} represents the physical distance separating countries i and j . It increases trade costs and we expect the data to confirm that $\delta > 0$. Variables $contig_{ij}$ and $colony_{ij}$ denote respectively a common land border and a common colonial history for countries i and j , while variables $landlock$ indicate the absence of access to the sea/ocean. We expect coefficients b_1 and b_2 to be negative (diminish trade costs, facilitate/foster trade), and coefficients b_3 and b_4 to be positive (hinder, restrain trade). The last term $SALES_{ijt}$ reflects the sales of domestic, local and foreign products by multinational retailers from country i in outlets they established in host market j . We believe that the presence of retailers from i in foreign markets helps other firms from country i to export at lower cost to these markets. This effect arises for domestic firms that interact directly with (supply) multinational retailers, as well as for other domestic firms, the latter through the different channels discussed previously in the paper. This effect is similar to the one analyzed by Ahn et al. (2011).

The trade equation to be estimated is obtained by integrating the trade costs function (4) in

³Rose & van Wincoop (2001) and Redding & Venables (2004) also use country-specific effects to capture importer and exporter variables of a trade equation.

equation (3):⁴

$$\ln m_{ijt} = FE_{it} + FM_{jt} + \alpha \ln d_{ij} + \beta_1 \text{contig}_{ij} + \beta_2 \text{colony}_{ij} + \beta_3 \text{landlock}_i + \beta_4 \text{landlock}_j \quad (5) \\ + \gamma \ln SALES_{ijt} + \varepsilon_{ijt}.$$

4 Retailers' overseas expansion and bilateral exports

4.1 Data

The data panel used in this paper covers bilateral trade between a large number of exporting (171) and importing (101) countries over the 2000-2010 period.

Our main variable of interest is $SALES_{ijt}$ that corresponds to the total sales of retailer from country i in outlets established in country j . We compute this variable using data from the Planet Retail dataset ⁵ we used for the descriptive statistics of the section 2. The original dataset gives grocery sales by retail company and country, for the first 100 retail companies. We aggregated these data in order to have the sales of all the companies of country i in host country j .⁶

For trade data, we use the BACI database developed by the CEPII.⁷ BACI's trade data are defined at the 6-digit level of the HS nomenclature. We aggregated the trade value data at the country level in order to have only one trade value by exporter i and importer j . We only consider trade of food products sold in supermarkets.⁸

At the global level, foreign investments in the retail sector are a relatively rare phenomenon. In order to better illustrate the impact of retailers' sales in foreign markets on their origin countries' exports we limit our panel to exporting countries whose retailers sell at least in one foreign market and importing countries that host at least one foreign retailer. Even doing so, the observations with positive sales of multinational retailers of origin i in destination market j represent only 2.3% of the data.

We use GDP of exporting and importing countries from the World Development Indicator of the World Bank. Distance and the other geographical variables (landlocked, contig and Colony)

⁴ $\alpha = (1 - \sigma) \delta$, $\beta_1 = (1 - \sigma) b_1$, $\beta_2 = (1 - \sigma) b_2$, $\beta_3 = (1 - \sigma) b_3$, $\beta_4 = (1 - \sigma) b_4$, $\gamma = (1 - \sigma) c$.

⁵ <http://www1.planetretail.net/>

⁶ see section 2 for details

⁷Gaulier & Zignago (2010) This database uses original procedures to harmonize the United Nations COMTRADE data (evaluation of the quality of country declarations to average mirror flows, evaluation of cost, insurance and freight (CIF) rates to reconcile import and export declarations)

⁸Thus, from the first 24 chapters of the Harmonized System which correspond to food products, we exclude Live animals (chapter 1), Hairs, furs and Ivory (chapter 5), Flowers (chapter 6), Raw Cereals (chapter 10), Vegetal extracts (chapter 13), Plaiting materials (chapter 14), Food residues (chapter 23) and Tobacco (chapter 24).

come from the CEPII’s geodist database.⁹ Tariff data comes from the MACMap-HS6 dataset and is available only for three years: 2001, 2004 and 2007.¹⁰ This database gives ad-valorem equivalents of tariff protection for each importer, exporter and product defined at the 6-digit level of the HS nomenclature. These ad-valorem equivalents have been aggregated using a trade weighted average, in order to have only one ad-valorem equivalent by country pairs, corresponding to the average protection for our group of food products.

4.2 Different econometric approaches

The objective of this section is to identify the econometric techniques that allow to correctly estimate how the presence of multinational retailers from country i in country j affects the volume of exports from i to j . Equation (5) suggests the existence of a positive effect: the amount of sales of country i retailers in j , $SALLES_{ijt}$, should have a significant and positive impact on bilateral exports, m_{ijt} . However, the two variables have a common set of observed and non-observed determinants. Thus, both exports and retail investments increase with the economic size (market potential) of the destination country, the cultural, linguistic and historical ties linking the origin and destination countries. Therefore, estimating equation (5) directly with ordinary least squares (OLS) may yield results biased by an endogeneity (simultaneity) problem.

To eliminate this endogeneity bias and obtain a correct estimation of the causality effect between variables $SALLES_{ijt}$ and m_{ijt} , we use an instrumental variable approach. We identify three exogenous variables that affect the decision to invest abroad or the amount of sales in outlets located abroad, but not the volume of bilateral exports. First, we consider the share of women in active workers in the host country. The data on this variable comes from the World Development Indicators database of the World Bank. Women’s employment is supposed to entail the development of supermarket and retail, in particular in developing countries (Reardon et al., 2003). As a second instrument, we use the cost of administrative procedures supported by a foreign company when establishing a new business in the host country. Data on this indicator is obtained from the Doing Business database¹¹ and is expressed in USD. Fixed investment costs are larger in countries with high administrative costs (red tape), leading to lower levels of foreign investment, i.e. to a smaller number of outlets operated by foreign retailers in the host country. Since retailing is a proximity service, fewer outlets also means a lower volume sales by foreign retailers in a particular host

⁹Mayer & Zignago (2011).

¹⁰Guimbard et al. (2012) for a description of the dataset.

¹¹ <http://www.doingbusiness.org/>

country. The last instrument we employ is the share that retailers from the origin country have on the domestic market. We compute this variable using the Planet Retail database, under the assumption that retail companies are more eager sell abroad when they already have a high share of the domestic (origin country) market. Retailers expand overseas in their quest for new consumers, virtually inexistent in the domestic market (Reardon et al., 2003). To reduce endogeneity, we use lagged values (by one year, in $t - 1$) of all our instruments.

The three instrumental variables described above can be used such as to construct the standard two-stage least squares (2SLS) estimator of parameters in equation (5). This represents the traditional econometric approach that allows to control for endogeneity/ simultaneity between explained and explanatory variables. In addition to it, we consider two other 2SLS estimators that take into account the specific distribution of the instrumented variable $SALES_{ijt}$. Rather than using directly the set of instrumental variables to control for the endogeneity of retailers' sales in foreign markets, we instrument $SALES_{ijt}$ with its best prediction one can obtain using the vector of exogenous variables from equation (5), X_{ijt} , and the set of instrumental variables, Z_{ijt} : $\widehat{SALES}_{ijt} = E(SALES_{ijt}|X_{ijt}, Z_{ijt})$. Variable $SALES_{ijt}$ takes the value zero for a large number of observations in our dataset. As mentioned earlier in the paper, foreign investment in the retail sector is a relatively rare phenomenon, even when we limit the data panel to exporting countries whose retailers sell at least in one foreign market and to importing countries that host at least one foreign retailer. We take into account this partially-continuous and partially-discrete distribution of variable $SALES_{ijt}$ when computing $E(SALES_{ijt}|X_{ijt}, Z_{ijt})$. First, we assume that variable $SALES_{ijt}$ follows a standard Tobit model and use the corresponding maximum likelihood estimator. Second, we use a Heckman estimator that allows the three instrumental variables identified above to explain differently the occurrence (the discrete part of $SALES_{ijt}$) and the volume (the continuous part of $SALES_{ijt}$) of retailers' sales in foreign markets. Instruments $\widehat{SALES}1_{ijt}$ and $\widehat{SALES}2_{ijt}$, generated with Tobit and Heckman estimators, are used alternatively instead of Z_{ijt} in a two-stage least squares procedure to obtain the coefficients of equation (5). This estimation technique is consistent with the approach proposed by (Wooldridge, 2010)[p.117].

Another difficulty in our estimations is the fact that the use of country and partner fixed effects (as suggested by the theoretical model and the recent practice in empirical literature on international trade) explain a large degree of the nil retail sales observations, which considerably lowers our degrees of freedom and makes our results valid only for the considered sample. To overcome this situation, we replace country-specific effects with region-specific effects.

4.3 Main estimation results

In this section we present the results obtained from the estimation of equation (5) using data presented in section 4.1 and the econometric approaches described in section 4.2.

Table 4 shows the estimates of coefficients in equation (5) using five alternative specifications. In all specifications, we use importer and exporter GDPs to proxy for the size of demand and supply in the two countries. The geographical distance and dichotomous variables for common land border, past colonial ties and the fact of being landlocked are used to account for unobservable bilateral trade costs. The main variable of interest in this study is the sales of retailers in foreign markets, $SALES_{ijt}$. Its coefficient indicates whether an increase in the sales of a country's retailers in a foreign market allows to other firms of the same origin to export more (and at lower costs) to these destination. Importer and exporter fixed effects for eleven geographical zones and year fixed effects are included in all specifications.

Results obtained by estimating trade equation (5) with OLS are displayed in the first column of Table 4. The coefficients of traditional variables are highly significant and in line with values obtained by previous studies in the literature. The size of origin and destination countries, geographical contiguity and the existence of a common colonial history enhance bilateral exports. Conversely, remote countries and countries without access to the sea exchange significantly less than an average pair of countries. We find a positive and significant coefficient for the sales of retailers in foreign markets. Nevertheless, as explained in the previous section, this coefficient may be biased because of the endogeneity of the variable.

The second column shows coefficients obtained with the two-stage least squares (2SLS) estimator. The Hausman test is highly significant, confirming the endogeneity of the variable of interest, $SALES_{ijt}$. The classical tests for endogeneity (Sargan and Cragg-Donald statistics) validate our choice of instrumental variables. When we control for this aspect, the coefficient of variable $SALES_{ijt}$ increases by more than tenfold from 0.02 to 0.27. As an illustration, this result suggests that a ten percent increase in the volume of French retailers' sales in a foreign market would induce a 2.5 percent increase in the exports of French firms to this country. The impact on exports of other variables remains almost unchanged.

The next two columns of Table 4 correspond to 2SLS estimates, where the endogeneity of $SALES_{ijt}$ is controlled for with instruments generated using first-stage Tobit and, respectively, Heckman estimators. The magnitude of the effect of variable $SALES_{ijt}$ on the exports of country

i to destination j estimated with these two methods is very similar to the one obtained in column (2).

Finally, in column (5) we replicate the 2SLS estimates from column (2) on equation (5) augmented with the import tariff, $\ln(1 + \text{tariff}_{ijt})$, where tariff_{ijt} is the ad-valorem equivalent of import tariffs on goods exported by country i to destination j . Data on tariffs are available only for 3 years, leading to an important drop in the number of observations. We obtain a negative and highly significant coefficient on import tariff, in accordance with the existing theoretical and empirical literature. Import tariffs enter the trade costs function with coefficient one. Therefore, the corresponding coefficient in column (5) allows us to deduce the magnitude of the elasticity of substitution between exchanged products σ : 2.92. The impact of the variable $SALES_{ijt}$ on bilateral exports is very similar to the ones obtained with the other 2SLS estimators.

To sum up, the different specifications presented in Table 4 testify of a positive and significant impact of the intensity of multinational retailers's sales in foreign markets on the exports of their origin countries to these markets. Taking into account endogeneity enhances this effect. Several economic mechanisms may explain this finding.

First, *retailers that penetrate foreign markets may continue to source from domestic suppliers for their overseas stores* (at least at the beginning). In this case retailers pass on to their suppliers in the home country the information they learn about foreign (host country) demand and competition by giving the latter precise instructions about the necessary changes in the product range, presentation, marketing, etc. This would yield a one-to-one relationship (perfect pass-through) between the increase in retailers' sales and its home country's exports to the same market. The effect diminishes (and eventually vanishes) as retailers decide to source locally and switch from home to host country suppliers.

Second, the presence of home country retailers on foreign markets may reinforce exports of multinational firms by generating *information spillovers*. After several years of selling their products via the retailer's overseas network of outlets, a supplier may decide to export directly their products (and eventually buy cheaper shelf space from a local retailer). Domestic firms (suppliers) willing to internationalize may also hunt for managers working for multinational retailers and use their knowledge (expertise) of foreign markets in order to incur lower fixed (sunk) costs of exporting.¹²

¹²[It is not unusual that managers provide consulting services to other firms or even switch firms when offered better positions.] This practice is often employed by firms since acquiring information about foreign markets is a long and costly process, while employing a senior management that has already has knowledge of and connections in this environment permits to cut costs by an important amount.

Table 4: The impact of multinational retailers' sales in foreign markets on home country exports

	Explained variables: m_{ijt}				
	(1)	(2)	(3)	(4)	(5)
ln GDP exporter	0.96*** (0.01)	0.87*** (0.01)	0.88*** (0.01)	0.90*** (0.01)	0.85*** (0.02)
ln GDP importer	0.75*** (0.01)	0.71*** (0.01)	0.71*** (0.01)	0.69*** (0.01)	0.71*** (0.02)
ln distance	-1.30*** (0.01)	-1.20*** (0.02)	-1.21*** (0.02)	-1.16*** (0.02)	-1.20*** (0.05)
contiguity	0.96*** (0.05)	0.68*** (0.08)	0.71*** (0.08)	0.74*** (0.09)	0.63*** (0.19)
colony	1.57*** (0.05)	1.02*** (0.08)	1.07*** (0.08)	0.98*** (0.09)	1.15*** (0.19)
landlock exporter	-0.61*** (0.02)	-0.61*** (0.04)	-0.62*** (0.04)	-0.37*** (0.04)	-0.60*** (0.09)
landlock importer	-0.61*** (0.03)	-0.75*** (0.04)	-0.75*** (0.04)	-0.68*** (0.05)	-0.71*** (0.01)
ln sales by multinational retailers	0.02*** (0.00)	0.27*** (0.02)	0.24*** (0.02)	0.25*** (0.02)	0.25*** (0.04)
ln (1 + tariff)					-1.92*** (0.25)
Nb obs.	98292	43411	43411	34577	8561
R^2 , centered	0.52	0.46	0.46	0.46	0.46
R^2 , uncentered		0.9	0.9	0.9	0.9
Sargan statistic		0.88			1.70
Sargan p -value		0.645			0.428
Weak identification statistic		979.54	3083.08	2083.80	187.69
cd		0.068	0.071	0.06	0.066
id statistic		2754.52	2880.80	1967.08	530.31
id p -value		0.000	0.000	0.000	0.000
ln likelihood	-229280.86	-103227.89	-102924.18	-82379.21	-20365.95

Notes: Authors's estimations using data from Planet Retail. Estimations in all columns include exporter and importer geographical zones fixed effects and year fixed effects.

The success and failures of domestic retailers in foreign markets is usually closely followed by the mass-media in its origin country, where it makes most of its sales and profits. This is another source of cheap information that co-national firms may explore in their decision to enter (sell to) the same markets. The successful entry of a foreign market by a domestic retailer signals to its domestic suppliers the potential for increased sales and profits on that market.

Third, recent studies show that multinational retailers not only adapt to each market they enter, but also may *shape local consumption habits*. Due to their large size, continuous presence and

repeated contact with local customers, they may "educate" (accustom) the latter to the consumption culture or even life style of their origin country and "create" demand. For example, the rising Chinese demand for wines is not uncorrelated to the fact that Chinese consumers may purchase French wines in Carrefour outlets in China. Similarly, the arrival of Wal-mart may be associated to (followed by) an increasing demand for sodas (Coca-Cola, Pepsi, etc.) and high-calorie products. We believe this effect of foreign retailers on host country consumers' habits are particularly strong in the case of food products.¹³

Moreover (fourth), following the same line of reasoning, a retailer that settles abroad represents to local consumers, firms, officials and institutions (through its policy towards workers, local authorities, customers, etc.) the very values and culture of its home country. Therefore, a multinational retailer also *publicizes a good or poor image/reputation of its country of origin*, which translates by the end of the day into a higher or lower local demand for products of this origin. The previous three channels via which retail investment generates exports towards the same host country concern mainly the retailer's suppliers in the home country. Differently, an improved or a deteriorated image of the origin country that a retailer disseminates on foreign markets will affect the demand for goods exported by all its co-national firms to these markets.

All the mechanisms discussed above can be modeled as a reduction in sunk exporting cost for home country suppliers of retail chains that start selling overseas. Lower sunk costs allow to a larger share of domestic firms to export their products to the foreign market, with in the end increases the volume of origin country exports to this destination.

4.4 Robustness of results

4.4.1 Different instrumental variables

As a robustness check, we estimate equation (5) with alternative instrumental variables. To instrument $SALES_{ijt}$, we use the number of retail companies in the exporting country i and the growth rate of total retail sales in the host country j . We compute these two variable using the Planet Retail database and as previously, we use lagged variables. The results are robust to this new specification.

¹³Culinary cultures vary significantly across countries and there is higher potential to create new demand when foreign products are very different from domestic ones than when they are close substitutes.

4.4.2 Approximations of multilateral resistances

In section 4 we used importer and importer fixed effects to control for multilateral remoteness terms. In the present subsection, instead of fixed effects, we include approximations of these terms compatible with their definition in theoretical trade models.

Anderson & van Wincoop (2003) show that under market clearance, the exporter-specific term is equal to the product of the country's outcome Y_{it} and a CES price index Π_{it} , computed similarly to P_{jt} : $n_{it}p_{it}^{1-\sigma} = Y_{it}\Pi_{it}^{\sigma-1}$.¹⁴ Accordingly, if one could measure importer and exporter price indices P_{jt} and Π_{it} (also known as outward and inward multilateral resistance terms), estimating the impact of different trade costs elements on the volume of trade would become straightforward:¹⁵

$$\ln m_{ijt} = \ln Y_{it} + \ln E_{jt} + (1 - \sigma) \ln \tau_{ijt} + (\sigma - 1) \ln \Pi_{it} + (\sigma - 1) \ln P_{jt} + e_{ijt} \quad (6)$$

Ad-hoc formulas for computing multilateral resistance terms P_{jt} and Π_{it} abound in the empirical trade literature. Recently, Baier & Bergstrand (2009) proposed an alternative method, based on that a first-order log-linear Taylor-series expansion of these terms as they are defined in the theory:

$$MR_{kt} = \sum_s \theta_{kt} \ln \tau_{skt} - \frac{1}{2} \sum_k \sum_s \theta_{st} \theta_{kt} \ln \tau_{skt}, \quad \forall k, s = i, j \quad (7)$$

We follow their approach and estimate equation (6) using exporter and importer GDPs as proxies for supply and demand effects Y_{it} and E_{jt} . Multilateral resistance (MR) terms are obtained by integrating the trade costs function (4) in equation (7); they are the same for each country, whether it acts as exporter or importer. θ_{kt} and θ_{st} are the shares of countries k and s in world GDP, and the overall multilateral resistance for trade between any pair of countries i and j is the sum of exporter and importer multilateral resistances. The resulting expression of MR_{kt} depends on unknown parameters δ , b_0 to b_4 and c (see equation (4)). Therefore, multilateral resistance terms cannot be computed directly. To overcome this difficulty, a multilateral resistance term is computed for each element x of the trade costs function:

$$MR_{-}x_{ijt} = \sum_j \theta_{jt} x_{ijt} + \sum_i \theta_{it} x_{ijt} - \sum_i \sum_j \theta_{it} \theta_{jt} x_{ijt}, \quad (8)$$

$$\forall x_{ijt} = \{\ln d_{ij}; \ln(1 + \text{tariff}_{ijt}); \text{contig}_{ij}; \text{colony}_{ij}; \text{landlock}_i; \text{landlock}_j\}.$$

¹⁴The market clearing assumption ($E_{jt} = Y_{jt}$) is often verified by aggregate data.

¹⁵Equation (3) could be estimated without exporter and importer fixed effects.

Note that when the set of variables MR_x_{ijt} replaces true multilateral resistances in equation (6), the coefficient corresponding to each variable is exactly the opposite of the coefficient of the corresponding trade costs element x_{ijt} . Accordingly, the resulting equation is:

$$\begin{aligned}
\ln m_{ijt} = & a_0 + a_1GDP_{it} + \alpha_2GDP_{jt} + \lambda_1 \ln d_{ij} - \lambda_1MR_ \ln d_{ij} \\
& + \lambda_2contig_{ij} - \lambda_2MR_contig_{ij} + \lambda_3colony_{ij} - \lambda_3MR_colony_{ij} \\
& + \lambda_4landlock_i - \lambda_4MR_landlock_i + \lambda_5landlock_j - \lambda_5MR_landlock_j \\
& [+ \lambda_6 \ln(1 + tariff_{ijt}) - \lambda_6MR_ \ln(1 + tariff_{ijt})] + \gamma \ln SALES_{ijt} + \epsilon_{ijt}
\end{aligned} \tag{9}$$

where $\lambda_1 = (1 - \sigma) \delta$, $\lambda_2 = (1 - \sigma) b_1$, $\lambda_3 = (1 - \sigma) b_2$, $\lambda_4 = (1 - \sigma) b_3$, $\lambda_5 = (1 - \sigma) b_4$, and $\lambda_6 = (1 - \sigma)$. We estimate equation (9), with and without tariffs, under constraints in order to obtain the desired coefficients.

Equation (9) is estimated according to the five approaches used in section 4.3. The same instrumental variables as in section 4.3 are used to control for the endogeneity of multinational retailers' sales in foreign markets. Obtained coefficients are reported in Table 5. Each column corresponds to the same econometric approach used in Table 4. Again, we find a positive and significant effect of retailers' sales in foreign markets on bilateral exports of its origin country. The magnitude of the effect is very similar to that in Table 4. The coefficients of standard trade model variables (except for landlocked importer and exporter) in the two tables are also very close. Overall, this confirms the robustness of our findings.

5 Conclusions

The current paper explores the link between globalization of the retail sector and international trade activities. More precisely, we analyze and measure to what extent exports to a given market are impacted by the sales of domestic retailer in this country. To address this question, we consider an empirical trade model, where the foreign sales of multinational retailers reduce the fixed and variable trade costs of other domestic firms to the same destination markets. We test our model with data on bilateral exports of agri-food products on a large panel of countries and on the foreign sales of world's largest one hundred retailers over the 2001-2010 decade.

The direct estimation of the impact of retailers' sales in foreign on exports with OLS may be biased because both variables (retailers investments abroad and exports) are explained by a

Table 5: Robustness of impacts: multilateral remotenesses

	Explained variables: m_{ijt}				
	(1)	(2)	(3)	(4)	(5)
ln GDP exporter	0.91*** (0.00)	0.83*** (0.01)	0.84*** (0.01)	0.83*** (0.01)	0.80*** (0.02)
ln GDP importer	0.84*** (0.00)	0.77*** (0.01)	0.77*** (0.01)	0.77*** (0.01)	0.75*** (0.02)
ln distance	-1.15*** (0.01)	-1.10*** (0.02)	-1.11*** (0.02)	-1.10*** (0.02)	-1.05*** (0.05)
contiguity	0.65*** (0.05)	0.40*** (0.09)	0.43*** (0.09)	0.41*** (0.09)	0.33* (0.20)
colony	0.93*** (0.05)	0.85*** (0.08)	0.86*** (0.08)	0.85*** (0.08)	0.86*** (0.19)
landlock exporter	-1336.28*** (53.85)	-1605.60*** (98.54)	-1607.58*** (98.01)	-1605.95*** (98.48)	-1265.49*** (156.57)
landlock importer	-447.36*** (59.44)	-673.57*** (107.84)	-664.30*** (107.25)	-672.78*** (107.78)	-606.78*** (173.56)
ln sales by multinational retailers	0.06*** (0.00)	0.30*** (0.02)	0.27*** (0.02)	0.29*** (0.02)	0.35*** (0.04)
ln (1 + tariff)					-1.62*** (0.30)
Nb obs.	98336	43427	43427	43427	8789
R^2 , centered	0.45	0.39	0.40	0.39	0.37
R^2 , uncentered		0.88	0.89	0.88	0.88
Sargan statistic		14.49			4.53
Sargan p -value		0.001			0.104
Weak identification statistic		995.86	3053.76	2983.51	184.77
cd		0.069	0.070	0.069	0.063
id statistic		2796.19	2853.93	2792.49	522.10
id p -value		0.000	0.000	0.000	0.000
ln likelihood	-235719.93	-105821.10	-105585.67	-105793.66	-21610.80

Notes: Authors's estimations using data from Planet Retail. Estimations in all columns include exporter and importer geographical zones fixed effects and year fixed effects.

set of common factors. To deal with this endogeneity problem, we use an instrumental variable approach. Apart from the traditional 2SLS estimator, we propose two additional estimations using instrumental variables. We use a Tobit and a Heckman first-stage estimator to generate instruments for the volume of retailer's sales in a foreign country that we use in second-stage estimations. This approach takes into account the specific distribution (partially-continuous and partially-discrete) of our endogenous variable.

We find a positive effect of the overseas presence of a country's retailers on its origin country

exports to those markets. A ten percent increase in the volume of retailers' sales in the importing country yields a 2.5% increase in the exports of retailers' origin country to that destination. This outcome is far from being trivial, since most retailers sell locally-produced goods in their foreign outlets. This result is robust to different specifications, the use of different sets of instrumental variables, and the use of pre-computed approximations of remoteness terms.

We identify four different channels that may explain the pro-trade effect of retailers' overseas expansion. Further research using firm level data is needed to evaluate the relative importance of these channels. In particular, we need to separate the effects on the exports of retailers' suppliers in the domestic market from the effects for other firms from retailers' origin country. We expect the effect to be higher for the former type of firms, and selling through a retailers foreign network to be a privileged way of exporting to new markets. Although information on retailers' suppliers is highly confidential, data on the certification of agri-food firms may be a good way to overcome this difficulty.

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6 Appendix

Table 6: Geographical area fixed effects

Geographic area	Geographic area
European Union (27)	Northern Africa
Rest of Europe	Sub-Saharan Africa
Northern America	North-Eastern Asia
Central and Southern America	South-Eastern Asia
Community of Independent States	Southern Asia and Pacific
Middle East	Oceania