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Multinational Retailers and Home Country Exports

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Multinational Retailers and Home Country Exports

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. 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 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

JEL Classification: F10, F12, F14, F23

La grande distribution multinationale et les exportations des pays d'origine

Résumé

Ce papier étudie si les exportations de produits alimentaires vers un marché étranger sont affectées par l'implantation dans ce pays d'une chaine de grande distribution domestique. Pour répondre à cette question, nous utilisons un modèle empirique d'échanges de type gravitaire. Nous testons le modèle sur le commerce bilatéral d'un large panel de pays et les ventes à l'étranger des cent plus grosses chaines de distribution du globe sur la période 2001-2010. Nos résultats indiquent un impact positif et significatif de la présence à l'étranger des distributeurs d'un pays sur les exportations de leurs pays d'origine. Cet effet est loin d'être trivial, car la plupart des ventes de la grande distribution dans ses implantations à l'étranger sont des produits locaux. Il suggère plutôt que l'investissement à l'étranger dans le secteur de la distribution améliore l'accès d'autres firmes du pays d'origine aux marchés étrangers concernés. Cet effet est robuste à des différentes spécifications, à l'utilisation des différentes variables instrumentales et approches économétriques.

Mots-clefs : commerce international, grande distribution

Classification JEL : F10, F12, F14, F23

Multinational Retailers and Home Country Exports

1 Introduction

Retail sales in emerging countries have known a striking increase since the end of the 20th century. For example, between 2000 and 2010 the total retail sales of grocery products on the Chinese market grew from 3 to 35 billion dollars, and from 9 to 33 billion dollars on the Brazilian market. This phenomenon is likely to persist since these retail markets are far from being saturated (for comparison, grocery retail sales in France amount to USD 186 billion). Retail sales in developing and emerging countries are concentrated in the hands of a relatively small number of foreign companies, all characterized by a strong overseas expansion during the last decade. Nowadays 26% of retailers' sales are made on foreign markets.

The internationalization of retail companies may shape international trade in multiple ways. In the current paper we analyze to what extend a country's exports of food products to a specific market are impacted by the entry of domestic retailers on that market. We show that the overseas expansion of a country's retailers fosters its exports to concerned foreign markets by reducing trade costs for origin country suppliers and by modifying the preferences of host country consumers.

The effects of multinational retailers on international trade have only recently been explored in the literature and related works remain scarce. Head, Jing, and Swenson [2010] analyze how multinational retailer presence influences host country exports. Their analysis draws on the Chinese city-level exports of retail goods and the geographic expansion (in China and at the global level) of world's four largest retailers. They find evidence of a positive impact on the export capabilities of local suppliers. Nordås, Grosso, and Pinali [2008] use a case study analysis to study how the arrival of multinational retailers shape host country exports. They separate food from non-food products and confirm the existence of a positive effect on host country exports to retailers' origin country.

Our work is closely linked to the recent strand of international trade literature evaluating the role of intermediaries [Antràs and Costinot, 2010; Bernard, Jensen, Redding, and Schott, 2010; Blum, Claro, and Horstmann, 2010; Ahn, Khandelwal, and Wei, 2011; Antràs and Costinot, 2011; Crozet, Lalanne, and Poncet, 2010]. It is important to note that most of these works refer to wholesale companies, although the term "retailer" is also employed. Although this literature regards retailers as trade intermediaries, their trade patterns differ significantly from those of wholesalers. Contrary to wholesalers, retail companies are not specialized in trade, but aim at selling final goods to consumers. This activity may lead them to reshape international trade directly or indirectly. Consequently, the different models and conclusions drawn by this literature that mainly deals with wholesalers, do not stand as well for retailers. More broadly,

our paper is also related to research in the field of foreign direct investment (FDI). A recent strand of this wide literature investigates the internationalization of major world retailers and extrapolates the classical results to the retail sector [Javorcik and Li, 2008; Javorcik, Keller, and Tybout, 2008; Iacovone, Javorcik, Keller, and Tybout, 2011].

The current paper questions the existence of a causality effect between the expansion of retailers' activities beyond their domestic market and the exports of their origin countries in the food sector. We investigates this relationship empirically using data on bilateral exports for a large panel of countries and data on the sales of the top 100 world's retailers over the 2000-2010 decade. We restrict our analysis to food trade, as these products are the main goods sold in supermarkets. The contribution of the paper is threefold. First, we ask and answer a new question that, to our knowledge, has not been considered in the literature. Secondly, we use an original dataset of retail sales of grocery products disaggregated by the country of sales and by the nationality of retailers. Third, we propose an original instrumental variable approach in order to control for the simultaneity/endogeneity bias induced by the fact that both bilateral exports and retailers' sales have a number of common observed and non-observed factors. We compare the traditional instrumental-variables approach used in most of the empirical trade literature to the approach suggested by Wooldridge [2001, 2010] and relying on generated instruments.

We find confirmation of a positive effect of the operations on foreign markets of a country's retailers on the country's exports to these markets. This outcome is far from being trivial, because most of retailers' foreign sales consist of locally-produced goods. It suggests that the dynamics of international retail companies constitutes a competitive advantage of domestic food industries. This conclusion mitigates the classical critics of the retail sector concerning the pressure on their suppliers and the food industry.

The paper is structured as follows. The next section presents stylized facts relative to the world's largest retail companies and their operations on foreign markets. We emphasize that emerging economies (Brazil, India and China) are among the most dynamics markets in terms of growth of foreign retailers' sales. The empirical model, based on gravity, is detailed in section 3. Employed data, adopted econometric approaches and main results are discussed in section 4. We pay particular attention to dealing with endogeneity aspects in order to validate the positive and significant role of multinational retail investment on trade. The last section resumes our conclusions.

2 Stylized facts

Retail sales of grocery more than doubled between 2000 and 2010.[1] This raise was particularly high in developing countries (+ 220% of sales) and in the main four emerging countries (Brazil, Russia, India and China - abbreviated BRIC), with a 526% increase. Population and income growth, especially in emerging countries, together with changes in consumption habits, are at the origin of this recent expansion of retail chains [Evans, Bridson, Byrom, and Medway, 2008; Reardon, Timmer, Barrett, and Berdegue, 2003]. The increasing liberalization of the retail sector in developing and emerging countries, especially in India, and the remaining low share of retail in total grocery expenditures of households in these countries (Figure 1) suggest that this trend will continue in the years to come.

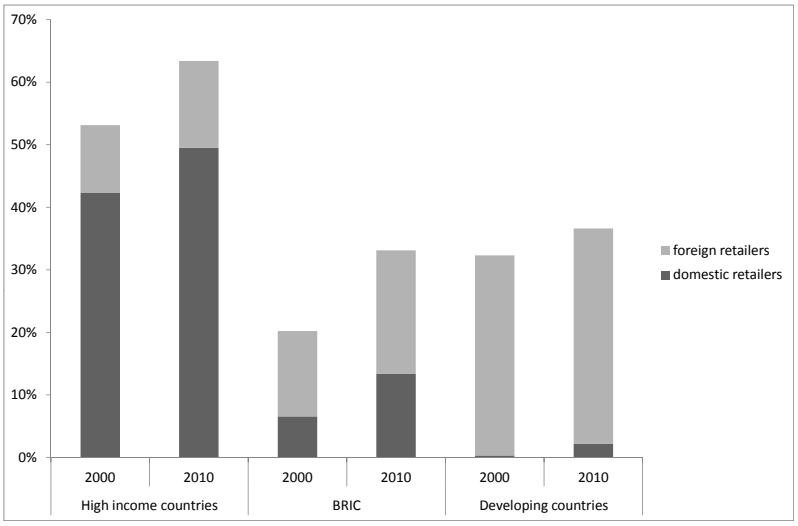

Figure 1: The share of "modern" retail in total grocery expenditures of households, by countries

Source: Authors' calculation using data from Planet Retail.

The expansion of the retail sector benefited mainly to multinational retail companies. Thus, as we can observe from Figure 1, in 2010 94% of retail sales in developing countries and 60% in BRIC countries were made in foreign-owned retail chains. The internationalization of retail companies is not a recent phenomenon. The leading French retail company Carrefour established its first foreign outlet in Belgium in 1969, while Wal-mart entered the Mexican

[1] This observation is based on data from the Planet Retail, a database that provides data on the sales of world's top one hundred retailers in domestic and foreign markets, at company level, since 2000. The retail sector being highly concentrated [Reardon, Timmer, Barrett, and Berdegue, 2003], we can consider our dataset as almost exhaustive. The origin, or the nationality, of retail companies were added using information available on companies' websites. Mergers and acquisitions are taken into account only if they imply a change of the name of outlets. For each firm we consider only one origin country.

market in 1991. However, foreign investment in the retail sector experienced an acceleration during the last decade, mainly due to the rapid development of the retail market in developing and emerging countries and to the saturation of retailers' domestic markets. Sales made on foreign markets by multinational retailers raised by 144% between 2000 and 2010, against only 110% for domestic sales.

The Figure 2 displays the sales of retailers, differentiated by their country of origin, on domestic and foreign markets. According to our data, the internationalization of the retail sector concerns companies of few geographical origins. The overall leading position of American retail companies (27% of sales in the global retail sector) is due essentially to the US domestic market. Indeed, only 9 out of the 21 American retailers in the database, including Wal-mart – the world's largest retailer, have outlets in foreign markets. Sales in foreign markets represent as low as 17% of American retailers' total sales. Differently, German and French retail companies make over 40% of their total sales on foreign markets (see Table 3 of the Appendix for detailed data). Given the size of these companies,[2] this leads to the fact that almost half of the sector's global sales in foreign markets are in outlets owned by German and French retailers. The retailers from Netherlands, Belgium and Hong Kong have the highest degree of internationalization: over 60% of their turnover (total sales) comes from abroad. This is reflected in Figure 2 by the points lying most closely to the horisontal axis. On the other extreme we have Canadian, Italien and Spanish retailers who sell almost exclusively on the domestic market.

Figure 2: Sales of retailers in 2010, by main country of origin, in billion USD

Source: Authors' calculation using data from Planet Retail.

[2]French retailers account for 16% of the world market and German retailers for 15%. The global market is defined here as the sum of sales by the world's largest 100 retailers.

A geographical specialization is also observed in terms of the host countries targeted by different multinational retailers (Figure 3). Thus, most of the foreign outlets of retailers from Germany, Belgium and the Netherlands are located in European high income countries. On the contrary, a large share of the foreign activity of French and American companies' is concentrated in BRIC and other developing countries. In particular, Brazil and China constitute two strategic markets for French retailers, absorbing 19 and respectively 7% of their foreign sales. US retailers are also very active on the Brazilian and Chinese markets, even though sales in the neighbor Mexican market account for 20% of their foreign sales.

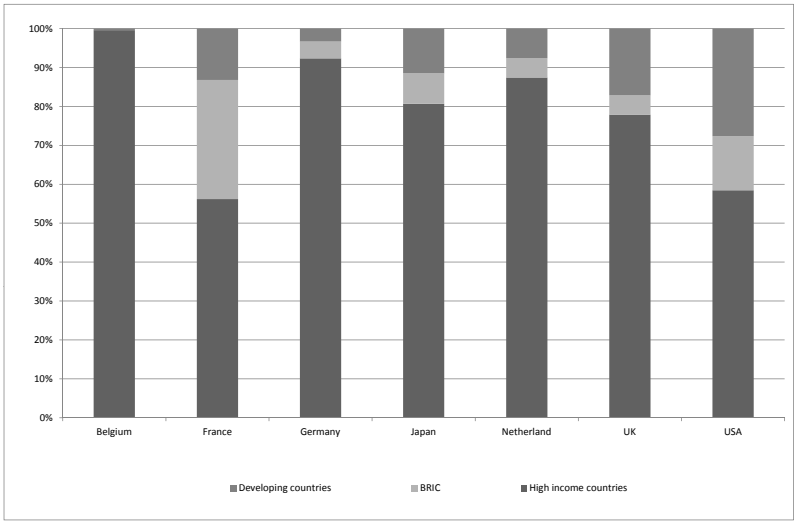

Figure 3: Sales in foreign markets, by country of origin of retailers in 2010

Source: Authors' calculation using data from Planet Retail.

This geographical specialization is also reflected in the share of the local market attributed to retailers from different origins (Figure 4). German companies are the main retailers in Kazakhstan (where they have 100% of the local market), Bulgaria (96%), Croatia (85%) and Ukraine (80%). French companies are the only foreign retailers in Jordan, Lebanon, Saudi Arabia, Senegal, and have the highest shares of the Brazilian (66%) and Chinese markets (24%). The foreign outlets of American retailers are concentrated mainly in South and Central American countries. Next, we question whether these geographically diversified foreign investments of multinational retailers constitute an advantage for the exports of their origin countries.

3 The empirical model

We consider a trade structure with a differentiated good of n_i varieties produced in each country i. Product differentiation is at country level. Consumer preferences are homothetic and repre-

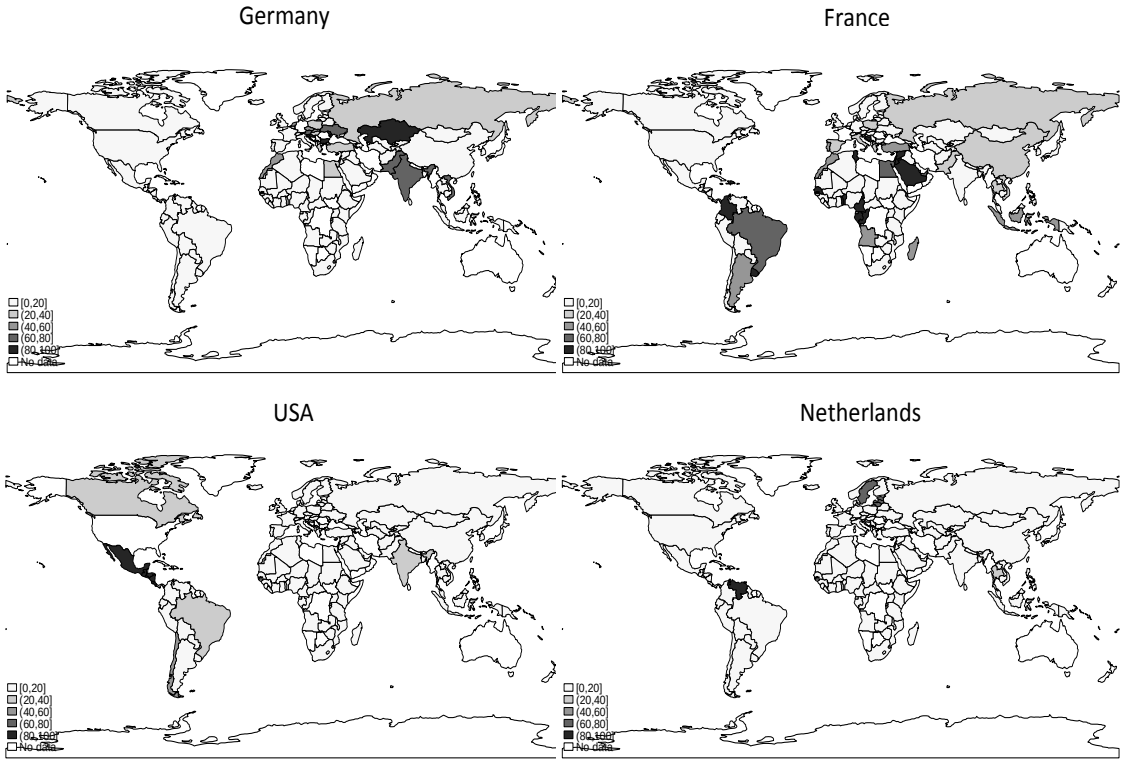

Figure 4: Retailers' market shares in 2010

Source: Authors' calculation using data from Planet Retail.

sented 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 of a good produced in country i for consumers in j, p_{ij}, is the product of its mill price $p_{i,t}$ and the corresponding trade cost τ_{ij}. Consumers of each country j spend a total amount E_j on domestic and foreign products and choose quantities that maximize their utility function under the budget constraint. Country j's overall demand for products from origin i is expressed as:

$$m_{ij} = a_{ij}^{\sigma-1} \left(\frac{p_i \tau_{ij}}{P_j} \right)^{1-\sigma} n_i E_j, \tag{1}$$

where P_j is a non-linear (CES) price index of country j imports, depending on the elasticity of substitution σ and the bilateral preference parameter a_{ij}. Under market clearance, the exporter-specific part of equation (1) can be expressed as the country's production Y_i adjusted by a non-linear average cost Π_{ij} of shipping its products to the global market: $n_i p_i^{1-\sigma} = Y_i \Pi_i^{\sigma-1}$.[3] Using this assumption, Anderson and van Wincoop [2003, 2004] show that the importer price

[3]The market clearing assumption implies that a country's production equals the sum of its exports to all destinations, including the domestic market, $Y_i = \sum_j m_{ij}$, and is verified for aggregate data.

index P_j reflects as well the average importing cost of country j from all origins combined. Trade equation (1) becomes then:

$$m_{ij,t} = \left(\frac{\tau_{ij,t}}{a_{ij}}\right)^{1-\sigma} Y_{i,t}\Pi_{i,t}^{\sigma-1}E_{j,t}P_{j,t}^{\sigma-1}. \tag{2}$$

We add subscript t to reflect the time dimension of variables. In the literature, $\Pi_{i,t}$ and $P_{j,t}$ are referred to as the outward and inward multilateral resistances.[4] The non-linearity of these terms and the presence of bilateral preference parameters a_{ij} make virtually impossible the estimation of equation (2) in its structural form without additional simplifying assumptions.

Consumer preferences can be expressed as a function of observables, just like trade costs. However, we have no means to disentangle the impact of a variable on preference parameters from its impact on trade costs. Therefore, estimated coefficients on any exogenous component of trade costs or preferences will actually capture the global effect of these variables on both trade costs and consumer preferences. Throughout the rest of the paper we consider preference-adjusted trade costs and interpret any increase in the term $\tau_{ij,t}/a_{ij}$ as an increase of trade costs. An alternative interpretation of preference parameters is 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 taste for good s leads consumers to overvalue the virtues of the product and shifts their demand function upward. Thus, the actual price to which consumers in country j respond is $p_{sj,t}/a_{sj}$ rather than $p_{sj,t}$.

One can estimate directly equation (2) in logarithmic form with time-varying importer and exporter fixed effects after grouping i and j terms:[5]

$$\ln m_{ij,t} = \ln Y_{i,t} + FE_i + \ln E_{j,t} + FM_j + (1-\sigma)\ln\frac{\tau_{ij,t}}{a_{ij}} \tag{3}$$

We assume that multilateral resistances do not vary significantly over time and use time-invariant exporter and importer fixed effects to estimate (3).[6] This permits us to explore the time-varying dimension of countries' production and consumption levels and to take advantage of the panel structure of our data.

We adopt a preference-adjusted trade costs function which includes the standard proxy variables found in the literature, some innovative factors, and a zero-mean randomly distributed error term

[4] More specifically, $\Pi_{i,t} = \sum_j \left(\frac{\tau_{ij,t}}{a_{ij}}\right)^{1-\sigma} E_{j,t}P_{j,t}^{\sigma-1}$ and $P_{j,t} = \sum_i \left(\frac{\tau_{ij,t}}{a_{ij}}\right)^{1-\sigma} Y_{i,t}\Pi_{i,t}^{\sigma-1}$.

[5] Rose and van Wincoop [2001] and Redding and Venables [2004] use country-specific effects in a cross-section setting to capture the exporter- and importer-specific variables of a trade equation. Estimating the non-linear system formed by trade equation (2) and equations defining remoteness terms $\Pi_{i,t}$ and $P_{j,t}$ requires additional constraints ensuring that the system has a single solution, such as symmetric trade costs in Anderson and van Wincoop [2003, 2004]. We particularly wand to avoid making such constraints in the present study and therefore adopt the fixed-effects estimation approach.

[6] This assumption does not seem very strong for a time period of one decade.

$e_{ij,t}$:

$$\begin{aligned}\ln \frac{\tau_{ij,t}}{a_{ij}} &= b_1 \ln dist_{ij} + b_2 contig_{ij} + b_3 colony_{ij} + b_4 RTA_{ij,t} + b_5 UNvotes_{ij,t} \\ &\quad + b_6 \ln NonFoodTrade_{ij,t} + \ln\left(1 + \textit{tariff}_{ij,t}\right) + c \ln SALES_{ij,t} + e_{ij,t}\end{aligned} \tag{4}$$

Variable $dist_{ij}$ represents the physical distance separating countries i and j. It increases trade costs and we expect the data to confirm that $b_1 > 0$. Variables $contig_{ij}$, $colony_{ij}$ and $RTA_{ij,t}$ denote respectively a common land border a common colonial history and the membership to the same Regional Trade Agreement (RTA) for countries i and j. These variables diminish trade costs and facilitate trade and, therefore, we expect coefficients b_2 – b_4 to be negative. Variable $UNvotes_{ij,t}$ corresponds to an affinity index between countries i and j, computed by Strezhnev and Voeten [2013] using their votes in the United Nation General Assembly. $NonFoodTrade_{ij,t}$ is the amount of bilateral trade in non food products exchanged between i and j. The inclusion of the last two variables aims at capturing the bilateral preferences linking the the two countries, anticipating negative values for parameters b_5 and b_6. Import tariffs $\textit{tariff}_{ij,t}$ are expressed as ad-valorem equivalents and enter the trade costs function (4) with a unitary coefficient. The last term $SALES_{ij,t}$ reflects the sales of domestic and foreign grocery products by multinational retailers from country i in their outlets established in host market j.
The trade equation to be estimated is obtained by integrating the trade costs function (4) in equation (3) and using importer and exporter gross domestic products (GDP) as proxies for production and expenditure levels:

$$\begin{aligned}\ln m_{ij,t} &= \alpha_1 GDP_{i,t} + \alpha_2 GDP_{j,t} + \beta_1 \ln dist_{ij} + \beta_2 contig_{ij} + \beta_3 colony_{ij} + \beta_4 RTA_{ij,t} \\ &\quad + \beta_5 UNvotes_{ij,t} + \beta_6 \ln NonFoodTrade_{ij,t} + (1-\sigma) \ln\left(1 + \textit{tariff}_{ij,t}\right) \\ &\quad + \gamma \ln SALES_{ij,t} + FE_i + FM_j + \varepsilon_{ij,t}.\end{aligned} \tag{5}$$

The rest of the paper is dedicated to the estimation of parameters in equation (5), special attention being devoted to the impact of retailers' foreign sales (parameter γ).

4 Retailers' overseas expansion and home country 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 decade. The main variable of interest of our analysis is $SALES_{ij,t}$, which corresponds to the total sales of all retailers from country i in outlets established in host market j. We compute this variable using data from Planet Retail[7], the database used for computing the descriptive statistics in section 2. The origi-

[7] http://www1.planetretail.net/

nal database records the grocery sales of the world's top one hundred individual retail companies in each country. We aggregated the data by the origin country of retailers and obtain the sales volume of all retailers from each country i in each host market j.[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 importing countries familiar with retailing, i.e. that host at least one foreign or domestic retailer. Even doing so, the observations with positive sales of multinational retailers in foreign markets represent only 2.3% of the dataset.

For trade data, we use the BACI database developed by the CEPII.[9] BACI trade data are produced at a high level of product disaggregation: at the 6-digit level of the Harmonized System (HS) nomenclature. We select food products sold in supermarkets,[10], aggregated trade data across products, and end up with a single trade value for each pair of exporting and importing countries.

Countries' GDPs are taken from the World Development Indicators database of the World Bank. Variables corresponding to the geographical and historical links ($dist$, $contig$, $colony$) come from the CEPII's geodist database.[11] The participation to RTA and import tariffs are from the MAcMap-HS6 dataset, the latter variable begin available only for three years of our sample: 2001, 2004 and 2007.[12] The MAcMap database gives ad-valorem equivalents of tariff protection for each importer, exporter and product defined at the 6-digit level of the HS nomenclature. We aggregate tariff data across the food products included in our trade variable and using world trade at the HS 6-digit level as weights, to obtain the average level of protection for each country pair and year.

The affinity index between the importing and exporting countries is the Affinity of Nations index of similarity computed by Strezhnev and Voeten [2013] using countries' roll-call voting in the United Nations General Assembly. The index is computed using three-category vote data (approval, abstain, or disapproval for an issue) and ranges from -1 to 1. A value close to -1 indicates a negative correlation between the votes of the two countries and is interpreted as an absence of common interests. Inversely, an index approaching 1 indicates a strong positive correlation between countries' UN votes and very similar national interests. Non-food trade corresponds to the sum of imports and exports in all products except HS chapters 1 to 24 between the two countries, and is computed using BACI data.

[8] See section 2 for details.

[9] Gaulier and Zignago [2010] This database uses original procedures to harmonize the United Nations COMTRADE data: e.g. evaluation of the quality of countries' declarations to average mirror flows; evaluation of cost, insurance and freight (CIF) rates to reconcile import and export declarations.

[10] Of 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).

[11] Mayer and Zignago [2011].

[12] See Guimbard, Jean, Mimouni, and Pichot [2012] for a description of the dataset.

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 of i to j. A positive sign parameter $gamma$ in equation (5) would suggest that the foreign activity of retailers improves the export performance of their origin country on the respective foreign markets. However, the sales in country j of retailers based in country i, $SALES_{ij,t}$, and the bilateral exports to j of all firms from i, $m_{ij,t}$, have a common set of observed and non-observed determinants. Both exports and retail investments increase with the economic size of the destination country, the presence of cultural, linguistic and historical ties between the origin and destination countries. The simultaneous determination of the two variables is a potential source of endogeneity. Estimating equation (5) directly with ordinary least squares (OLS), therefore, may yield biased results.

To eliminate this endogeneity bias and obtain a correct estimation of the causality effect between variables $SALES_{ij,t}$ and $m_{ij,t}$, we use an instrumental variable approach. We identify two exogenous variables that affect the decision of a retail company to invest abroad or the amount of sales in its outlets located abroad, but not the volume of bilateral exports between its origin and host countries. First, we consider the purchases in "modern" retail stores of households from the host (importing) country, expressed as a share of their overall grocery expenditures. By "modern" retail stores we mean the outlets of large retail chains, in opposition to traditional – usually one-outlet family-run – small retailers. We associate a large share of the host country's modern retailing to a high volume of sales by foreign retailers and vice versa. The less developed is a country's modern retail sector, the larger are the efforts of arriving foreign retail companies to attract local consumers. In addition to the usual efforts of acquiring customers, multinational retailers need to convince local households to purchase their groceries in new, different, unfamiliar retail structures (i.e. change their purchasing habits). The second instrument we employ is the domestic market share of origin country retailers. We make the assumption that retail companies are more eager to sell abroad when they already have a high share of the domestic (origin country) market. Retailers expand overseas in their quest for new consumers [Reardon, Timmer, Barrett, and Berdegue, 2003]. A larger domestic market share of a country's retailers rhythms with more bounded growth opportunities on this market. Therefore, entering new markets becomes the retailers' main strategy for expanding their activities. Both instruments are computed using data from Planet Retail. To take into account the bilateral dimension of our data, we consider the product of these two variable as a third instrument. To reduce endogeneity, we use lagged values (by one year, in $t-1$) of all our instruments.

The three instrumental variables described above, let us denote them by vector $Z_{ij,t-1}$, can be used untransformed 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 addi-

tion to it, we consider two other 2SLS estimators that take into account the specific distribution of the instrumented variable $SALES_{ij,t}$. Variable $SALES_{ij,t}$ 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 relatively scarce at the global level, even when we limit the data panel to importing countries that host at least one retailer. Rather than using directly $Z_{ij,t-1}$ to control for the endogeneity of retailers' sales in foreign markets, we employ transformations $f(.)$ of these variables that take into account the partially-continuous and partially-discrete distribution of variable $SALES_{ij,t}$. Following Wooldridge [2010][p.117], we compute $f(.)$ as the best prediction of $SALES_{ij,t}$ obtained with the vector of exogenous variables in equation (5), $X_{ij,t}$, and our set of instrumental variables $Z_{ij,t-1}$: $f(Z_{ij,t}) = E(SALES_{ij,t}|X_{ij,t}, Z_{ij,t-1})$. First, we assume that variable $SALES_{ij,t}$ follows a standard Tobit model and use the corresponding maximum likelihood estimator to compute $f(Z_{ij,t})$. Second, we use a Heckman estimator that allows $Z_{ij,t-1}$ to affect differently the occurrence (the discrete part) and the volume (the continuous part) of retailers' sales in foreign markets $SALES_{ij,t}$. In this estimation, the cost of registering a property in the host country, expressed as a percentage of the property value, is used as the selection variable in the Heckman procedure.[13] Variables $f^T(Z_{ij,t})$ and $f^H(Z_{ij,t})$, generated respectively with Tobit and Heckman estimators, are used alternatively instead of $Z_{ij,t-1}$ in a two-stage least squares procedure to estimate the equation (5) coefficients.
Another difficulty in our estimations is the fact that country and partner fixed effects explain by themselves a large share of observations with zero-value retail sales. To overcome this situation, we replace country-specific importer and exporter effects with region-specific effects (listed in Table 4 of the Appendix). The fact that geographical areas are exogenously defined (contrary to groups defined by income levels, etc.) and that countries within each geographical area face comparable trade costs (due to their geographic proximity and the large number of regional trade agreements) underpins this approach.

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 1 shows the estimates of coefficients in equation (5) using six 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, non food trade, the affinity index, and dichotomous variables for common land border, past colonial ties and RTA membership are used to account for unobservable bilateral trade costs and preferences. Import tariff data cover only three years of our sample, i.e. less than 30% of the total number of observations. Therefore, in the first five columns of Table 1 we drop this variable from our estimations. The

[13]Data on the cost of registering a property are from the World Bank's Doing Business database: http://doingbusiness.org/ .

main variable of interest for our study is $SALES_{ij,t}$, the sales of retailers in foreign markets. Its coefficient indicates whether an increase in the sales of a country's retailers in a foreign market allows other firms from the same origin to export more (and at lower costs) to these destinations. Importer and exporter fixed effects for twelve 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 1. 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, the existence of a common colonial history or RTA, the value of non food trade and the similarity of votes in the United Nations enhance bilateral exports of food products. 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. In column (2), equation (5) is estimated with OLS, on the sample for which instrumental variables are available. Restricting the number of observations do not change the coefficients of the different variables.

The third column shows coefficients obtained with the standard two-stage least squares (2SLS) estimator. Both Wu-Hausman F and Durbin-Wu-Hausman χ^2 tests are highly significant, confirming the endogeneity of our variable of interest, $SALES_{ij,t}$. 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 $SALES_{ij,t}$ increases by more than tenfold from 0.03 to 0.26. This result suggests than a ten percent increase in the sales volume of a country's retailers in a foreign market would induce a 2.6 percent increase in the exports of the country's firms to this market. The impact on exports of other variables remains almost unchanged.

The next two columns of Table 1 correspond to 2SLS estimates, where the endogeneity of $SALES_{ij,t}$ is controlled for with instruments generated using first-stage Tobit and, respectively, Heckman estimators.[14] The magnitude of the effect of variable $SALES_{ij,t}$ on the exports of country i to destination j estimated with these two methods is very similar to the one obtained in column (2).

In column (6) we replicate the 2SLS estimates from column (2) on equation (5) including import tariffs.[15] we obtain a negative and highly significant coefficient on this variable, in accordance with the existing theoretical and empirical literature. Recall that import tariffs enter the trade costs function with coefficient one. Therefore, the tariff coefficient in column (6) allows us to deduce the magnitude of the elasticity of substitution between exchanged products: $\sigma = 2.25$. The impact of variable $SALES_{ij,t}$ on bilateral exports is very similar to the ones obtained with the other 2SLS estimators.

[14]Using Heckman estimator reduces our estimation panel by more than half. This is due to the fact that data on administrative costs of establishing a new business exist only from 2005.

[15]Due to the limited availability of data on administrative costs of establishing a new business and on import tariffs, results in column (5) of Table 1 correspond only to observations for the year 2007.

Table 1: The impact of multinational retailers' sales in foreign markets on home country exports

	Explained variables: $\ln m_{ij,t}$					
	OLS		2SLS, instrumental variables:			
			$Z_{ij,t-1}$	$f^T(Z_{ij,t-1})$	$f^H(Z_{ij,t-1})$	$Z_{ij,t-1}$
	(1)	(2)	(3)	(4)	(5)	(6)
ln GDP exporter	0.57***	0.55***	0.47***	0.48***	0.50***	0.49***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
ln GDP importer	0.43***	0.43***	0.41***	0.41***	0.35***	0.45***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
ln distance	-0.72***	-0.71***	-0.63***	-0.64***	-0.56***	-0.66***
	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
contiguity	0.64***	0.62***	0.42***	0.44***	0.49***	0.42***
	(0.05)	(0.05)	(0.06)	(0.06)	(0.08)	(0.1)
colony	1.27***	1.21***	0.94***	0.97***	0.87***	1.04***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.10)
RTA	0.36***	0.36***	0.36***	0.36***	0.39***	0.21***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.04)
UN votes similarity index	0.07**	0.08***	0.10***	0.10***	0.01	0.18***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.05)	(0.06)
ln non food trade	0.34***	0.33***	0.33***	0.33***	0.38***	0.32***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
ln retailers' sales	0.03***	0.03***	0.20***	0.18***	0.15***	0.16***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.02)	(0.02)
ln (1+tariff)						-1.25***
						(0.13)
Nb obs.	92542	78297	78297	78297	39581	21481
R^2, centered	0.54	0.53	0.51	0.52	0.53	0.52
R^2, uncentered			0.91	0.91	0.91	0.92
Sargan statistic			2.48			0.45
Sargan p-value			0.289			0.800
F stat weak identification			1748.52	5475.1	2091.48	518.66
LM test underidentification			4918.72	5119.77	1988.13	1453.22
underidentification p-value			0.000	0.000	0.000	0.000
ln likelihood	-212333.8	-176898.59	-178470.34	-178135.59	-91380.12	-48371.91

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Estimations in all columns include a fixed effect for each year, each exporting and each importing geographic zone. Instruments $Z_{ij,t-1}$ are the share of "modern" retail in the grocery expenditure of host country households, the share of origin country retailers on their domestic market, and the products of these two variables. Instruments $f^H(Z_{ij,t-1})$ and $Z_{ij,t-1}$ are the best predictions of retailers' sales with all the model's exogenous variables, using Tobit and Heckman estimators, respectively. See the text for details. The test for weak identification is an F version of the Cragg-Donald Wald statistic. The test for underidentification is an LM version of the Anderson canonical correlations test.

One could argue that the positive effect of retailers' sales in Table 1 could be the result of an upward shift in the price of exported goods. An increase in the foreign activity of a country's retailers may help domestic firms to export their products at higher prices, or to export larger amounts of high quality (and consequently high-priced) products. To analyze the issue of possible price effects, in Table 5 of the Appendix we replicate estimates from Table 1 on exported quantities (expressed in tonnes). We find a positive and significant effect of retailers' foreign

sales in all specifications. In terms of magnitude, roughly half of the effect on exported values (Table 1) is explained by the effect on quantities (Table 5), with the other half being driven by price effects.

To sum up, results presented in Tables 1 and 5 testify that foreign retail investment fosters the exports of origin country producers. Taking into account endogeneity enhances this effect. Different economic mechanisms may explain this outcome. In our empirical model (section 2) we assume that $SALES_{ij,t}$, the sales of retailers of country i in the host country j enter in the preference-adjusted trade cost function (equation 4). Following this empirical framework, foreign retail investment may impact trade through two channels, a reduction of bilateral *trade costs* for the origin country's exporters and a modification of *preferences* of the consumers of the host country.

The implantation of a retail company in a host country may reduce *trade costs* for suppliers of domestic retail stores. Indeed, retailers that penetrate foreign markets may continue to source from domestic suppliers for their overseas stores (at least at the beginning). The access to retailers' network of overseas outlets would permit to these domestic suppliers to avoid some of the regular sunk costs for entering foreign markets (e.g. searching foreign partners, learning about foreign regulation and consumer preferences) and to face lower variable costs for selling their goods abroad (e.g. group exports with other domestic suppliers of the same retailer to lower transport and distribution costs). Suppliers of retail brands should be the main beneficiaries of the overseas retail network, as they are involved in specific contract with the retail company.

The multinational retail investment may also induce a reduction of *trade cost* for all domestic food exporters by generating information spillovers. The successful entry of a retailer on a foreign market signals to other domestic firms the potential for increased sales and profits on that market. In addition, these other food exporters may benefit from scale economies in transportation.

The implementation of retail companies may also induce a modification of consumer's *preferences*. Indeed, retailers adapt their offer to the markets they enter, but they also introduce new products. Due to their large size, continuous presence and repeated contact with local customers, they may accustom the latter to their origin country consumption culture and life style, and thereby shift demand. For example, the rising Chinese demand for wines may be correlated to the fact that Chinese consumers have access to French wines in Carrefour outlets in China. This modification of consumer taste may not only benefits to national retail suppliers, but also to all national and foreign exporters of these products. Moreover, a multinational retailer can also publicize a good image of its country of origin, which may be translated in the end into a higher local demand for products of this origin.

Finally, the implementation of retailers in developing countries is concomitant with an increase of processed food consumption (Veeck and Burns [2005]). Increased income and demands on time both explain this change in *consumption habits* and benefit to all processed food exporters. This context also contributes to the positive impact of overseas retailers' implementation on

bilateral trade.

4.4 Robustness of results

4.4.1 Different instrumental variables

As a robustness check, we estimate equation (5) with three sets of alternative instrumental variables. To instrument $SALES_{ij,t}$, we first use the share of household with female head [16] and the share of origin country retailers in their domestic market, computed using the Planet retail database. In a second estimation, instruments are the cost of starting a new business in the host country[17] and the number of retail companies in the origin country (planet retail). Finally, we use as instrument the index of regulation in the retail sector of the host country proposed by the OECD and the share of origin country retailers in their domestic market.[18] The index of regulation aims at synthesizing conditions in retail distribution sectors, taking into account barriers to entry, operational restrictions, and price controls. As previously, we use cross variables as a third instrument, in order to have bilateral instruments and variables are lagged. The results, presented in annex, in table 6, are robust to these new specifications.

4.4.2 Approximations of multilateral resistances

In section 4.3 we used importer and exporter fixed effects to control for multilateral resistance terms. Here, instead of fixed effects, we use approximations of these terms compatible with their definition in theoretical trade models. If one could measure directly multilateral resistances $P_{j,t}$ and $\Pi_{i,t}$ in equation (2), estimating the impact of different trade costs elements on the volume of trade would become straightforward and would no require the use of exporter and importer fixed effects.

The computation of multilateral resistances, as defined by the theoretical model,[19] requires the use of unknown parameters (the elasticity of substitution σ and the coefficients of the trade costs equation (4)) and cannot be achieved directly with observed data. As a result, a variety of ad-hoc formulas emerged in the empirical trade literature, but all lack consistence with the theoretical model. An improved alternative is introduced by Baier and Bergstrand [2009], who approximate multilateral resistance terms by their first-order log-linear Taylor-series expansions. This method permits to use the same trade costs function when deriving trade volumes and remoteness terms, and to directly estimate all unknown parameters. Its implementation resumes to

[16] Data from the World Development Indicators of the World Bank.

[17] Data from doing business database

[18] index of regulation in the retail sector: http://stats.oecd.org/Index.aspx?DatasetCode=RETAIL. This index is only available for a limited sample of countries (mainly OECD country and few emerging countries) and for 2003 and 2008, that explains the small number of observations in column (3).

[19] See footnote 3.

computing a bilateral remoteness term for each variable X of the trade costs function (4):

$$MR\_X_{ij,t} = \sum_j \theta_{j,t} X_{ij,t} + \sum_i \theta_{i,t} X_{ij,t} - \frac{1}{2} \sum_i \sum_j \theta_{i,t} \theta_{j,t} X_{ij,t} - \frac{1}{2} \sum_i \sum_j \theta_{i,t} \theta_{j,t} X_{ji,t}, \quad (6)$$

with parameters θ standing for countries' shares in world GDP.[20] Replacing importer and exporter fixed effects in equation (3) with the sum of multilateral resistance terms $MR\_X_{ij,t}$ given by (6) and grouping variables, we obtain a trade equation which permits the direct estimation of all parameters of our trade model:

$$\begin{aligned} \ln m_{ij,t} \;=\; & \alpha_0 + \alpha_1 GDP_{i,t} + \alpha_2 GDP_{j,t} + \beta_1 \left[\ln dist_{ij} - MR\_\ln dist_{ij}\right] \\ & + \beta_2 \left[contig_{ij} - MR\_contig_{ij}\right] + \beta_3 \left[colony_{ij} - MR\_colony_{ij}\right] \\ & + \beta_4 \left[RTA_{ij,t} - MR\_RTA_{ij,t}\right] + \beta_5 \left[UNvotes_{ij,t} - MR\_UNvotes_{ij,t}\right] \\ & + \beta_6 \left[\ln NonFoodTrade_{ij,t} - MR\_\ln NonFoodTrade_{ij,t}\right] \\ & + (1-\sigma) \left[\ln\left(1 + \textit{tariff}_{ij,t}\right) - MR\_\ln\left(1 + \textit{tariff}_{ij,t}\right)\right] \\ & + \gamma \left[\ln SALES_{ij,t} - MR\_\ln SALES_{ij,t}\right] + \epsilon_{ij,t}. \end{aligned} \quad (7)$$

We add a constant term α_0 in equation (7) to increase the flexibility of our empirical model. We estimate equation (7) with and without tariffs, according to the five approaches used in Table 1. We use the same instrumental variables as in section 4.3 to control for the endogeneity of multinational retailers' sales in foreign markets. Obtained coefficients are reported in Table 2. Each column corresponds to the econometric approach used in the column with the same number in Table 1. Again, we find a positive and significant effect of retailers' sales in a foreign market on the exports of its origin country to this market. The magnitude of the effect is very similar to that in Table 1. The coefficients of standard trade model variables in the two tables are also very close, confirming the robustness of our findings.

5 Conclusions

Retail sales have experienced a huge increase in developing countries since the beginning of the 21th century. This constitutes an important advantage for food exporters from countries with internationalized retail companies (Germany, France, USA and The Netherlands). Indeed, our results show that the implantation of a domestic retailer in a given country fosters food domestic exports to this market. Our result is robust to different specifications, the use of different sets of instrumental variables and econometric approaches.

This outcome is far from being trivial since only a small fraction of the products sold in re-

[20] The term $MR\_X_{ij,t}$ is simply the sum of importer and exporter multilateral remotenesses in Baier and Bergstrand [2009]. Because our trade costs structure includes asymmetric variables (e.g. import tariffs), we cannot further simplify equation (6) to a sum of three terms like do Baier and Bergstrand [2009].

Table 2: Robustness of impacts: multilateral remotenesses

	Explained variables: $\ln m_{ij,t}$					
	OLS		2SLS, instrumental variables:			
			$Z_{ij,t-1}$	$f^T(Z_{ij,t-1})$	$f^H(Z_{ij,t-1})$	$Z_{ij,t-1}$
	(1)	(2)	(3)	(4)	(5)	(6)
ln GDP exporter	0.89***	0.86***	0.79***	0.79***	0.84***	0.77***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
ln GDP importer	0.77***	0.75***	0.72***	0.72***	0.72***	0.74***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ln distance	-0.97***	-0.94***	-0.89***	-0.89***	-0.87***	-0.90***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
contiguity	0.47***	0.46***	0.25***	0.27***	0.34***	0.27**
	(0.05)	(0.06)	(0.06)	(0.06)	(0.08)	(0.11)
colony	0.77***	0.75***	0.69***	0.70***	0.72***	0.70***
	(0.05)	(0.05)	(0.06)	(0.06)	(0.07)	(0.10)
RTA	0.62***	0.62***	0.59***	0.59***	0.66***	0.46***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.05)
UN votes similarity index	-0.83***	-0.70***	-0.62***	-0.63***	-0.63***	-0.52***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.06)
ln non food trade	0.14***	0.14***	0.13***	0.13***	0.15***	0.11***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
ln retailers' sales	0.05***	0.05***	0.23***	0.22***	0.20***	0.22***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.02)	(0.02)
ln (1+tariff)						-0.42**
						(0.17)
Nb obs.	92584	78312	78312	78312	49790	21482
R^2, centered	0.46	0.44	0.42	0.42	0.42	0.42
R^2, uncentered			0.90	0.90	0.89	0.90
Sargan statistic			205.73	0.00	0.00	41.85
Sargan p-value			0.000			0.000
F stat weak identification			1614.44	4951.15	2864.69	450.60
LM test underidentification			4562.38	4657.79	2709.61	1272.60
underidentification p-value			0.000	0.000	0.000	0.000
ln likelihood	-220461.49	-183568.29	-185311.53	-185025.74	-119391.29	-50427.20

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Estimations in all columns include year fixed effects. Instruments $Z_{ij,t-1}$ are the share of "modern" retail in the grocery expenditure of host country households, the share of origin country retailers on their domestic market, and the products of these two variables. Instruments $f^H(Z_{ij,t-1})$ and $Z_{ij,t-1}$ are the best predictions of retailers' sales with all the model's exogenous variables, using Tobit and Heckman estimators, respectively. Explanatory variables ln $distance$, $colony$, $contiguity$, and ln $\left(1 + tariff_{ij,t}\right)$ are transformations of original variables as in equation (7). See the text for details. The test for weak identification is an F version of the Cragg-Donald Wald statistic. The test for underidentification is an LM version of the Anderson canonical correlations test.

tailers' foreign outlets are from their origin country. Indeed, the bulk of retailers' foreign sales are locally produced goods. Two economic mechanisms may explain this finding. First, the overseas presence of a country's retail companies contributes to a reduction of trade costs towards these markets. Second, the establishment of outlets in a foreign country induces potential changes in consumption habits in favor of products from retailers' origin country. Nevertheless, our analysis does not permit to disentangle the role of trade costs reduction from that of consumer preferences changes.

Further research is needed to evaluate the relative importance of these two channels. The effect

of trade cost reduction on export performance of food producers due to overseas expansion of retailers can be done using firm level data analysis. This will allow to measure the impact of the retailer foreign network distinguishing between suppliers of retailers from other exporters.

References

AHN, J., A. K. KHANDELWAL, AND S.-J. WEI (2011): "The role of intermediaries in facilitating trade," *Journal of International Economics*, 84(1), 73–85.

ANDERSON, J. E., AND E. VAN WINCOOP (2003): "Gravity with Gravitas: A Solution to the Border Puzzle," *American Economic Review*, 93(1), 170–192.

——— (2004): "Trade Costs," *Journal of Economic Literature*, 42(3), 691–751.

ANTRÀS, P., AND A. COSTINOT (2010): "Intermediation and Economic Integration," *American Economic Review*, 100(2), 424–28.

——— (2011): "Intermediated Trade," *The Quarterly Journal of Economics*, 126(3), 1319–1374.

BAIER, S. L., AND J. H. BERGSTRAND (2009): "Bonus vetus OLS: A simple method for approximating international trade-cost effects using the gravity equation," *Journal of International Economics*, 77(1), 77–85.

BERNARD, A. B., J. B. JENSEN, S. J. REDDING, AND P. K. SCHOTT (2010): "Wholesalers and Retailers in US Trade," *American Economic Review*, 100(2), 408–13.

BLUM, B. S., S. CLARO, AND I. HORSTMANN (2010): "Facts and Figures on Intermediated Trade," *American Economic Review*, 100(2), 419–23.

CROZET, M., G. LALANNE, AND S. PONCET (2010): "Wholesalers in International Trade," Working Papers 2010-31, CEPII research center.

EVANS, J., K. BRIDSON, J. BYROM, AND D. MEDWAY (2008): "Revisiting retail internationalization: Drivers, impediments and business strategy," *International Journal of Retail & Distribution Management*, 36(4), 260–280.

GAULIER, G., AND S. ZIGNAGO (2010): "BACI: International Trade Database at the Product-Level. The 1994-2007 Version," CEPII Working Paper 2010-23.

GUIMBARD, H., S. JEAN, M. MIMOUNI, AND X. PICHOT (2012): "MAcMap-HS6 2007, an exhaustive and consistent measure of applied protection in 2007," CEPII Working Paper 2012-10.

HEAD, K., R. JING, AND D. L. SWENSON (2010): "From Beijing to Bentonville: Do Multinational Retailers Link Markets?," NBER Working Paper 16288.

IACOVONE, L., B. S. JAVORCIK, W. KELLER, AND J. R. TYBOUT (2011): "Supplier Responses to Wal-Mart's Invasion of Mexico," NBER Working Paper 17204.

JAVORCIK, B., W. KELLER, AND J. TYBOUT (2008): "Openness and Industrial Response in a Wal-Mart World: A Case Study of Mexican Soaps, Detergents and Surfactant Producers," *The World Economy*, 31(12), 1558–1580.

JAVORCIK, B. S., AND Y. LI (2008): "Do the biggest aisles serve a brighter future ? global retail chains and their implications for Romania," World Bank Policy Research Working Paper 4650.

MAYER, T., AND S. ZIGNAGO (2011): "Notes on CEPII's distances measures: The GeoDist database," CEPII Working Paper 2011-25.

NORDÅS, H. K., M. G. GROSSO, AND E. PINALI (2008): "Market Structure in the Distribution Sector and Merchandise Trade," OECD Trade Policy Working Paper 68.

REARDON, T., C. P. TIMMER, C. B. BARRETT, AND J. BERDEGUE (2003): "The Rise of Supermarkets in Africa, Asia, and Latin America," *American Journal of Agricultural Economics*, 85(5), 1140–1146.

REDDING, S., AND A. J. VENABLES (2004): "Economic geography and international inequality," *Journal of International Economics*, 62(1), 53–82.

ROSE, A. K., AND E. VAN WINCOOP (2001): "National Money as a Barrier to International Trade: The Real Case for Currency Union," *American Economic Review*, 91(2), 386–390.

STREZHNEV, A., AND E. VOETEN (2013): "United Nations General Assembly Voting Data," UNF:5:NpHV5DXWPNWMWOrLGTjQYA== Erik Voeten [Distributor] V5 [Version].

VEECK, A., AND A. C. BURNS (2005): "Changing tastes: the adoption of new food choices in post-reform China," *Journal of Business Research*, 58(5), 644–652.

WOOLDRIDGE, J. M. (2001): *Econometric Analysis of Cross Section and Panel Data*, MIT Press Books. The MIT Press, 1 edn.

WOOLDRIDGE, J. M. (2010): *Econometric Analysis of Cross Section and Panel Data*, MIT Press Books. The MIT Press, 2 edn.

Appendix

Table 3: Internationalization of world's largest retailers, by country of origin, 2010

Origin country of retail companies	Sales in foreign markets (bn USD)	Share of sales in foreign markets* (%)	Share of the global market† (%)	Number of overall retail companies	Number of multi-national retailers
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.
* The degree of internationalization. † Excluding sales in domestic markets.

Table 4: Geographical area fixed effects

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

Table 5: The impact of multinational retailers' sales in foreign markets on home country export quantities

	Explained variables: $\ln m_{ij,t}$					
	OLS		2SLS, instrumental variables:			
			$Z_{ij,t-1}$	$f^T(Z_{ij,t-1})$	$f^H(Z_{ij,t-1})$	$Z_{ij,t-1}$
	(1)	(2)	(3)	(4)	(5)	(6)
ln GDP exporter	0.63***	0.60***	0.60***	0.60***	0.62***	0.61***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
ln GDP importer	0.42***	0.42***	0.42***	0.42***	0.36***	0.46***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
ln distance	-0.89***	-0.88***	-0.87***	-0.88***	-0.81***	-0.91***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
contiguity	1.03***	1.00***	0.98***	0.99***	1.06***	1.00***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.09)	-0.12
colony	1.36***	1.28***	1.26***	1.28***	1.13***	1.34***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.09)	(0.11)
RTA	0.09**	0.09***	0.10***	0.10***	-0.10*	0.19***
	(0.03)	(0.04)	(0.04)	(0.04)	(0.05)	(0.07)
UN votes similarity index	0.37***	0.36***	0.36***	0.36***	0.40***	0.34***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ln non food trade	0.37***	0.36***	0.36***	0.36***	0.41***	0.22***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.05)
ln retailers' sales	0.02***	0.02***	0.03**	0.02*	0.02	(0.00)
	(0.00)	(0.00)	(0.01)	(0.01)	(0.02)	-0.02
ln (1+tariff)						-0.93***
						-0.15
Nb obs.	93648	79059	79059	79059	40110	21703
R^2, centered	0.51	0.5	0.5	0.5	0.51	0.49
R^2, uncentered			0.88	0.88	0.88	0.89
Sargan statistic			133.62			37.61
Sargan p-value			0			0
F stat weak identification			1769.04	5532.81	2119.74	525.33
LM test underidentification			4975.81	5173.44	2014.96	1471.63
underidentification p-value			0	0	0	0
ln likelihood	-227867.85	-189051.43	-189062.05	-189052.27	-96544.76	-51646.85

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Estimations in all columns include a fixed effect for each year, each exporting and each importing geographic zone. Instruments $Z_{ij,t-1}$ are the share of women in active workers in the host country, the cost of administrative procedures supported by a foreign company when establishing a new business in the host country, and the share of origin country retailers in their domestic market. Instruments $f^H(Z_{ij,t-1})$ and $Z_{ij,t-1}$ are the best predictions of retailers' sales with all the model's exogenous variables, using Tobit and Heckman estimators, respectively. See the text for details.

Table 6: The impact of multinational retailers' sales in foreign markets on home country exports - Robustness checks using different instrumental variables

	Explained variables: $\ln m_{ij,t}$		
	(1)	(2)	(3)
ln GDP exporter	0.36***	0.35***	0.64***
	(0.04)	(0.02)	(0.03)
ln GDP importer	0.19***	0.36***	0.68***
	(0.05)	(0.01)	(0.03)
ln distance	-0.64***	-0.45***	-0.48***
	(0.07)	(0.03)	(0.06)
contiguity	0.83***	0.09	0.3
	(0.23)	(0.09)	(0.21)
colony	0.38	0.41***	1.07***
	(0.38)	(0.10)	(0.13)
RTA	0.46***	0.41***	0.32***
	(0.10)	(0.03)	(0.07)
UN votes similarity index	0.49***	0.18***	0.25**
	(0.18)	(0.05)	(0.12)
ln non food trade	0.35***	0.36***	0.28***
	(0.02)	(0.01)	(0.01)
ln retailers' sales	0.28***	0.50***	0.10***
	(0.06)	(0.04)	(0.03)
Nb obs.	3787	49501	7399
R^2, centered	0.43	0.38	0.58
R^2, uncentered	0.89	0.89	0.93
Sargan statistic	1.04	2.45	0.88
Sargan p-value	0.593	0.294	0.643
F statistic for weak identification	66.91	209.96	236.44
LM test for underidentification	192.5	622.44	649.67
underidentification p-value	0	0	0
ln likelihood	-8703.99	-120512.42	-16562

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Estimations in all columns include a fixed effect for each year, each exporting and each importing geographic zone. In column (1), instruments are the share of household with female head, the share of origin country retailers in their domestic market and the cross variable of the two. In column (2), instruments are the cost of starting a new business in the host country, the number of retail companies in the origin country and the cross variable of the two. In column (3), instruments are the index of regulation in the retail sector of the host country, the share of origin country retailers in their domestic market and the cross variable of the two.

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